2023 Annual Groundwater Monitoring and Corrective Action Report

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

Alliant Energy

SCS ENGINEERS

25223068.00 | January 31, 2024

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OVERVIEW OF CURRENT STATUS

Edgewater Generating Station, Surface Impoundments
2023 Annual Report

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

Category	Rule Requirement	Site Status
Monitoring Status – Start of Year	(i) At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Detection
Monitoring Status – End of Year	(ii) At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in §257.94 or the assessment monitoring program in §257.95;	Detection
Statistically Significant Increases (SSIs)	(iii) If it was determined that there was an SSI over background for one or more constituents listed in appendix III to this part pursuant to §257.94(e):	
	(A) Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and	<u>October 2022</u> Boron: MW-301, MW302, MW-303 Fluoride: MW-302 Sulfate: MW-301, MW-302 <u>April 2023:</u> Boron: MW-301, MW302, MW-303 Fluoride: MW-302 Sulfate: MW-301, MW-302
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	Alternative Source Demonstrations prepared for October 2022 and April 2023 events during 2023. Assessment monitoring not required.

Category	Rule Requirement	Site Status
Statistically Significant Levels (SSL) Above Groundwater Protection Standard (GPS)	(iv) If it was determined that there was an SSL above the GPS for one or more constituents listed in appendix IV to this part pursuant to §257.95(g) include all of the following:	Not applicable – Appendix IV parameter sampling not required
	(A) Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;	
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	
Selection of Remedy	(v) Whether a remedy was selected pursuant to §257.97 during the current annual reporting period, and if so, the date of remedy selection; and	Not applicable – Site is in detection monitoring
Corrective Action	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not applicable – Site is in detection monitoring

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1.0 INTRODUCTION

This 2023 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 Code of Federal Regulations (CFR) 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

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

The groundwater monitoring system at the Edgewater Generating Station (EDG) is a multiunit system. EDG has four closed CCR units, which are contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing surface CCR impoundment)

The system is designed to detect monitored constituents at the waste boundary of the CCR units as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one upgradient and three downgradient monitoring wells (**Table 1**, **Figure 1**, and **Figure 2**).

Closure of the four ponds was completed in 2021. The Notification of Completion of Closure pursuant to 40 CFR 257.102(d) was entered into the EDG CCR Operating Record on August 10, 2021.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

2.1.1 Regional Information

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. A summary of the regional hydrogeologic stratigraphy and a regional geologic cross section are included in **Appendix A**.

The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at and near the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water

source; however, several older sand wells in the area have been replaced with bedrock water supply wells. In a search of area well records, SCS Engineers (SCS) did not find any records indicating that shallow wells are still being used in the area around EDG.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity. The sedimentary sequence is underlain by Precambrian crystalline rocks that are not considered an aquifer in eastern Wisconsin.

2.1.2 Site Information

The site consists of four closed CCR surface impoundments that are monitored as a single Closure Area. Closure of the impoundments began in 2020 and was completed in 2021. Adjacent to the surface impoundments is an inactive CCR landfill that was closed prior to 2015 and the area as a whole is regulated by the Wisconsin Department of Natural Resources (Edgewater 1-4 Closed Ash Disposal Facility, License #2524). A groundwater monitoring network of 19 wells was installed at the site to meet state requirements prior to installation of additional monitoring wells to meet CCR Rule requirements. Soils at the site are primarily silt, sand, and some clay to a depth of approximately 80 to 140 feet and overlie dolomite bedrock.

During drilling of CCR wells MW-301, MW-302, and MW-303, the unconsolidated materials were identified as consisting primarily of lean clay overlying sandy silt. The boring log for the previously installed background monitoring well 2R-OW shows lean clay as the primary unconsolidated material at this location. The boring logs for Ash Ponds CCR monitoring wells are provided in **Appendix B**. All CCR monitoring wells are screened within the unconsolidated glacial aquifer.

The water table maps shown on **Figures 3** and **4** are based on groundwater levels measured in the unconsolidated deposits during the April 2023 and October 2023 detection monitoring events. A summary of the sampling events that occurred throughout 2023 is shown in **Table 2**. The groundwater elevations are summarized in **Table 3A** (state wells) and **Table 3B** (CCR wells). Horizontal gradients and flow velocities for each of the flow paths are provided in **Table 4.**

Shallow groundwater in the area of the EDG site generally flows to the south-southeast. There was a more easterly flow direction in the immediate vicinity of the ponds prior to the impoundment closure and capping. Due to the change in flow direction after the closure activities were completed, a fourth downgradient compliance well will be installed on the south side of the closure area and will be documented in the next annual groundwater monitoring report.

Historically, there was some localized groundwater mounding associated with the now closed EDG ponds. With the closure of the ponds, groundwater mounding appears to be decreasing, although levels also vary seasonally. Water levels measured at three wells installed within the closed CCR landfill were historically interpreted as representing the water table, but under current conditions may not be consistent with groundwater elevations in the soil below the landfill and pond closure area. Water levels for these wells are shown in brackets in the water table maps and contours in the landfill and pond closure area are dashed to reflect uncertainty.

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells (Table 1 and Figure 2). The upgradient monitoring well is 2R-OW. The downgradient monitoring wells include MW-301, MW-302, and MW-303 with an additional compliance well to be installed during early 2024 to monitor the closure area on the south side of the Former South Wisconsin Pollutant Discharge Elimination System (WPDES) Pond Location.

The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

3.0 §257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by §257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

3.1 §257.90(E)(1) SITE MAP

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

A map of the site location is provided as Figure 1. A map with an aerial image showing the CCR units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as Figure 2.

3.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

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

No new monitoring wells were installed, and no wells were decommissioned as part of the groundwater monitoring program for the CCR units in 2023.

3.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and

downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Two semiannual groundwater sampling events were completed in April and October 2023 for Appendix III constituents. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection or assessment monitoring programs is included in **Table 2**.

The validation and evaluation of the October 2022 monitoring event data was completed and transmitted to WPL on February 7, 2023. The validation and evaluation of the April 2023 monitoring event data was completed and transmitted to WPL on August 10, 2023. The validation and evaluation of the October 2023 monitoring event data was in progress at the end of 2023 and will be transmitted to WPL in 2024; therefore, the October 2023 monitoring results and analytical report will be included in the 2024 annual report. The groundwater elevations are included in this report.

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

3.4 §257.90(E)(4) MONITORING TRANSITION NARRATIVE

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

There were no transitions between monitoring programs in 2023. The EDG CCR units remained in the detection monitoring program.

In 2023, the monitoring results for the October 2022 and April 2023 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. The comparison to background was based on a prediction limit approach, comparing the results to interwell upper prediction limits (UPLs) based on background monitoring results from the upgradient well (2R-OW). The interwell UPLs were updated in January 2021 using background data collected through October 2020. The October 2022 data were compared to the UPLs updated in January 2021. The January 2021 Statistical Analysis was included as an appendix in the 2021 Annual Groundwater Monitoring Report.

The UPLs were updated in July 2023 using the background data from April 2016 through April 2023. The July 2023 UPL update memorandum is included in **Appendix F.** The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities (U.S. EPA, 2009; Section 5.3.1) recommends periodic updating of background for both intrawell and interwell analyses. For semiannual monitoring, an update interval of 2 to 3 years is recommended; therefore, the next UPL update is planned for 2026.

SSIs for boron, fluoride, and sulfate were identified for both the October 2022 and April 2023 events; however, alternative source demonstrations (ASDs) were completed, demonstrating that a source other than the CCR units was the likely cause of the observed concentrations. The ASD reports are provided in **Appendix E**.

3.5 §257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2023 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

3.5.1 §257.90(e) General Requirements

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

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program was in detection monitoring throughout 2023.

Summary of Key Actions Completed (2022):

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

Description of Any Problems Encountered. No problems were encountered in 2023.

Discussion of Actions to Resolve the Problems. Not applicable.

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

- Statistical evaluation and determination of any SSIs for the October 2023 and April 2024 monitoring events.
- If an SSI is determined, then within 90 days either:
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program.
- Installation of an additional compliance well on the south side of the closure area during early 2024.
- Two semiannual groundwater sampling and analysis events (April and October 2024).

3.5.2 §257.94(d) Alternative Detection Monitoring Frequency

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

Not applicable. No alternative detection monitoring frequency has been proposed.

3.5.3 §257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

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

The ASD reports prepared to address the SSIs observed for the October 2022 and April 2023 sampling events are provided in **Appendix E**. The ASD reports are certified by a qualified professional engineer.

3.5.4 §257.95(c) Alternative Assessment Monitoring Frequency

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

Not applicable. Assessment monitoring has not been initiated.

3.5.5 §257.95(d)(3) Assessment Monitoring Results and Standards

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

Not applicable. Assessment monitoring has not been initiated.

3.5.6 §257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

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

Not applicable. Assessment monitoring has not been initiated.

3.5.7 §257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a

certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by §257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

3.6 §257.90(E)(6) OVERVIEW

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

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

4.0 REFERENCES

Skinner, Earl L., and Borman, Ronald G., 1973, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigation Atlas HA-432.

U.S. EPA, 2009, The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities.

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Tables

Table 1. Groundwater Monitoring Well Network
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

Monitoring Well	Location in Monitoring Network	Role in Monitoring Network
2R-OW	Upgradient	Background
MW-301	Downgradient	Compliance
MW-302	Downgradient	Compliance
MW-303	Downgradient	Compliance

Created by: NDK Date: 9/19/2022
Last revision by: NLB Date: 6/30/2023
Checked by: RM Date: 7/7/2023

Table 2. CCR Rule Groundwater Samples Summary
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

Sample Dates	Compliance Wells			Background Well
	MW-301	MW-302	MW-303	2R-OW
4/25-26/2023	D	D	D	D
10/10-11/2023	D	D	D	D
Total Samples	2	2	2	2

Abbreviations:
D = Required by Detection Monitoring Program

Created by:	NDK	Date:	9/19/2022
Last revision by:	NLB	Date:	12/30/2023
Checked by:	RM	Date:	1/11/2024

Table 3A. Groundwater Elevations - State Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

	Ground Water Elevation in feet above mean sea level (amsl)																		Water Elevation within Landfill		
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**6-AR**	**6R-OW**	**7A-OW**	**7-OW**	**18-OW**	**29-OW**	**29-A**	**30-OW**	**31-OW**	**32-OW**	**36-OW**	**40-OW**	**37-OW**	**38R-OW**	**39R-OW**
Top of Casing Elevation (ft amsl)^	592.18	611.85	591.59	594.68	600.94	600.66	590.78	591.74	593.45	593.19	ABAND	588.72	588.43	591.13	589.22	589.21	ABAND	586.69	615.30	620.24	614.27
Screen Length (ft)																					
Total Depth (ft from top of casing)	11.10	17.53	15.82	16.48	10.65	21.51	19.86	10.37	20.21	9.93	14.25	19.96	43.12	14.88	14.98	14.95	21.01	17.3	18.55	29.00	22.29
Top of Well Screen Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62		596.47	591.98	591.75
Measurement Date																					
October 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	592.00	589.78	583.49	585.33	586.60	586.40	582.58	583.63	599.77		599.42	599.38	598.05
April 18, 2012					595.89	597.13	587.33	587.35	592.35	589.79		585.32	588.39								
October 24, 2012					595.63	596.69	587.42	587.40	592.00	589.78		585.33	586.60								
April 8, 2013	588.50	609.92	588.37	586.35	596.66	597.65	588.40	587.34	592.79	589.95	583.97	585.78	588.07	588.57	584.35	584.50	600.79	--	600.24	600.16	598.30
October 22, 2013	584.88	601.15	580.90	584.46	594.23	595.64	582.64	584.83	591.23	587.24	NM [1]	584.70	586.76	582.19	580.40	580.76	599.13	--	598.22	598.42	596.56
April 22, 2014	588.05	609.22	587.99	586.11	595.18	597.10	587.00	587.37	589.27	589.51	NM [1]	585.38	588.22	587.53	583.75	583.75	NM [1]	--	599.67	599.38	598.56
October 28, 2014	586.14	607.27	586.30	585.08	595.33	596.51	587.68	586.99	591.92	589.29	NM [1]	585.00	587.84	585.48	582.88	582.68	600.07	--	599.81	599.26	598.37
April 7 - 9, 2015	587.90	608.47	587.44	585.52	595.66	596.76	586.99	587.50	591.95	588.50	ABAND	585.44	587.55	586.29	583.21	583.87	599.69	583.77	599.21	599.21	597.46
October 8, 2015	584.78	604.22	583.34	584.52	594.76	594.47	582.65	585.67	591.23	589.71	ABAND	584.69	587.27	584.26	581.60	582.52	600.29	583.01	599.47	599.70	598.09
April 4-5, 2016	588.40	610.02	587.72	586.69	596.70	597.81	584.52	585.68	592.41	587.93	ABAND	582.95	587.25	586.91	584.35	584.47	601.05	579.28	601.37	601.18	601.13
October 17, 2016 [2]	587.50	607.27	586.71	585.15	595.41	596.82	584.34	586.61	592.01	587.65	ABAND	581.25	586.10	586.23	583.02	583.83	600.87	579.42	600.70	600.74	599.49
April 12-13, 2017	588.23	609.80	587.95	586.31	596.08	597.69	586.77	587.32	592.19	587.06	ABAND	583.74	585.43	585.36	583.68	584.52	602.01	584.02	602.11	602.08	601.29
October 9, 2017	584.14	600.87	581.00	584.49	594.68	596.04	583.03	583.51	590.50	585.96	ABAND	583.01	584.88	582.76	580.93	581.18	600.18	583.05	598.48	599.65	598.07
April 2, 2018	587.79	607.87	586.63	586.68	595.73	596.88	586.80	587.44	591.76	589.62	ABAND	585.51	587.11	585.68	582.95	582.85	600.71	583.64	600.00	600.04	597.99
June 19, 2018	NM	605.70	585.49	585.20	595.41	NM	NM	NM	NM	587.20	ABAND	585.43	585.79	584.96	582.29	NM	NM (1)	583.07	600.44	600.68	599.61
October 1, 2018	585.37	604.61	584.18	584.86	595.24	596.44	586.10	586.86	591.01	588.75	ABAND	585.04	584.94	584.79	582.11	582.81	600.30	583.17	600.12	600.27	599.79
April 8, 2019	588.57	609.50	588.01	591.93	596.03	597.33	584.61	587.35	591.92	590.06	ABAND	585.76	586.75	587.83	584.18	584.85	600.21	583.75	599.60	599.74	598.49
October 9-10, 2019	587.85	609.39	587.39	585.99	595.68	596.92	586.42	587.24	591.66	587.53	ABAND	585.14	585.10	587.15	583.63	584.48	599.92	583.08	600.25	600.01	599.82
April 8-9, 2020	588.03	608.97	587.70	586.05	595.57	596.89	585.74	586.95	591.61	587.76	ABAND	584.98	587.35	587.29	583.70	584.59	599.40	583.01	599.52	599.48	599.38
October 14-15, 2020	584.62	604.37	582.20	584.54	593.27	594.86	582.71	583.45	588.81	586.53	ABAND	583.95	586.83	583.83	582.60	582.82	ABAND	583.26	596.87	NM	594.72
April 14, 2021	587.95	608.50	587.64	585.42	594.87	596.13	586.53	587.29	591.28	589.89	ABAND	585.16	587.64	587.06	583.46	584.25	ABAND	583.08	DRY	596.50	593.95
October 27-28, 2021	584.53	603.62	580.74	584.47	593.06	594.70	579.90	584.60	590.45	587.39	ABAND	584.60	586.65	582.89	581.88	582.02	ABAND	582.74	DRY	595.49	592.34
February 28, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	ABAND	NM	NM	NM	NM	NM	ABAND	NM	DRY	595.25	NM
April 13, 2022	588.64	608.63	588.30	585.06	595.72	595.11	586.08	588.15	591.60	590.70	ABAND	584.69	584.82	588.02	584.10	585.09	ABAND	583.09	DRY	594.43	DRY
October 6, 2022	584.39	601.93	580.62	583.52	593.16	593.41	582.43	584.86	590.02	587.38	ABAND	583.21	584.18	583.09	581.55	581.98	ABAND	582.60	DRY	594.62	593.36
April 25-26, 2023	588.51	607.74	588.00	585.15	595.48	595.22	588.13	588.18	591.90	590.13	ABAND	584.92	586.46	587.94	583.60	584.62	ABAND	583.17	597.35	596.81	598.09
October 10-11, 2023	583.99	599.85	579.87	583.26	592.52	592.83	583.52	582.36	588.67	585.67	ABAND	583.46	583.80	582.27	580.47	581.37	ABAND	582.01	DRY	595.63	594.40
Bottom of Well Elevation (ft)	591.72	612.72	591.32	595.60	600.72	601.84	591.32	590.98	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	568.75	596.47	592.14	591.75

Notes:
NM = not measured
ABAND = abandoned

Created by: MDB Date: 5/6/2013
Last revision by: NLB Date: 12/29/2023
Checked by: RM Date: 1/11/2024

1: Well broken
2: Well casings at 7-OW, 7A, and 29-OW were cut down to allow the protective covers to close. 7-OW was cut down by 0.22 ft, 7A was cut down by 0.29 ft, and 29-OW was cut down by 0.17 ft.
Top of casing elevations in this table were adjusted accordingly.
*: Well was frozen

^: Monitoring well adjustments and resurveys:
Monitoring well 38R-OW was extended on October 30, 2020 during repairs following well damage by pond closure construction equipment.
Monitoring Well 40-OW cut down to have a top of casing elevation of 586.05 famsl on December 3, 2021.
All active monitoring wells were resurveyed in January 2023. These elevations are retroactively applied to 2022 monitoring events.

Table 3B. Groundwater Elevations - CCR Monitoring Wells
WPL - Edgewater 1-4 (Closed) Ash Disposal Facility / SCS Engineers Project #25223068.00

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	**MW-301**	**MW-302**	**MW-303**	**2R-OW**
Top of Casing Elevation (feet AMSL)[1,2,3]	606.90	607.70	604.78	611.85
Screen Length (ft)	5.00	5.00	5.00	10.00
Total Depth (ft from top of casing)	27.47	40.00	33.26	14.50
Top of Well Screen Elevation (ft)	581.95	580.15	579.60	608.22
Measurement Date				
April 8, 2016	599.75	596.19	589.04	609.68
June 20, 2016	598.30	595.68	587.22	606.70
August 9, 2016	598.00	595.53	587.72	605.74
October 20, 2016	598.50	595.46	588.37	607.27
January 23-24, 2017	597.10	596.30	588.84	609.64
April 6, 2017	600.04	593.57	589.04	609.72
October 24, 2017	598.77	595.86	588.44	607.63
August 1, 2017	597.40	595.22	587.36	604.59
October 24, 2017	597.20	595.25	587.97	601.74
April 2, 2018	598.54	595.71	588.77	607.87
October 1, 2018	597.60	595.28	588.17	604.61
April 8, 2019	598.92	595.68	588.88	609.50
October 7, 2019	599.56	595.58	588.77	609.39
June 26, 2020	597.89	NM	NM	NM
October 15, 2020	595.10	590.18	585.07	604.27
April 14, 2021	596.81	592.18	586.89	608.50
October 26, 2021	592.32	591.44	585.95	604.04
April 13, 2022	597.37	593.05	587.99	608.63
October 6, 2022	592.69	591.96	586.42	601.93
April 25-26, 2023	597.77	593.63	587.99	607.74
October 10, 2023	592.51	592.01	585.79	600.38
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured
(1): MW-302 and MW-303 were shortened in September 2020 due to site regrading during pond closure. The wells were resurveyed in November 2020.
(2): MW-301 was extended in November 2020 due to site regrading during pond closure. The well was resurveyed in November 2020.
(3): All site wells were re-surveyed in January 2023, and elevations were tied to NGS benchmark PID #DE7593. These elevations are retroactively applied to 2022 monitoring events.

Created by:	MDB	Date:	6/27/2016
Last rev. by:	MDB	Date:	5/2/2023
Checked by:	REO	Date:	5/4/2023
Scientist QA/QC:	TK	Date:	1/8/2024

Table 4. Horizontal Gradients and Flow Velocity - CCR Monitoring Wells
Edgewater 1-43 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00
January - December 2023

	Flow Path A - South				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
4/25-26/2023	587.99	585.00	174	0.02	0.01

	Flow Path B - Southeast				
Sampling Dates	**h1 (ft)**	**h2 (ft)**	**Δl (ft)**	**Δh/Δl (ft/ft)**	**V (ft/d)**
10/10-11/2023	590.00	585.79	328	0.01	0.01

Wells	**K Value (cm/sec)**	**K Value (ft/d)**
MW-301	2.1E-05	0.060
MW-302	4.0E-04	1.139
MW-303	1.1E-04	0.304
Geometric Mean	9.7E-05	0.274

Assumed Porosity, n
0.40

Groundwater flow velocity equation: V = [K*(Δh/Δl)] / n

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

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

Created by: NDK Date: 9/19/2022
Last revision by: NLB Date: 12/26/2023
Checked by: RM Date: 12/29/2023

Table 5A. Groundwater Analytical Results Summary - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		10/6/2022	10/6/2022	10/6/2022	10/6/2022
Groundwater Elevation, ft amsl		601.93	592.69	591.96	586.42
Appendix III					
Boron, µg/L	86	49.0	6,230	1,610	3,650
Calcium, µg/L	200,000	152,000	86,900	64,000	135,000
Chloride, mg/L	400	414	15.5	21.2	22.0
Fluoride, mg/L	0.2	<0.095	0.21 J	0.87	<0.095
Field pH, Std. Units	8.57	7.08	7.56	7.89	6.92
Sulfate, mg/L	36.2	28.0	213	70.5	<0.44
Total Dissolved Solids, mg/L	1,190	1,110	572	306	658

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

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable

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

Notes:
1. An individual result above the UPL does not constitute an SSI above background.
See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: NDK Date: 9/19/2022
Last revision by: NLB Date: 3/31/2023
Checked by: RM Date: 7/7/2023
Scientist/PM QA/QC: TK Date: 1/8/2024

Table 5B. Groundwater Analytical Results Summary - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	MW-301	MW-302	MW-303
		4/26/2023	4/25/2023	4/26/2023	4/25/2023
Groundwater Elevation, ft amsl		607.74	597.77	593.63	587.99
Appendix III					
Boron, µg/L	78.4	32.0	6,770	1,450	4,870
Calcium, µg/L	201,000	91,800 P6	87,900	46,900	128,000
Chloride, mg/L	456	53.4	17.9	16.5	22.3
Fluoride, mg/L	0.200	0.11 J	0.21 J	0.75	<0.095
Field pH, Std. Units	8.57	7.30	7.63	7.85	6.87
Sulfate, mg/L	36.7	7.5	168	75.4	0.50 J
Total Dissolved Solids, mg/L	1,220	512	554	344	740

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

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
µg/L = micrograms per liter

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

Notes:
1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.

2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on 1-of-2 retesting approach. The interwell UPLs were updated in July 2023 using data from April 2016 through April 2023.

Created by:	NDK	Date: 9/19/2022
Last revision by:	NLB	Date: 6/30/2023
Checked by:	RM	Date: 7/7/2023
Scientist/PM QA/QC:	TK	Date: 1/8/2024

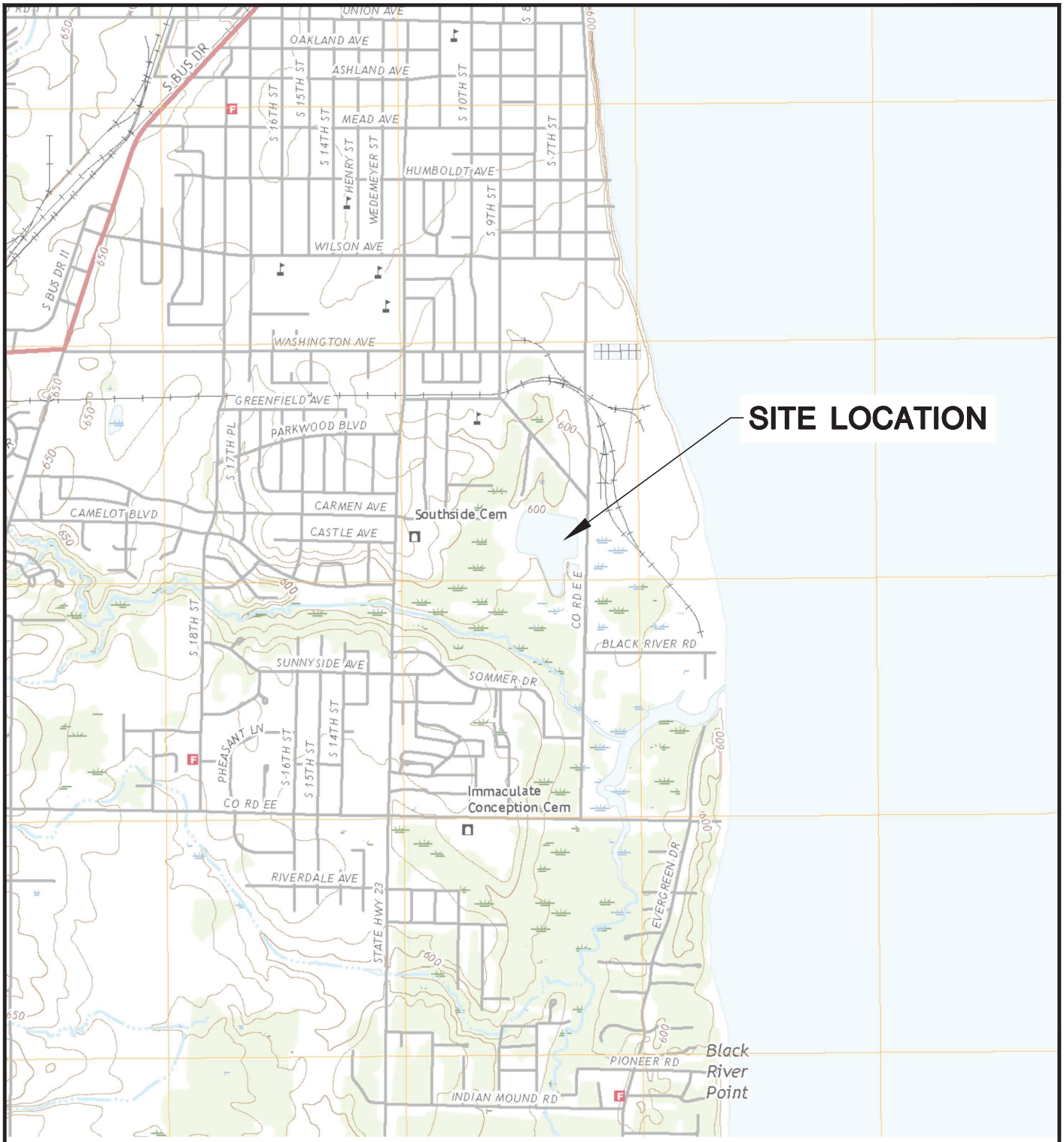
Table 6. Groundwater Field Data Summary - CCR Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	10/6/2022	590.21	11.6	7.56	0.39	804	-42	20.7
	4/25/2023	597.77	8.5	7.63	3.14	765	416	96.1
MW-302	10/6/2022	599.41	12.1	7.89	0.61	499	105	21.9
	4/26/2023	593.63	8.7	7.85	1.86	501	169	3.1
MW-303	10/6/2022	593.63	11.8	6.92	1.31	1,184	175	165
	4/25/2023	587.99	8.0	6.87	5.27	1,230	370	44.1
2R-OW	10/6/2022	602.80	13.6	7.08	1.06	1,992	523	2.75
	4/26/2023	607.74	6.9	7.30	0.90	889	306	3.62

Abbreviations:
mg/L = milligrams per liter
µmhos/cm = micromhos per centimeter
mV = millivolts
ft amsl = feet above mean sea level
ORP = Oxidation-reduction potential

Created by:	NDK	Date:	9/19/2022
Last revision by:	NLB	Date:	6/30/2023
Checked by:	RM	Date:	7/7/2023

Figures



N

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

CLIENT	WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE	EDGEWATER 1–4 (CLOSED) ASH DISPOSAL FACILITY SHEBOYGAN, WISCONSIN
	SITE LOCATION MAP		

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

ENGINEER

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

FIGURE
1

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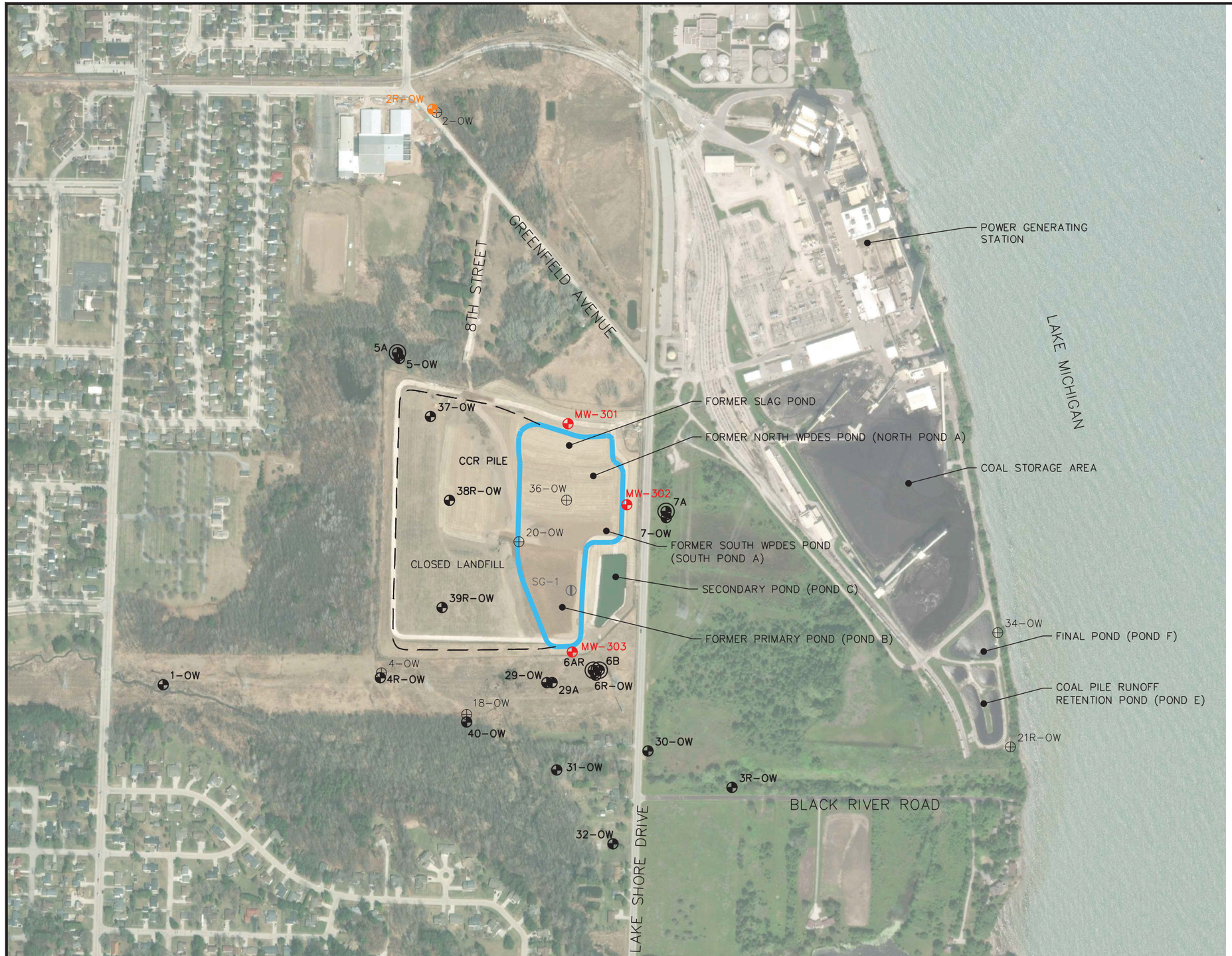

LEGEND

- CCR RULE MONITORING WELL
- CCR RULE BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL
- ADDITIONAL PIEZOMETER
- ABANDONED MONITORING WELL
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. CCR UNIT LIMITS AND CLOSED LANDFILL LOCATION ARE APPROXIMATE.
4. MONITORING WELLS MW-301, MW-302, AND MW-303 WERE INSTALLED BY BADGER STATE DRILLING BETWEEN JANUARY 14 AND FEBRUARY 4, 2016.
5. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER GENERATING STATION IS 2R-OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

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

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

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LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 — WATER TABLE ELEVATION
- [597.35] — WATER TABLE ELEVATION WITHIN LANDFILL
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON APRIL 25-26, 2023.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25223068.00	DRAWN BY:	KP
DRAWN:	07/20/2023	CHECKED BY:	NLB
REVISED:	01/11/2024	APPROVED BY:	TK 1/25/2024

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

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
APRIL 2023

FIGURE
3

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N

LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- FLOW PATH FOR VELOCITY CALCULATION (SEE TABLE 4)
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- **598.54** WATER TABLE ELEVATION
- **[595.63]** WATER TABLE ELEVATION WITHIN LANDFILL
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON OCTOBER 10-11, 2023.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25223068.00	DRAWN BY:	KP
DRAWN:	12/01/2023	CHECKED BY:	NLB
REVISED:	01/11/2024	APPROVED BY:	TK 1/25/2024

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

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
OCTOBER 2023

FIGURE
4

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Appendix A

Summary of the Regional Hydrogeologic Stratigraphy

Table EGS-3. Regional Hydrogeologic Stratigraphy
Edgewater Generating Station / SCS Engineers Project #25215053

Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary	Sand and Gravel Aquifer	0 to 235	Surface sand and gravel	Sand and Gravel
		0 to 300	Buried sand and gravel	
Devonian	Niagara Dolomite Aquifer	0 to 750	Dolomite (undifferentiated)	Dolomite
Silurian				
Ordovician	Confining Unit	0 to 400	Maquoketa Shale	Shale and dolomite
	Sandstone Aquifer	100 to 340	Galena Decorah Platteville	Dolomite
		0 to 330	St. Peter	Sandstone
		0 to 140	Prairie du Chien	Dolomite
Cambrian		0 to 3,500?	Trempeleau Franconia Galesville Eau Claire Mt. Simon	Sandstone, some Dolomite and Shale
Precambrian	Not an Aquifer	Unknown	Crystalline Rocks	Igneous and metamorphic rocks

Source:
Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

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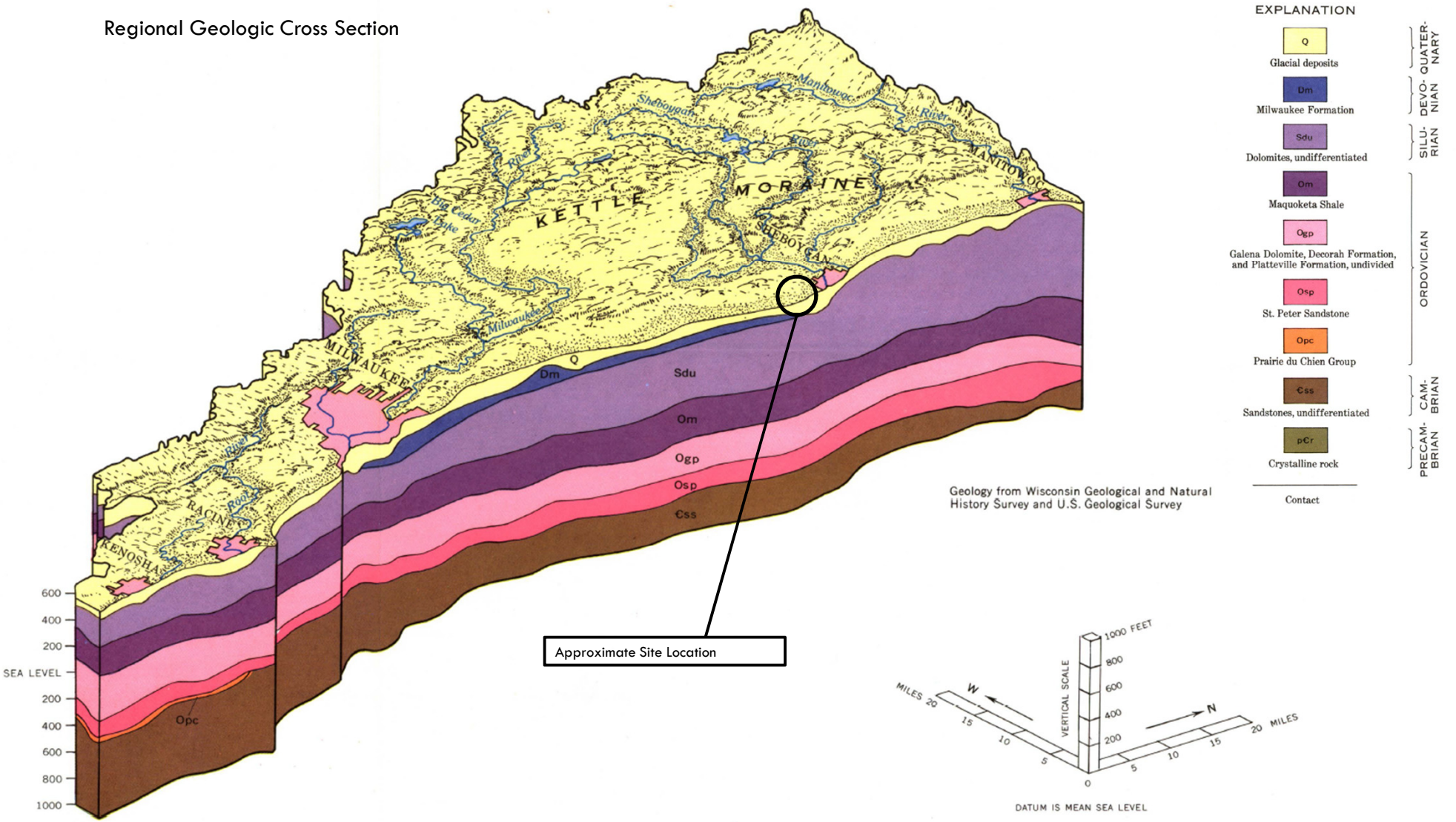
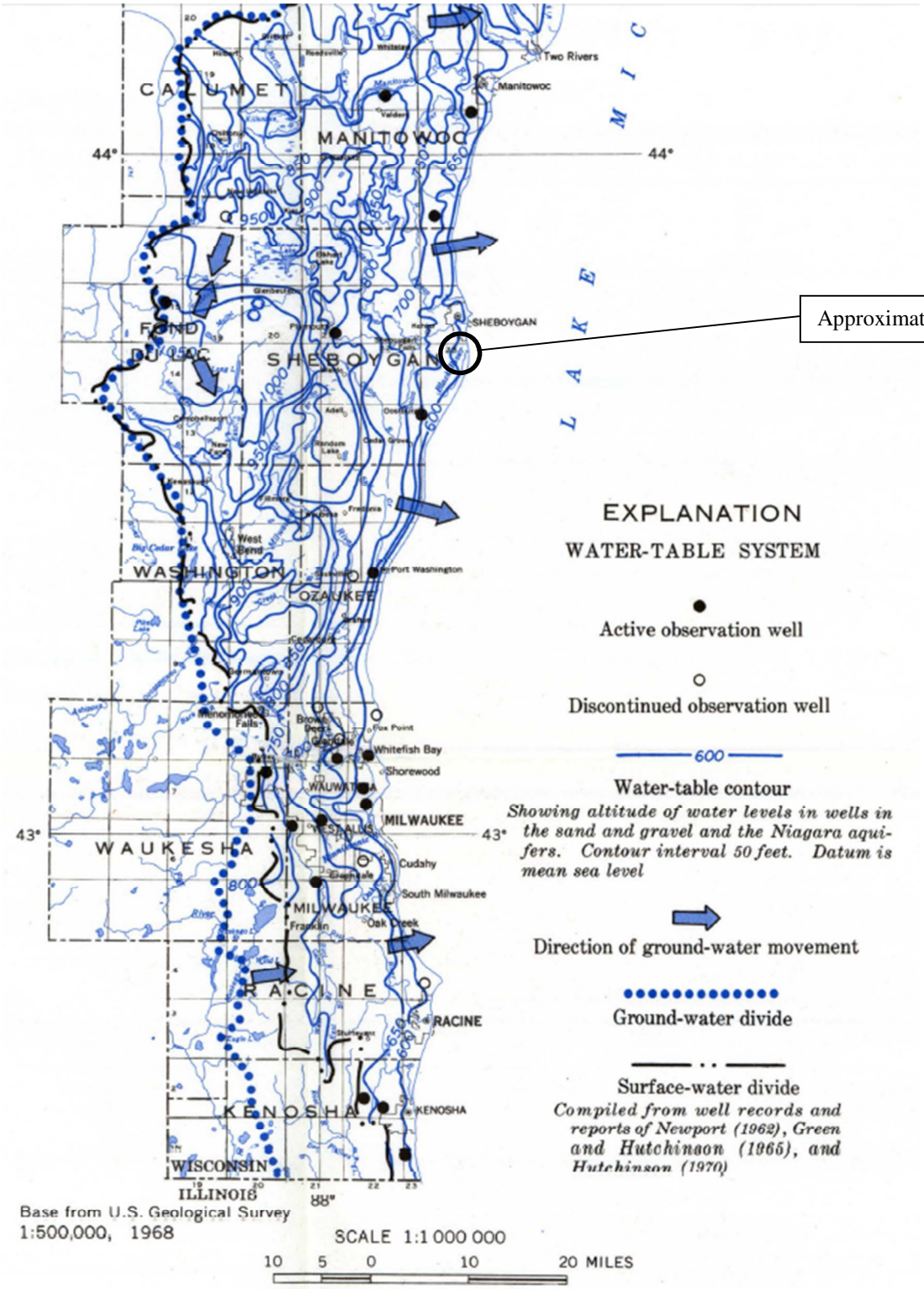
Regional Geologic Cross Section



Source: Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

Regional Groundwater Flow Map – Uppermost Aquifer



Source: Skinner, Earl L. and Ronald G. Borman, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigations Atlas HA-432, 1973.

Appendix B

Boring Logs and Well Construction Documentation

State of Wisconsin
Department of Natural Resources

Route To:
☐ Solid Waste ☐ Haz. Waste
☐ Emergency Response ☐ Underground Tanks
☐ Wastewater ☐ Water Resources
☐ Other

Soil Boring Log Information
Form 4400-122 7-91

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
Monitoring Well Installation	02524	2R-OW

Boring Drilled By (Firm name and name of crew chief)	Date Drilling Started	Date Drilling Completed	Drilling Method
M&K Environmental Drilling. Chief Driller Michael McCardle.	04/29/98	04/29/98	HSA

DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
			607.2 Feet MSL	610.3 Feet MSL	8.0 Inches

Boring Location
NW 1/4 of NE 1/4 of Section 2 T 14 N,R 23E
Lat ° ' "
Long ° ' "

Local Grid Location (If applicable)
1772 Feet ☐ S ☒ N 1600 Feet ☐ W ☒ E

County	DNR County Code	Civil Town/City/ or Village
SHEBOYGAN	60	SHEBOYGAN

Sample Number	Sample Length (in) Recovered	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plastic Limit	P 200	RQD/ Comments
			1	TOPSOIL	TS									
			2	LEAN CLAY - moist, stiff, yellowish brown (10YR 5/6), silty sand seams.	CL									
1	18	12	3						12	23.6				
			4											
2	18	22	5	...very stiff.					22	16.6				
			6											
			7											
3	18	46	8	...hard.					46	16.8				
			9											
			10											
4	18	26	11	...wet, very stiff, dark brown (10YR 4/3), occasional sand seams.					26	19.7			98.4	
			12											
5	18	15	13	...moist.					15	22.8				
			14											

NOTES:
1) End of boring at 14.5 feet.
2) Monitoring Well 2R-OW constructed at completion.

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

Signature

Firm: Miller Engineers & Scientists
5308 South 12th Street, Sheboygan, WI 53081
Tel: (920)458-6164 Fax: (920)458-0369

This form is authorized by Chapters 144, 147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than $10 nor more than $5,000 for each violation. Fined not less than $10 or more than $100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-301

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	1/14/2016	1/14/2016	4 1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV862		MW-301	13.7 Feet	601.95 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 632,741 N, 2,573,429 E S/C/N
NE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3	Standing water at 3' in existing hydrovac hole and boring at toe of berm.										Standing water at 3 ft bgs in existing hole and boring at toe of berm.
			4											
			5											
			6											
			7											
			8	SILTY CLAY, brown (7.5YR 4/6).										
S1	22	5 7 9 13	9						3.5	M				water @ 11.9 ft bgs after sitting an hour with augers at 20 ft bgs.
			10											
			11		CL-ML									
			12											
			13											
S2	20	7 13 23 21	14	SANDY SILT, grey brown (10YR 4/2).	ML				2.75	W				
			15											

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

Signature: for Joe Larson
Firm: SCS Engineers
2830 Dairy Drive Madison, WI 53718
Tel: (608) 224-2830
Fax:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

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

Sample: Number and Type	Sample: Length Att. & Recovered (in)	Sample: Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SANDY SILT, grey brown.										
			17											
			18											
S3	20	5 7 18 13	19							W				
			20	Same as above, except brown (7.5 YR 4/6).										
			21											
			22											
			23											
S4	22	2 2 3 4	24							W				
			25		ML									
S5	20	3 3 4 9	26							W				screen 20-25 ft bgs.
			27											
			28											
S6	24	2 2 2 2	29							W				
			30											
S7	24	2 2 4 8	31							W				
			32											
S8	16	2 3 4 5	33							W				
			34											
S9	24	2 2 2 2	35						1.0	M				water at 16.8 ft bgs with augers at 34 ft bgs.
			36	CLAY, grey (7.5YR 4/6).	CL									
				End of boring at 36 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-302

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	1/15/2016	1/15/2016	4-1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV861		MW-302	Feet	612.65 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 632,343 N, 2,573,726 E S/C/N
SE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ___ ° ___ ' ___ "
Long ___ ° ___ ' ___ "
Local Grid Location
Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	SANDY CLAY, various colors (fill).										
S1	16	6 8 11 10	9		CL				2.5/1.75	M				
			10											
			11											
			12											
			13											
S2	16	5 6 11 19	14						3.5	M				
			15											

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

Signature	Firm	Tel: (608) 224-2830
for Joe Larson	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-302 Use only as an attachment to Form 4400-122.

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16	SANDY CLAY, (fill).	CL									
			17											
			18											
S3	16	6 7 9 12	19						3.25	M				
			20	CLAY, dark brown, some gravel and fill (topsoil).	CL									
			21											
			22	LEAN CLAY, brown (7.5YR 4/6).										
			23											
S4	24	4 7 10 13	24						2.75	M				
			25		CL									
			26											
			27											
			28											
S5	24	6 6 7 8	29	SANDY SILT, brown (7.5YR 4/6).					1.5	W				
			30											
S6	12	5 7 8 8	31											
			32											
S7	22	2 2 4 9	33											
			34		ML									
S8	24	2 2 4 7	35	6 inch sandier zone at 35-35.5 ft bgs, soil less cohesive, more water.										
			36											
S9	24	2 2 2 4	37							W				
			38											
S10	24	2 2 4 6	39											water at 17.8 ft bgs after well installation.
			40	End of boring at 40 ft bgs.										

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION

Form 4400-122 Rev. 7-98

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

Facility/Project Name	License/Permit/Monitoring Number	Boring Number
WPL-Edgewater Generating Station SCS#: 25215135.10		MW-303

Boring Drilled By: Name of crew chief (first, last) and Firm	Date Drilling Started	Date Drilling Completed	Drilling Method
Kevin Durst Badger State	2/4/2016	2/4/2016	4-1/4 Hollow stem auger

WI Unique Well No.	DNR Well ID No.	Common Well Name	Final Static Water Level	Surface Elevation	Borehole Diameter
VV860		MW-303	Feet	609.73 Feet	8.5 in.

Local Grid Origin ☐ (estimated: ☐) or Boring Location ☒
State Plane 631,609 N, 2,573,497 E S/C/N
SE 1/4 of NW 1/4 of Section 2, T 14 N, R 23 E
Lat ° ' "
Long ° ' "
Local Grid Location Feet ☐ N ☐ S Feet ☐ E ☐ W

Facility ID	County	County Code	Civil Town/City/ or Village
	Shawano	59	Sheboygan

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	RQD/ Comments
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3											
			4											
			5											
			6											
			7											
			8	SANDY LEAN CLAY, yellowish brown (10YR 5/4).										
S1	15	5 9 9 12	9		CL				3.0	W				
			10											
			11											
			12											
			13	Same as above except, very dark grayish brown (10YR 3/2).										
S2	18	11 11 12 14	14						>4.5	W				
			15											

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

Signature	Firm	Tel: (608) 224-2830
for Kyle Kramer	SCS Engineers 2830 Dairy Drive Madison, WI 53718	Fax:

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

State of Wisconsin
Department of Natural Resources

SOIL BORING LOG INFORMATION SUPPLEMENT
Form 4400-122A

Boring Number MW-303 Use only as an attachment to Form 4400-122. Page 2 of 2

Sample Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties: Standard Penetration	Soil Properties: Moisture Content	Soil Properties: Liquid Limit	Soil Properties: Plasticity Index	Soil Properties: P 200	RQD/ Comments
			16											
			17											
			18	Same as above except, yellowish brown (10YR 5/4).										
S3	20	6 8 13 14	19		CL				2.0	W				
			20											
			21											
			22											
			23	Same as above except, very dark grayish brown (10YR 3/2).										
S4	22	5 8 8 12	24	SANDY SILT, yellowish brown (10YR 5/4).					1.75	W				
			25											
S5	16	8 12 14 17	26							W				
			27											
S6	24	4 5 3 3	28		ML					W				
			29											
S7	24	3 6 9 14	30							W				
			31											
			32											
			33	End of boring at 33 ft bgs.										

State of Wisconsin
Department of Natural Resources

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

MONITORING WELL CONSTRUCTION
Form 4400-113A Rev. 4-90

Facility/Project Name: WPL Edgewater Site

Facility License, Permit or Monitoring Number: 025524

Type of Well: Water Table Observation Well ☒ 11; Piezometer ☐ 12

Distance Well Is From Waste/Source Boundary: ____ ft.

Is Well A Point of Enforcement Std. Application? ☐ Yes ☒ No

Local Grid Location of Well: 1771.89 ft. ☒ N. ☐ S. 1599.69 ft. ☐ E. ☒ W.

Grid Origin Location: Lat. ____ Long. ____ or St. Plane ____ ft. N, ____ ft. E.

Section Location of Waste/Source: NW 1/4 of NE 1/4 of Sec. 2, T. 14 N, R. 23 ☒ E. ☐ W.

Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☐ Downgradient n ☐ Not Known

Well Name: 2A-OW

Wis. Unique Well Number: ____ DNR Well Number: ____

Date Well Installed: 4/29/98 (m m d d y y)

Well Installed By: (Person's Name and Firm)
Mike McArole
M+K Environmental

A. Protective pipe, top elevation 612.80 ft. MSL
B. Well casing, top elevation 612.72 ft. MSL
C. Land surface elevation 610.3 ft. MSL
D. Surface seal, bottom ____ ft. MSL or 1.0 ft.

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

13. Sieve analysis attached? ☐ Yes ☐ No

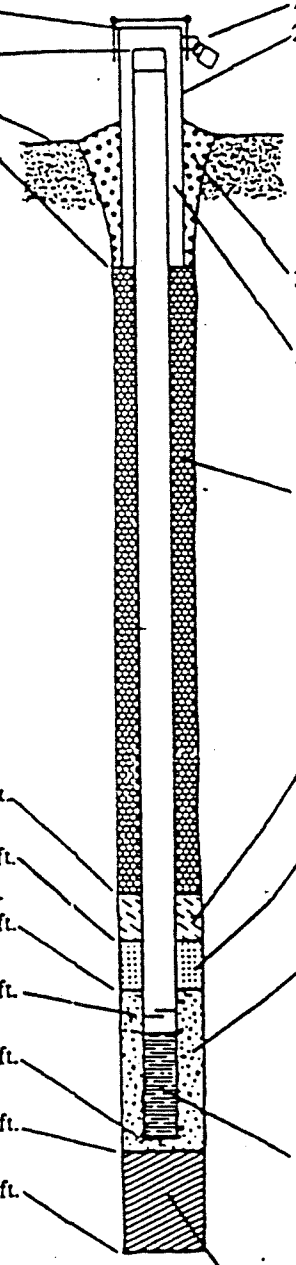
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ __

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

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

17. Source of water (attach analysis):

E. Bentonite seal, top ____ ft. MSL or 1.0 ft.
F. Fine sand, top ____ ft. MSL or 3.5 ft.
G. Filter pack, top ____ ft. MSL or 3.5 ft.
H. Screen joint, top ____ ft. MSL or 4.5 ft.
I. Well bottom ____ ft. MSL or 14.5 ft.
J. Filter pack, bottom ____ ft. MSL or 14.5 ft.
K. Borehole, bottom ____ ft. MSL or 14.5 ft.
L. Borehole, diameter 8.0 in.
M. O.D. well casing 2.38 in.
N. I.D. well casing 2.00 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: ___.__ in.
b. Length: ___.__ ft.
c. Material: Steel ☒ 04; Other ☐ __
d. Additional protection? ☐ Yes ☒ No
If yes, describe: ____
3. Surface seal: Bentonite ☐ 30; Concrete ☒ 01; Other ☐ __
4. Material between well casing and protective pipe: Bentonite ☒ 30; Annular space seal ☐ __; Other ☐ __
5. Annular space seal: a. Granular Bentonite ☒ 33
b. ____ Lbs/gal mud weight ... Bentonite-sand slurry ☐ 35
c. ____ Lbs/gal mud weight ..... Bentonite slurry ☐ 31
d. ____ % Bentonite ..... Bentonite-cement grout ☐ 50
e. ____ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☒ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite pellets ☐ 32
c. ____ Other ☐ __
7. Fine sand material: Manufacturer, product name & mesh size
a. Badger Mine 65-75
b. Volume added ____ ft^3
8. Filter pack material: Manufacturer, product name and mesh size
a. Badger Mine 65-75
b. Volume added ____ ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; ____ Other ☐ __
10. Screen material: PVC
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ __
b. Manufacturer Geotech Inc.
c. Slot size: 0.010 in.
d. Slotted length: ___.__ ft.
11. Backfill material (below filter pack): None ☒ 14; Other ☐ __

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

Signature: [signature] Firm: Miller Engineers + Scientists

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch.144, Wis Stats., failure to file this form may result in a forfeiture of not less than $10, nor more than $5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than $10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

SCS # 25215135.10

State of Wisconsin
Department of Natural Resources

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

MONITORING WELL CONSTRUCTION

Form 4400-113A Rev. 7-98

Facility/Project Name: WPL-Edgewater Generating Station	Local Grid Location of Well: ____ ft. ☐N ☐S, ____ ft. ☐E ☐W	Well Name: MW-301
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒; Lat. ° ' " Long. ° ' " or	Wis. Unique Well No.: VV862 ____ ____ ____ DNR Well ID No.: ____ ____ ____
Facility ID: 460021980	St. Plane 632740.8 ft. N, 2573428.5 ft. E. S/C/N	Date Well Installed: 1 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: NE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst; Badger State Drilling
Distance from Waste/Source ____ ft.	Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known
		Gov. Lot Number: ____

A. Protective pipe, top elevation 604.61 ft. MSL

B. Well casing, top elevation 604.42 ft. MSL

C. Land surface elevation 601.95 ft. MSL

D. Surface seal, bottom 601.45 ft. MSL or 0.5 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

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

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

16. Drilling additives used? ☐ Yes ☒ No

Describe ____

17. Source of water (attach analysis, if required): None

E. Bentonite seal, top 601.45 ft. MSL or 0.5 ft.

F. Fine sand, top 585.95 ft. MSL or 16 ft.

G. Filter pack, top 583.95 ft. MSL or 18 ft.

H. Screen joint, top 581.95 ft. MSL or 20 ft.

I. Well bottom 576.95 ft. MSL or 25 ft.

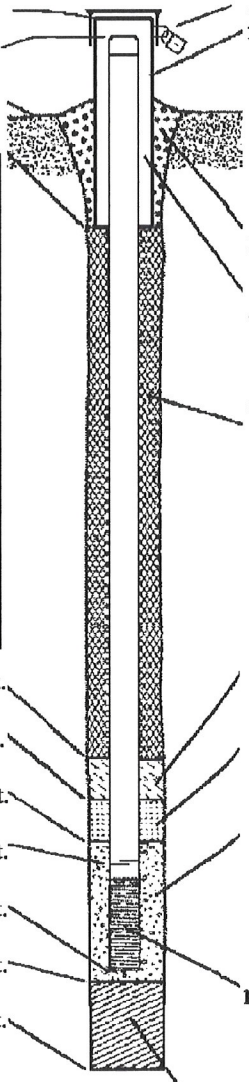
J. Filter pack, bottom 573.95 ft. MSL or 28 ft.

K. Borehole, bottom 565.95 ft. MSL or 36 ft.

L. Borehole, diameter 8.5 in.

M. O.D. well casing 2.04 in.

N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No

2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04; Other ☐ ____
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Steel Posts -3

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

4. Material between well casing and protective pipe: Bentonite ☐ 30; Other ☒ ____
Ohio #5 Sand

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

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

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

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

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

10. Screen material: 2" dia PVC Sch 40
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; Other ☐ ____
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.

11. Backfill material (below filter pack): None ☐ 14; Other ☒ ____
3/8 Bentonite Chips

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

Signature: John P. for Kyle Kramer | Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

SCS # 25215135.10

State of Wisconsin
Department of Natural Resources

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

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

Facility/Project Name: WPL-Edgewater Generating Station	Local Grid Location of Well: ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: MW-302
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VV861 ___ ___ ___ DNR Well ID No.: ___ ___ ___
Facility ID: 460021980	St. Plane 632342.6 ft. N, 2573726.3 ft. E. S/C/N	Date Well Installed: 1 / 15 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst; Badger State Drilling
Distance from Waste/Source ___ ft. Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number: ___

A. Protective pipe, top elevation 615.35 ft. MSL
B. Well casing, top elevation 615.15 ft. MSL
C. Land surface elevation 612.65 ft. MSL
D. Surface seal, bottom 612.15 ft. MSL or 0.5 ft.

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

13. Sieve analysis performed? ☐ Yes ☒ No

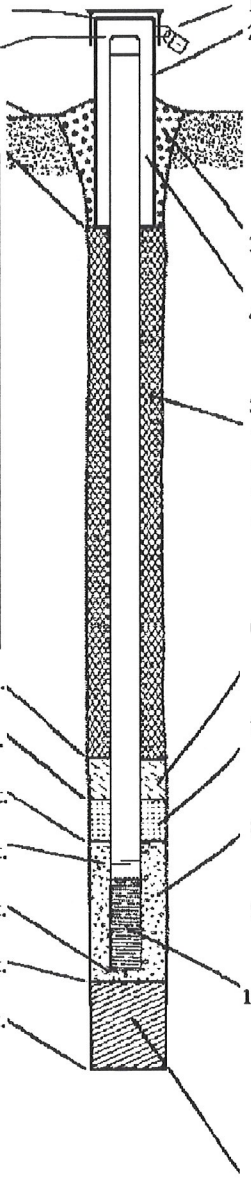
14. Drilling method used: Rotary ☐ 50; Hollow Stem Auger ☒ 41; Other ☐ ___

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

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

17. Source of water (attach analysis, if required):
None

E. Bentonite seal, top 612.15 ft. MSL or 0.5 ft.
F. Fine sand, top 584.15 ft. MSL or 28.5 ft.
G. Filter pack, top 582.15 ft. MSL or 30.5 ft.
H. Screen joint, top 580.15 ft. MSL or 32.5 ft.
I. Well bottom 575.15 ft. MSL or 37.5 ft.
J. Filter pack, bottom 572.65 ft. MSL or 40 ft.
K. Borehole, bottom 572.65 ft. MSL or 40 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.4 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☒ No
2. Protective cover pipe:
a. Inside diameter: 6.0 in.
b. Length: 5.0 ft.
c. Material: Steel ☒ 04; Other ☐ ___
d. Additional protection? ☒ Yes ☐ No
If yes, describe: Steel posts
3. Surface seal: Bentonite ☒ 30; Concrete ☐ 01; Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30; Ohio #5 Sand; Other ☐ ___
5. Annular space seal: a. Granular/Chipped Bentonite ☒ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☒ 01; Tremie pumped ☐ 02; Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. ___ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. Ohio #7 sand ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5 sand ☐
b. Volume added 2 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23; Flush threaded PVC schedule 80 ☐ 24; Other ☐ ___
10. Screen material: ___
a. Screen type: Factory cut ☒ 11; Continuous slot ☐ 01; 2" dia sch 40 PVC; Other ☐ ___
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ 14; Other ☐ ___

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

Signature: for Kyle Kramer | Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

SCS # 25215135.10

State of Wisconsin
Department of Natural Resources

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

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

Facility/Project Name: WPL-Edgewater Generating Station	Local Grid Location of Well: ___ ft. ☐N ☐S ___ ft. ☐E ☐W	Well Name: MW-303
Facility License, Permit or Monitoring No.: 02524	Local Grid Origin ☐ (estimated: ☐) or Well Location ☒ Lat. ___ ° ___ ' ___ " Long. ___ ° ___ ' ___ " or	Wis. Unique Well No.: VV860 / DNR Well ID No.: ___
Facility ID: 460021980	St. Plane 631609.4 ft. N, 2573496.7 ft. E. S/C/N	Date Well Installed: 2 / 4 / 2016 (m m d d y y y y)
Type of Well: Well Code 12 / PZ	Section Location of Waste/Source: SE 1/4 of NW 1/4 of Sec. 02, T. 14 N, R. 23 ☒E ☐W	Well Installed By: Name (first, last) and Firm: Kevin Durst; Badger State Drilling
Distance from Waste/Source ___ ft. / Enf. Stds. Apply ☐	Location of Well Relative to Waste/Source: u ☐ Upgradient s ☐ Sidegradient d ☒ Downgradient n ☐ Not Known	Gov. Lot Number: ___

A. Protective pipe, top elevation 612.19 ft. MSL
B. Well casing, top elevation 611.99 ft. MSL
C. Land surface elevation 609.73 ft. MSL
D. Surface seal, bottom 609.23 ft. MSL or 0.5 ft.

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

13. Sieve analysis performed? ☐ Yes ☐ No

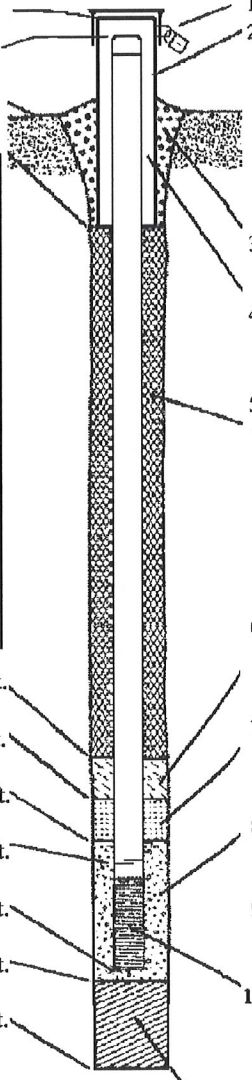
14. Drilling method used: Rotary ☐ 50 / Hollow Stem Auger ☒ 41 / Other ☐ ___

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

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

17. Source of water (attach analysis, if required):
None

E. Bentonite seal, top 609.23 ft. MSL or 0.5 ft.
F. Fine sand, top 587.73 ft. MSL or 22 ft.
G. Filter pack, top 585.73 ft. MSL or 24 ft.
H. Screen joint, top 583.73 ft. MSL or 26 ft.
I. Well bottom 578.73 ft. MSL or 31 ft.
J. Filter pack, bottom 576.73 ft. MSL or 33 ft.
K. Borehole, bottom 576.73 ft. MSL or 33 ft.
L. Borehole, diameter 8.5 in.
M. O.D. well casing 2.04 in.
N. I.D. well casing 2.0 in.



1. Cap and lock? ☒ Yes ☐ No
2. Protective cover pipe:
a. Inside diameter: ___ in.
b. Length: ___ ft.
c. Material: Steel ☒ 04 / Other ☐ ___
d. Additional protection? ☐ Yes ☐ No
If yes, describe: Steel Posts-3
3. Surface seal: Bentonite ☒ 30 / Concrete ☐ 01 / Other ☐ ___
4. Material between well casing and protective pipe: Bentonite ☐ 30 / Other ☐ ___
Ohio #5 sand
5. Annular space seal: a. Granular/Chipped Bentonite ☐ 33
b. ___ Lbs/gal mud weight . . . Bentonite-sand slurry ☐ 35
c. ___ Lbs/gal mud weight . . . . . Bentonite slurry ☐ 31
d. ___ % Bentonite . . . . . Bentonite-cement grout ☐ 50
e. ___ Ft^3 volume added for any of the above
f. How installed: Tremie ☐ 01 / Tremie pumped ☐ 02 / Gravity ☐ 08
6. Bentonite seal: a. Bentonite granules ☐ 33
b. ☐ 1/4 in. ☒ 3/8 in. ☐ 1/2 in. Bentonite chips ☑ 32
c. ___ Other ☐ ___
7. Fine sand material: Manufacturer, product name & mesh size
a. Ohio #7 sand ☐
b. Volume added 0.5 ft^3
8. Filter pack material: Manufacturer, product name & mesh size
a. Ohio #5 ☐
b. Volume added 1.5 ft^3
9. Well casing: Flush threaded PVC schedule 40 ☒ 23 / Flush threaded PVC schedule 80 ☐ 24 / Other ☐ ___
10. Screen material: sch PVC 40
a. Screen type: Factory cut ☒ 11 / Continuous slot ☐ 01 / Other ☐ ___
b. Manufacturer Monoflex
c. Slot size: 0.010 in.
d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None ☒ 14 / Other ☐ ___

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

Signature: for Kyle Kramer | Firm: SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 4-90

Route to: Solid Waste ☐ Haz. Waste ☐ Wastewater ☐
Env. Response & Repair ☐ Underground Tanks ☐ Other ☐ _____

Facility/Project Name	County Name	Well Name
WPL Edgewater Site	Sheboygan	ZB-OW
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number** / **DNR Well Number**
02524		

		Before Development	After Development
1. Can this well be purged dry?	☒ Yes ☐ No		
11. Depth to Water (from top of well casing)	a.	5.57 ft.	15.42 ft.
Date	b.	5 / 04 / 98 (m m d d y y)	5 / 08 / 98 (m m d d y y)
Time	c.	11 : 05 ☒ a.m. ☐ p.m.	10 : 45 ☒ a.m. ☐ p.m.
12. Sediment in well bottom		0.5 inches	0.0 inches
13. Water clarity		Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☒ 20 Turbid ☐ 25 (Describe)

2. Well development method

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

3. Time spent developing well: 90 min.

4. Depth of well (from top of well casisng): 16.5 ft.

5. Inside diameter of well: 2.0 in.

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

7. Volume of water removed from well: 30.0 gal.

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

9. Source of water added: _____

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

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

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

16. Additional comments on development:

Well were developed over 3 days due to slow recovery. Volume of water removed is total amount removed during the three developments.

Well developed by: Person's Name and Firm

Name: Brian Leidham

Firm: Miller Engineers + Scientists

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

Signature: Brian Leidham

Print Initials: BJL

Firm: Miller Engineers + Scientists

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-301
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well ID Number**
FID 460021980, License #02524	59	VV862	

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

2. Well development method

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

3. Time spent developing well 60 min.

4. Depth of well (from top of well casisng) 28.05 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 10.93 gal.

7. Volume of water removed from well 12.5 gal.

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

9. Source of water added NA

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 5.23 ft.	27.62 ft.
Date	b. 2/15/2016	3/7/2016
Time	c. 12:00 ☐ a.m. ☒ p.m.	10:40 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	0. inches	0. inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

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

14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-302

Facility License, Permit or Monitoring Number	County Code	Wis. Unique Well Number	DNR Well ID Number
FID 460021980, License #02524	59	VV861	

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

2. Well development method

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

3. Time spent developing well 150 min.

4. Depth of well (from top of well casisng) 36.15 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 96. gal.

7. Volume of water removed from well 135.0 gal.

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

9. Source of water added NA

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 19.14 ft.	____. ft.
Date	b. 2/15/2016 (m m d d y y y y)	2/15/2016 (m m d d y y y y)
Time	c. 1:35 ☐ a.m. ☒ p.m.	4:05 ☐ a.m. ☒ p.m.
12. Sediment in well bottom	___. inches	___. inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)

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

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

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

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

State of Wisconsin
Department of Natural Resources

MONITORING WELL DEVELOPMENT

Form 4400-113B Rev. 7-98

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

Facility/Project Name	County Name	Well Name
WPL-Edgewater Generating Station	Sheyboygan	MW-303
Facility License, Permit or Monitoring Number	**County Code**	**Wis. Unique Well Number**	**DNR Well ID Number**
FID 460021980, License #02524	59	VV860	

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

2. Well development method

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

3. Time spent developing well 70 min.

4. Depth of well (from top of well casisng) 33.15 ft.

5. Inside diameter of well 2.0 in.

6. Volume of water in filter pack and well casing 8.03 gal.

7. Volume of water removed from well 23.0 gal.

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

9. Source of water added NA

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

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. 23.41 ft.	33.1 ft.
Date	b. 2/4/2016 (mm/dd/yyyy)	3/7/2016 (mm/dd/yyyy)
Time	c. 1:00 ☐ a.m. ☒ p.m.	10:15 ☒ a.m. ☐ p.m.
12. Sediment in well bottom	____.__ inches	____.__ inches
13. Water clarity	Clear ☐ 10 Turbid ☒ 15 (Describe)	Clear ☐ 20 Turbid ☒ 25 (Describe)
14. Total suspended solids	____.__ mg/l	____.__ mg/l
15. COD	____.__ mg/l	____.__ mg/l

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

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

17. Additional comments on development:

Name and Address of Facility Contact /Owner/Responsible Party
First Name: Jim Last Name: Jakubiak
Facility/Firm: Wisconsin Power and Light
Street: 3739 Lakeshore Drive
City/State/Zip: Sheyboygan,WI 53081

I hereby certify that the above information is true and correct to the best of my knowledge.
Signature: [signature]
Print Name: Meghan Blodgett for Kyle Kramer
Firm: SCS ENGINEERS

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

Appendix C

Laboratory Reports

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

November 10, 2022

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on October 07, 2022. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay

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

Sincerely,

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

Enclosures

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

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

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

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40252795001	**MW-301**	Water	10/06/22 11:30	10/07/22 10:00
40252795002	**MW-302**	Water	10/06/22 14:15	10/07/22 10:00
40252795003	**MW-303**	Water	10/06/22 13:15	10/07/22 10:00
40252795004	**FIELD BLANK**	Water	10/06/22 12:20	10/07/22 10:00
40252795005	**2R-OW**	Water	10/06/22 10:05	10/07/22 10:00

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

SAMPLE ANALYTE COUNT

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40252795001	**MW-301**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		SM 4500-H+B	YER	1
		EPA 300.0	HMB	3
40252795002	**MW-302**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		SM 4500-H+B	YER	1
		EPA 300.0	HMB	3
40252795003	**MW-303**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		SM 4500-H+B	YER	1
		EPA 300.0	HMB	3
40252795004	**FIELD BLANK**	EPA 6020B	KXS	2
		SM 2540C	SRK	1
		SM 4500-H+B	YER	1
		EPA 300.0	HMB	3
40252795005	**2R-OW**	EPA 6020B	KXS	2
			KPR	7
		SM 2540C	SRK	1
		SM 4500-H+B	YER	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

REPORT OF LABORATORY ANALYSIS

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

SUMMARY OF DETECTION

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40252795001	**MW-301**					
EPA 6020B	Boron	6230	ug/L	200	11/09/22 08:00	
EPA 6020B	Calcium	86900	ug/L	254	11/08/22 18:32	
	Field pH	7.56	Std. Units		10/06/22 11:30	
	Field Specific Conductance	804	umhos/cm		10/06/22 11:30	
	Oxygen, Dissolved	0.39	mg/L		10/06/22 11:30	
	REDOX	-41.7	mV		10/06/22 11:30	
	Turbidity	20.7	NTU		10/06/22 11:30	
	Static Water Level	590.21	feet		10/06/22 11:30	
	Temperature, Water (C)	11.6	deg C		10/06/22 11:30	
SM 2540C	Total Dissolved Solids	572	mg/L	20.0	10/11/22 15:35	
SM 4500-H+B	pH at 25 Degrees C	7.6	Std. Units	0.10	10/24/22 10:43	H6
EPA 300.0	Chloride	15.5	mg/L	2.0	10/17/22 16:56	
EPA 300.0	Fluoride	0.21J	mg/L	0.32	10/17/22 16:56	
EPA 300.0	Sulfate	213	mg/L	20.0	10/19/22 03:21	
40252795002	**MW-302**					
EPA 6020B	Boron	1610	ug/L	100	11/09/22 09:21	
EPA 6020B	Calcium	64000	ug/L	254	11/08/22 18:40	
	Field pH	7.89	Std. Units		10/06/22 14:15	
	Field Specific Conductance	499	umhos/cm		10/06/22 14:15	
	Oxygen, Dissolved	0.61	mg/L		10/06/22 14:15	
	REDOX	105.4	mV		10/06/22 14:15	
	Turbidity	21.9	NTU		10/06/22 14:15	
	Static Water Level	599.41	feet		10/06/22 14:15	
	Temperature, Water (C)	12.1	deg C		10/06/22 14:15	
SM 2540C	Total Dissolved Solids	306	mg/L	20.0	10/11/22 15:36	
SM 4500-H+B	pH at 25 Degrees C	7.8	Std. Units	0.10	10/24/22 10:47	H6
EPA 300.0	Chloride	21.2	mg/L	2.0	10/17/22 17:11	
EPA 300.0	Fluoride	0.87	mg/L	0.32	10/17/22 17:11	
EPA 300.0	Sulfate	70.5	mg/L	10.0	10/19/22 03:35	
40252795003	**MW-303**					
EPA 6020B	Boron	3650	ug/L	200	11/09/22 09:28	
EPA 6020B	Calcium	135000	ug/L	254	11/08/22 18:47	
	Field pH	6.92	Std. Units		10/06/22 13:15	
	Field Specific Conductance	1184	umhos/cm		10/06/22 13:15	
	Oxygen, Dissolved	1.31	mg/L		10/06/22 13:15	
	REDOX	175.4	mV		10/06/22 13:15	
	Turbidity	165	NTU		10/06/22 13:15	
	Static Water Level	593.63	feet		10/06/22 13:15	
	Temperature, Water (C)	11.8	deg C		10/06/22 13:15	
SM 2540C	Total Dissolved Solids	658	mg/L	20.0	10/11/22 15:36	
SM 4500-H+B	pH at 25 Degrees C	6.8	Std. Units	0.10	10/24/22 10:49	H6
EPA 300.0	Chloride	22.0	mg/L	2.0	10/17/22 17:26	
40252795004	**FIELD BLANK**					
EPA 6020B	Calcium	148J	ug/L	254	11/08/22 17:04	
SM 4500-H+B	pH at 25 Degrees C	6.4	Std. Units	0.10	10/24/22 10:53	H6

REPORT OF LABORATORY ANALYSIS

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

SUMMARY OF DETECTION

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
40252795005	**2R-OW**					
EPA 6020B	Boron	49.0	ug/L	10.0	11/08/22 18:54	
EPA 6020B	Calcium	152000	ug/L	254	11/08/22 18:54	
	Field pH	7.08	Std. Units		10/06/22 10:05	
	Field Specific Conductance	1992	umhos/cm		10/06/22 10:05	
	Oxygen, Dissolved	1.06	mg/L		10/06/22 10:05	
	REDOX	522.7	mV		10/06/22 10:05	
	Turbidity	2.75	NTU		10/06/22 10:05	
	Static Water Level	602.80	feet		10/06/22 10:05	
	Temperature, Water (C)	13.6	deg C		10/06/22 10:05	
SM 2540C	Total Dissolved Solids	1110	mg/L	20.0	10/11/22 15:36	
SM 4500-H+B	pH at 25 Degrees C	7.1	Std. Units	0.10	10/24/22 10:56	H6
EPA 300.0	Chloride	414	mg/L	40.0	10/26/22 20:43	
EPA 300.0	Sulfate	28.0	mg/L	2.0	10/25/22 12:42	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Sample: MW-301 **Lab ID: 40252795001** Collected: 10/06/22 11:30 Received: 10/07/22 10:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**6230**	ug/L	200	60.6	20	11/02/22 05:06	11/09/22 08:00	7440-42-8	
Calcium	**86900**	ug/L	254	76.2	1	11/02/22 05:06	11/08/22 18:32	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.56**	Std. Units			1		10/06/22 11:30		
Field Specific Conductance	**804**	umhos/cm			1		10/06/22 11:30		
Oxygen, Dissolved	**0.39**	mg/L			1		10/06/22 11:30	7782-44-7	
REDOX	**-41.7**	mV			1		10/06/22 11:30		
Turbidity	**20.7**	NTU			1		10/06/22 11:30		
Static Water Level	**590.21**	feet			1		10/06/22 11:30		
Temperature, Water (C)	**11.6**	deg C			1		10/06/22 11:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**572**	mg/L	20.0	8.7	1		10/11/22 15:35		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.6**	Std. Units	0.10	0.010	1		10/24/22 10:43		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**15.5**	mg/L	2.0	0.43	1		10/17/22 16:56	16887-00-6	
Fluoride	**0.21J**	mg/L	0.32	0.095	1		10/17/22 16:56	16984-48-8	
Sulfate	**213**	mg/L	20.0	4.4	10		10/19/22 03:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Sample: MW-302 **Lab ID: 40252795002** Collected: 10/06/22 14:15 Received: 10/07/22 10:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**1610**	ug/L	100	30.3	10	11/02/22 05:06	11/09/22 09:21	7440-42-8	
Calcium	**64000**	ug/L	254	76.2	1	11/02/22 05:06	11/08/22 18:40	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.89**	Std. Units			1		10/06/22 14:15		
Field Specific Conductance	**499**	umhos/cm			1		10/06/22 14:15		
Oxygen, Dissolved	**0.61**	mg/L			1		10/06/22 14:15	7782-44-7	
REDOX	**105.4**	mV			1		10/06/22 14:15		
Turbidity	**21.9**	NTU			1		10/06/22 14:15		
Static Water Level	**599.41**	feet			1		10/06/22 14:15		
Temperature, Water (C)	**12.1**	deg C			1		10/06/22 14:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**306**	mg/L	20.0	8.7	1		10/11/22 15:36		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.8**	Std. Units	0.10	0.010	1		10/24/22 10:47		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**21.2**	mg/L	2.0	0.43	1		10/17/22 17:11	16887-00-6	
Fluoride	**0.87**	mg/L	0.32	0.095	1		10/17/22 17:11	16984-48-8	
Sulfate	**70.5**	mg/L	10.0	2.2	5		10/19/22 03:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Sample: MW-303 **Lab ID: 40252795003** Collected: 10/06/22 13:15 Received: 10/07/22 10:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**3650**	ug/L	200	60.6	20	11/02/22 05:06	11/09/22 09:28	7440-42-8	
Calcium	**135000**	ug/L	254	76.2	1	11/02/22 05:06	11/08/22 18:47	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.92**	Std. Units			1		10/06/22 13:15		
Field Specific Conductance	**1184**	umhos/cm			1		10/06/22 13:15		
Oxygen, Dissolved	**1.31**	mg/L			1		10/06/22 13:15	7782-44-7	
REDOX	**175.4**	mV			1		10/06/22 13:15		
Turbidity	**165**	NTU			1		10/06/22 13:15		
Static Water Level	**593.63**	feet			1		10/06/22 13:15		
Temperature, Water (C)	**11.8**	deg C			1		10/06/22 13:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**658**	mg/L	20.0	8.7	1		10/11/22 15:36		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.8**	Std. Units	0.10	0.010	1		10/24/22 10:49		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**22.0**	mg/L	2.0	0.43	1		10/17/22 17:26	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/17/22 17:26	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/17/22 17:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Sample: FIELD BLANK **Lab ID: 40252795004** Collected: 10/06/22 12:20 Received: 10/07/22 10:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	11/02/22 05:06	11/08/22 17:04	7440-42-8	
Calcium	**148J**	ug/L	254	76.2	1	11/02/22 05:06	11/08/22 17:04	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		10/11/22 15:36		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**6.4**	Std. Units	0.10	0.010	1		10/24/22 10:53		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		10/25/22 12:27	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/25/22 12:27	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		10/25/22 12:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Sample: 2R-OW **Lab ID: 40252795005** Collected: 10/06/22 10:05 Received: 10/07/22 10:00 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**49.0**	ug/L	10.0	3.0	1	11/02/22 05:06	11/08/22 18:54	7440-42-8	
Calcium	**152000**	ug/L	254	76.2	1	11/02/22 05:06	11/08/22 18:54	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.08**	Std. Units			1		10/06/22 10:05		
Field Specific Conductance	**1992**	umhos/cm			1		10/06/22 10:05		
Oxygen, Dissolved	**1.06**	mg/L			1		10/06/22 10:05	7782-44-7	
REDOX	**522.7**	mV			1		10/06/22 10:05		
Turbidity	**2.75**	NTU			1		10/06/22 10:05		
Static Water Level	**602.80**	feet			1		10/06/22 10:05		
Temperature, Water (C)	**13.6**	deg C			1		10/06/22 10:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**1110**	mg/L	20.0	8.7	1		10/11/22 15:36		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.010	1		10/24/22 10:56		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**414**	mg/L	40.0	8.6	20		10/26/22 20:43	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		10/25/22 12:42	16984-48-8	
Sulfate	**28.0**	mg/L	2.0	0.44	1		10/25/22 12:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

QC Batch: 430368
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40252795001, 40252795002, 40252795003, 40252795004, 40252795005

METHOD BLANK: 2478487 Matrix: Water
Associated Lab Samples: 40252795001, 40252795002, 40252795003, 40252795004, 40252795005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	11/08/22 16:34	
Calcium	ug/L	<76.2	254	11/08/22 16:34	

LABORATORY CONTROL SAMPLE: 2478488

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	250	217	87	80-120	
Calcium	ug/L	10000	9350	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2478489 2478490

Parameter	Units	40252910001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	322	250	250	568	536	98	85	75-125	6	20	
Calcium	ug/L	40900	10000	10000	51400	50500	105	96	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

QC Batch: 428466 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40252795001, 40252795002, 40252795003, 40252795004, 40252795005

METHOD BLANK: 2467522 Matrix: Water
Associated Lab Samples: 40252795001, 40252795002, 40252795003, 40252795004, 40252795005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/11/22 15:33	

LABORATORY CONTROL SAMPLE: 2467523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	587	532	91	80-120	

SAMPLE DUPLICATE: 2467524

Parameter	Units	40252811001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	258	248	4	10	

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

QC Batch: 429532
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40252795001, 40252795002, 40252795003, 40252795004, 40252795005

SAMPLE DUPLICATE: 2474186

Parameter	Units	40252716010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	5	H6

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

QC Batch: 428801
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40252795001, 40252795002, 40252795003

METHOD BLANK: 2469796 Matrix: Water
Associated Lab Samples: 40252795001, 40252795002, 40252795003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/17/22 12:29	
Fluoride	mg/L	<0.095	0.32	10/17/22 12:29	
Sulfate	mg/L	<0.44	2.0	10/17/22 12:29	

LABORATORY CONTROL SAMPLE: 2469797

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.4	102	90-110	
Fluoride	mg/L	2	2.0	98	90-110	
Sulfate	mg/L	20	20.2	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2469798 2469799

Parameter	Units	40252730007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.0	20	20	32.6	32.7	108	109	90-110	0	15	
Fluoride	mg/L	1.0	2	2	3.1	3.1	101	102	90-110	1	15	
Sulfate	mg/L	144	200	200	345	342	100	99	90-110	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2469800 2469801

Parameter	Units	40252798015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1230	1000	1000	2220	2220	99	99	90-110	0	15	
Sulfate	mg/L	<22.2	1000	1000	1110	1110	111	111	90-110	0	15	M0

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QUALITY CONTROL DATA

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

QC Batch: 429462
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40252795004, 40252795005

METHOD BLANK: 2473530 Matrix: Water
Associated Lab Samples: 40252795004, 40252795005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/25/22 11:58	
Fluoride	mg/L	<0.095	0.32	10/25/22 11:58	
Sulfate	mg/L	<0.44	2.0	10/25/22 11:58	

LABORATORY CONTROL SAMPLE: 2473531

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	19.6	98	90-110	
Fluoride	mg/L	2	1.8	92	90-110	
Sulfate	mg/L	20	19.5	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2473532 2473533

Parameter	Units	40253245001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	266	200	200	444	498	89	116	90-110	11	15	M0
Fluoride	mg/L	<0.95	20	20	21.4	21.1	107	106	90-110	1	15	
Sulfate	mg/L	50.0	200	200	264	272	107	111	90-110	3	15	M0

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2473534 2473535

Parameter	Units	40253482001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	649	400	400	1040	1020	97	94	90-110	1	15	
Fluoride	mg/L	32.8	40	40	82.9	81.6	125	122	90-110	2	15	M0
Sulfate	mg/L	20.8J	400	400	459	459	109	109	90-110	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: CCR RULE EDGEWATER I-4 CLOSED
Pace Project No.: 40252795

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40252795001	**MW-301**	EPA 3010A	430368	EPA 6020B	430436
40252795002	**MW-302**	EPA 3010A	430368	EPA 6020B	430436
40252795003	**MW-303**	EPA 3010A	430368	EPA 6020B	430436
40252795004	**FIELD BLANK**	EPA 3010A	430368	EPA 6020B	430436
40252795005	**2R-OW**	EPA 3010A	430368	EPA 6020B	430436
40252795001	**MW-301**				
40252795002	**MW-302**				
40252795003	**MW-303**				
40252795005	**2R-OW**				
40252795001	**MW-301**	SM 2540C	428466		
40252795002	**MW-302**	SM 2540C	428466		
40252795003	**MW-303**	SM 2540C	428466		
40252795004	**FIELD BLANK**	SM 2540C	428466		
40252795005	**2R-OW**	SM 2540C	428466		
40252795001	**MW-301**	SM 4500-H+B	429532		
40252795002	**MW-302**	SM 4500-H+B	429532		
40252795003	**MW-303**	SM 4500-H+B	429532		
40252795004	**FIELD BLANK**	SM 4500-H+B	429532		
40252795005	**2R-OW**	SM 4500-H+B	429532		
40252795001	**MW-301**	EPA 300.0	428801		
40252795002	**MW-302**	EPA 300.0	428801		
40252795003	**MW-303**	EPA 300.0	428801		
40252795004	**FIELD BLANK**	EPA 300.0	429462		
40252795005	**2R-OW**	EPA 300.0	429462		

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

40252795

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

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

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: SCS ENGINEERS	Report To: Meghan Blodgett	Attention:	
Address: 2830 Dairy Drive	Copy To:	Company Name:	Regulatory Agency
Madison, WI 53718		Address:	
Email: mblodgett@scsengineers.com	Purchase Order #:	Pace Quote:	
Phone: 608-216-7362 Fax	Project Name: CCR Rule Edgewater I-4 Closed (25216068)	Pace Project Manager: dan.milewsky@pacelabs.com,	State / Location
Requested Due Date:	Project #:	Pace Profile #: 3946-13	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals	pH	TDS by 160.1	Residual Chlorine (Y/N)	
1	MW-301	WT		10/6	1130				3	2	1	1							X	X	X		001
2	MW-302	WT		10/6	1415														X	X	X		002
3	MW-303	WT		10/6	1315														X	X	X		003
4	FIELD BLANK	WT		10/6	1220														X	X	X		004
5	2R-OW	WT		10/6	1005														X	X	X		005
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
ALL SAMPLES UNFILTERED, metals=Calcium/boron		10/6/22	1630							
	CS Logistics	10/7/22	1000	Thuy Pham	10/7/22	1000	35	Y	N	Y

SAMPLER NAME AND SIGNATURE		TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Michael Krout				
SIGNATURE of SAMPLER:	DATE Signed: 10/6/22				

Client Name: SCS Engineers

Sample Preservation Receipt Form

Project # LH852795

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

Lab Lot# of pH paper: 10D3111 Lab Std #ID of preservation (if pH adjusted):

Initial when completed: TP Date/ Time:

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

VP 10/7/22

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

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

Page 1 of 2

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO# : 40252795

40252795

Client Name: SCS Engineers

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

Tracking #: —

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

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

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

Thermometer Used SR - 118 **Type of Ice:** (Wet) Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 3 /Corr: 3.5

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

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

Person examining contents:
Date: 10/7/22 /Initials: TP

Labeled By Initials: AZJ

Chain of Custody Present:	☑Yes ☐No ☐N/A	1.
Chain of Custody Filled Out: 101722 AZJ	☑Yes ☐No ☐N/A	2. no proj. # 101722 AZJ
Chain of Custody Relinquished:	☑Yes ☐No ☐N/A	3.
Sampler Name & Signature on COC:	☑Yes ☐No ☐N/A	4.
Samples Arrived within Hold Time:	☑Yes ☐No	5.
- DI VOA Samples frozen upon receipt	☐Yes ☐No	Date/Time:
Short Hold Time Analysis (<72hr):	☐Yes ☑No	6.
Rush Turn Around Time Requested:	☐Yes ☑No	7.
Sufficient Volume: For Analysis: ☑Yes ☐No MS/MSD: ☐Yes ☑No ☐N/A		8.
Correct Containers Used:	☑Yes ☐No	9.
Correct Type: Pace Green Bay, Pace IR, Non-Pace		
Containers Intact:	☑Yes ☐No	10.
Filtered volume received for Dissolved tests	☐Yes ☐No ☑N/A	11.
Sample Labels match COC: -Includes date/time/ID/Analysis Matrix: W	☑Yes ☐No ☐N/A	12.
Trip Blank Present:	☐Yes ☐No ☑N/A	13.
Trip Blank Custody Seals Present	☐Yes ☐No ☑N/A	
Pace Trip Blank Lot # (if purchased): _____		

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

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

July 05, 2023

Meghan Blodgett
SCS ENGINEERS
2830 Dairy Drive
Madison, WI 53718

RE: Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Dear Meghan Blodgett:

Enclosed are the analytical results for sample(s) received by the laboratory on April 27, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Green Bay

Revised Report: The field data has been updated for MW-302 and MW-303.

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

Sincerely,

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

Enclosures

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

Pace Analytical Services, LLC
1241 Bellevue Street - Suite 9
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CERTIFICATIONS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

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

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40261411001	**2R-OW**	Water	04/26/23 11:30	04/27/23 09:15
40261411002	**MW-301**	Water	04/25/23 13:50	04/27/23 09:15
40261411003	**MW-302**	Water	04/26/23 10:10	04/27/23 09:15
40261411004	**MW-303**	Water	04/25/23 15:35	04/27/23 09:15
40261411005	**FIELD BLANK**	Water	04/25/23 14:30	04/27/23 09:15

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Green Bay, WI 54302
(920)469-2436

SAMPLE ANALYTE COUNT

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40261411001	**2R-OW**	EPA 6020B	KXS	2
			AG1	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40261411002	**MW-301**	EPA 6020B	KXS, TXW	2
			AG1	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40261411003	**MW-302**	EPA 6020B	KXS	2
			AG1	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40261411004	**MW-303**	EPA 6020B	KXS, TXW	2
			AG1	7
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3
40261411005	**FIELD BLANK**	EPA 6020B	KXS	2
		SM 2540C	SRK	1
		EPA 9040	YER	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

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

ANALYTICAL RESULTS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Sample: 2R-OW **Lab ID: 40261411001** Collected: 04/26/23 11:30 Received: 04/27/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**32.0**	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 20:39	7440-42-8	
Calcium	**91800**	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 20:39	7440-70-2	P6
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.30**	Std. Units			1		04/26/23 11:30		
Field Specific Conductance	**889**	umhos/cm			1		04/26/23 11:30		
Oxygen, Dissolved	**0.90**	mg/L			1		04/26/23 11:30	7782-44-7	
REDOX	**306.2**	mV			1		04/26/23 11:30		
Turbidity	**3.62**	NTU			1		04/26/23 11:30		
Static Water Level	**607.74**	feet			1		04/26/23 11:30		
Temperature, Water (C)	**6.9**	deg C			1		04/26/23 11:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**512**	mg/L	20.0	8.7	1		04/28/23 15:35		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.4**	Std. Units	0.10	0.010	1		05/02/23 09:01		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**53.4**	mg/L	2.0	0.43	1		05/10/23 12:52	16887-00-6	
Fluoride	**0.11J**	mg/L	0.32	0.095	1		05/10/23 12:52	16984-48-8	
Sulfate	**7.5**	mg/L	2.0	0.44	1		05/10/23 12:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Sample: MW-301 **Lab ID: 40261411002** Collected: 04/25/23 13:50 Received: 04/27/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**6770**	ug/L	200	60.6	20	05/02/23 05:28	05/11/23 16:50	7440-42-8	
Calcium	**87900**	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 21:23	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.63**	Std. Units			1		04/25/23 13:50		
Field Specific Conductance	**765**	umhos/cm			1		04/25/23 13:50		
Oxygen, Dissolved	**3.14**	mg/L			1		04/25/23 13:50	7782-44-7	
REDOX	**416.4**	mV			1		04/25/23 13:50		
Turbidity	**96.1**	NTU			1		04/25/23 13:50		
Static Water Level	**597.77**	feet			1		04/25/23 13:50		
Temperature, Water (C)	**8.5**	deg C			1		04/25/23 13:50		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**554**	mg/L	20.0	8.7	1		04/28/23 15:35		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.7**	Std. Units	0.10	0.010	1		05/02/23 09:22		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**17.9**	mg/L	2.0	0.43	1		05/10/23 04:47	16887-00-6	
Fluoride	**0.21J**	mg/L	0.32	0.095	1		05/10/23 04:47	16984-48-8	
Sulfate	**168**	mg/L	20.0	4.4	10		05/10/23 13:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Sample: MW-302 **Lab ID: 40261411003** Collected: 04/26/23 10:10 Received: 04/27/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**1450**	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 21:38	7440-42-8	
Calcium	**46900**	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 21:38	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**7.85**	Std. Units			1		04/26/23 10:10		
Field Specific Conductance	**501**	umhos/cm			1		04/26/23 10:10		
Oxygen, Dissolved	**1.86**	mg/L			1		04/26/23 10:10	7782-44-7	
REDOX	**169.1**	mV			1		04/26/23 10:10		
Turbidity	**3.1**	NTU			1		04/26/23 10:10		
Static Water Level	**593.63**	feet			1		04/26/23 10:10		
Temperature, Water (C)	**8.7**	deg C			1		04/26/23 10:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**344**	mg/L	20.0	8.7	1		04/28/23 15:35		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**8.0**	Std. Units	0.10	0.010	1		05/02/23 09:33		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**16.5**	mg/L	2.0	0.43	1		05/10/23 05:02	16887-00-6	
Fluoride	**0.75**	mg/L	0.32	0.095	1		05/10/23 05:02	16984-48-8	
Sulfate	**75.4**	mg/L	10.0	2.2	5		05/10/23 13:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Sample: MW-303 **Lab ID: 40261411004** Collected: 04/25/23 15:35 Received: 04/27/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**4870**	ug/L	200	60.6	20	05/02/23 05:28	05/11/23 17:05	7440-42-8	
Calcium	**128000**	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 21:45	7440-70-2	
Field Data	Analytical Method: Pace Analytical Services - Green Bay								
Field pH	**6.87**	Std. Units			1		04/25/23 15:35		
Field Specific Conductance	**1230**	umhos/cm			1		04/25/23 15:35		
Oxygen, Dissolved	**5.27**	mg/L			1		04/25/23 15:35	7782-44-7	
REDOX	**370.4**	mV			1		04/25/23 15:35		
Turbidity	**44.1**	NTU			1		04/25/23 15:35		
Static Water Level	**587.99**	feet			1		04/25/23 15:35		
Temperature, Water (C)	**8.0**	deg C			1		04/25/23 15:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**740**	mg/L	20.0	8.7	1		04/28/23 15:35		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.010	1		05/02/23 09:42		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**22.3**	mg/L	2.0	0.43	1		05/10/23 05:16	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/23 05:16	16984-48-8	
Sulfate	**0.50J**	mg/L	2.0	0.44	1		05/10/23 05:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Sample: FIELD BLANK **Lab ID: 40261411005** Collected: 04/25/23 14:30 Received: 04/27/23 09:15 Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
6020B MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Green Bay								
Boron	**<3.0**	ug/L	10.0	3.0	1	05/02/23 05:28	05/10/23 19:18	7440-42-8	
Calcium	**<76.2**	ug/L	254	76.2	1	05/02/23 05:28	05/10/23 19:18	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Green Bay								
Total Dissolved Solids	**<8.7**	mg/L	20.0	8.7	1		04/28/23 15:35		
9040 pH	Analytical Method: EPA 9040 Pace Analytical Services - Green Bay								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.010	1		05/02/23 09:57		H6
300.0 IC Anions	Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay								
Chloride	**<0.43**	mg/L	2.0	0.43	1		05/10/23 05:31	16887-00-6	
Fluoride	**<0.095**	mg/L	0.32	0.095	1		05/10/23 05:31	16984-48-8	
Sulfate	**<0.44**	mg/L	2.0	0.44	1		05/10/23 05:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

QC Batch: 443772
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020B MET
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

METHOD BLANK: 2547952 Matrix: Water
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

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

LABORATORY CONTROL SAMPLE: 2547953

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2547954 2547955

Parameter	Units	40261411001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	32.0	250	250	249	245	87	85	75-125	2	20	
Calcium	ug/L	91800	10000	10000	104000	105000	124	132	75-125	1	20	P6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

QC Batch: 443595 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

METHOD BLANK: 2547072 Matrix: Water
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/28/23 15:33	

LABORATORY CONTROL SAMPLE: 2547073

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	582	548	94	80-120	

SAMPLE DUPLICATE: 2547074

Parameter	Units	40261401001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	840	824	2	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

QC Batch: 443778
QC Batch Method: EPA 9040
Analysis Method: EPA 9040
Analysis Description: 9040 pH
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

SAMPLE DUPLICATE: 2547973

Parameter	Units	40261401001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	8.0	1	20	H6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

QC Batch: 444301 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Green Bay
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

METHOD BLANK: 2550762 Matrix: Water
Associated Lab Samples: 40261411001, 40261411002, 40261411003, 40261411004, 40261411005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	05/10/23 00:19	
Fluoride	mg/L	<0.095	0.32	05/10/23 00:19	
Sulfate	mg/L	<0.44	2.0	05/10/23 00:19	

LABORATORY CONTROL SAMPLE: 2550763

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	18.5	92	90-110	
Fluoride	mg/L	2	1.9	94	90-110	
Sulfate	mg/L	20	18.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550764 2550765

Parameter	Units	40261368001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	286	400	400	682	684	99	99	90-110	0	15	
Fluoride	mg/L	<1.9	40	40	42.2	42.4	105	106	90-110	1	15	
Sulfate	mg/L	276	400	400	669	672	98	99	90-110	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2550766 2550767

Parameter	Units	40261416004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.2	20	20	23.1	23.2	105	105	90-110	0	15	
Fluoride	mg/L	0.52	2	2	2.6	2.6	104	105	90-110	0	15	
Sulfate	mg/L	15.6	20	20	36.2	36.2	103	103	90-110	0	15	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

DEFINITIONS

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

ND - Not Detected at or above LOD.

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

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

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

DL - Adjusted Method Detection Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

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.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25223068 EDGEWATER CCR
Pace Project No.: 40261411

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40261411001	**2R-OW**	EPA 3010A	443772	EPA 6020B	443833
40261411002	**MW-301**	EPA 3010A	443772	EPA 6020B	443833
40261411003	**MW-302**	EPA 3010A	443772	EPA 6020B	443833
40261411004	**MW-303**	EPA 3010A	443772	EPA 6020B	443833
40261411005	**FIELD BLANK**	EPA 3010A	443772	EPA 6020B	443833
40261411001	**2R-OW**				
40261411002	**MW-301**				
40261411003	**MW-302**				
40261411004	**MW-303**				
40261411001	**2R-OW**	SM 2540C	443595		
40261411002	**MW-301**	SM 2540C	443595		
40261411003	**MW-302**	SM 2540C	443595		
40261411004	**MW-303**	SM 2540C	443595		
40261411005	**FIELD BLANK**	SM 2540C	443595		
40261411001	**2R-OW**	EPA 9040	443778		
40261411002	**MW-301**	EPA 9040	443778		
40261411003	**MW-302**	EPA 9040	443778		
40261411004	**MW-303**	EPA 9040	443778		
40261411005	**FIELD BLANK**	EPA 9040	443778		
40261411001	**2R-OW**	EPA 300.0	444301		
40261411002	**MW-301**	EPA 300.0	444301		
40261411003	**MW-302**	EPA 300.0	444301		
40261411004	**MW-303**	EPA 300.0	444301		
40261411005	**FIELD BLANK**	EPA 300.0	444301		

40261411

Pace

CHAIN-OF-CUSTODY / Analytical Request Document

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

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

Page : 1 Of 1

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	
Company: SCS ENGINEERS	Report To Meghan Blodgett	Attention	
Address. 2830 Dairy Drive	Copy To	Company Name:	Regulatory Agency
Madison, WI 53718		Address:	
Email. mblodgett@scsengineers.com	Purchase Order #:	Pace Quote.	
Phone 608-216-7362 Fax	Project Name. 25223068 Edgewater	Pace Project Manager: dan milewsky@pacelabs.com,	State / Location
Requested Due Date. Standard TAT	Project #. 25223068	Pace Profile #:	WI

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	Metals, Total (B, Ca)	Chloride, Fluoride, Sulfate, total	TDS	pH	Residual Chlorine (Y/N)	
	MATRIX: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Other OT; Tissue TS																	Requested Analysis Filtered (Y/N)	N	N	N	N		
1	2R-OW	WT		4/26	11:30				3	2		1							X	X	X	X		001
2	MW-301	WT		4/25	13:50														X	X	X	X		002
3	MW-302	WT		4/26	10:10														X	X	X	X		003
4	MW-303	WT		4/25	15:35														X	X	X	X		004
5	FIELD BLANK	WT		4/25	14:30				V	V		V							X	X	X	X		005
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	William Ouimet SCS	4/26	16:00							
	CSLogistics	4/27/23	0915	Angel R. Zeo Pace	4/27/23	0915	1.0	Y	N	Y
							TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE		
PRINT Name of SAMPLER:	William Ouimet	
SIGNATURE of SAMPLER:	William Ouimet	DATE Signed: 4/26/23

Sample Preservation Receipt Form

Client Name: SCS Engineers Project # 402601411

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

Lab Lot# of pH paper: 10D0722 Lab Std #ID of preservation (if pH adjusted)

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

4/27/23 dRA

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

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

Sample Condition Upon Receipt Form (SCUR)

Project #:

WO#: 40261411

40261411

Client Name: SCS Engineers

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

Tracking #: _____

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

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

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☒ Other Ziploc Bags.

Thermometer Used SR - 129 **Type of Ice:** Wet Blue Dry None ☐ Meltwater Only

Cooler Temperature Uncorr: 1.0 /Corr: 1.0

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

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

Person examining contents:
Date: 4/27/23 Initials: dRd

Labeled By Initials: MTC

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

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

Page 2 of 2

Appendix D

Historical Monitoring Results

Single Location
Name: WPL - Edgewater
Closed

Location ID: 2R-OW
Number of Sampling Dates: 20

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/1/2017
Boron	ug/L	100	22.4	32.6	43.1	31.2	70.6	45.2	35.7
Calcium	ug/L	205000	148000	145000	155000	152000	143000	145000	164000
Chloride	mg/L	91.7	232	215	217	201	102	115	272
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Field pH	Std. Units	7.34	7.02	6.1	6.98	7.15	7.01	6.86	7
Sulfate	mg/L	19.5	28	25.4	21.6	23.9	17.6	17.8	28.8
Total Dissolved Solids	mg/L	774	908	974	944	854	750	744	1000
Antimony	ug/L	0.3	<0.073	<0.073	<0.073	0.073	<0.073	0.32	<0.15
Arsenic	ug/L	5.2	0.34	0.39	0.39	0.65	0.35	0.71	1.2
Barium	ug/L	344	110	155	189	158	150	172	154
Beryllium	ug/L	0.83	<0.13	<0.13	<0.13	<0.13	<0.13	<0.18	<0.18
Cadmium	ug/L	0.21	<0.089	<0.089	<0.089	<0.089	<0.089	0.2	<0.081
Chromium	ug/L	23.6	3.1	2.9	1.7	2.6	2.2	1.6	4.3
Cobalt	ug/L	6	0.081	0.05	0.21	0.22	0.28	0.7	1.7
Lead	ug/L	13	0.17	0.14	0.074	0.38	0.48	0.4	1.2
Lithium	ug/L	19.6	9.6	9	8.2	8.2	5.3	6.2	15.1
Molybdenum	ug/L	0.58	0.28	0.32	0.25	0.28	0.5	0.54	0.44
Selenium	ug/L	2.2	<0.21	<0.21	<0.21	<0.21	<0.21	0.34	<0.32
Thallium	ug/L	0.19	<0.14	<0.14	<0.14	<0.14	<0.14	0.45	<0.14
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Total Radium	pCi/L	0.945	0.815	0.432	0.896	0.627	1.02	1.58	2.12
pH at 25 Degrees C	Std. Units	7.4	7.4	7	7.4	7.4	7.1	6.9	7.1
Radium-226	pCi/L	0.304	0.433	0.0836	0.193	0	0.418	0.531	0.658
Radium-228	pCi/L	0.641	0.382	0.348	0.703	0.627	0.605	1.05	0.502
Field Specific Conductance	umhos/cm	1332	1277	1697	1533	1579	1387	1294	1651
Oxygen, Dissolved	mg/L	4.6	0.9	1	0.6	1	0.5	0.1	0
Field Oxidation Potential	mV	130	82	140	117	87	120	-20	-22
Groundwater Elevation	feet	610.02	606.7	605.74	607.27	609.64	609.27	607.63	604.59
Temperature, Water (C)	deg C	5.6	10.6	13.9	14.1	7.5	7	10.1	13
Turbidity	NTU	612.3	10.97	3.64	3.32	11.71	16.46	0.55	41.3

Location ID: 2R-OW
Number of Sampling Dates: 20

Parameter Name	Units	10/23/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021
Boron	ug/L	55.9	19.7	34.7	35.8	58.8	52.3	29.9	45.7
Calcium	ug/L	170000	121000	190000	121000	132000	117000	124000	154000
Chloride	mg/L	305	108	462	55.3	88.8	67.5	179	116
Fluoride	mg/L	<0.1	0.12	<0.1	<0.1	<0.1	<0.095	0.096	<0.095
Field pH	Std. Units	7.23	7.29	7.03	8.57	6.88	7.08	7.2	7.52
Sulfate	mg/L	29.3	17.2	37.2	10.6	13.2	11.6	20.3	15.3
Total Dissolved Solids	mg/L	1010	680	1260	610	706	604	806	737
Antimony	ug/L	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.1	7.4	7	7.5	7.1	7.1	7.4	7.4
Radium-226	pCi/L	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1864	1177	2202	1077	1261	1081	1490	1229
Oxygen, Dissolved	mg/L	4.9	6.7	1.6	0.6	2.5	1.5	3.5	6.9
Field Oxidation Potential	mV	131	85	180	75	148	43.7	282	282
Groundwater Elevation	feet	601.74	607.87	604.61	609.5	609.39	608.97	604.27	608.5
Temperature, Water (C)	deg C	13	5.2	13.4	6.7	14	6.1	13.6	6.6
Turbidity	NTU	2.24	6.38	7.09	8.59	--	15.24	28.74	413

Location ID: 2R-OW
Number of Sampling Dates: 20

Parameter Name	Units	10/26/2021	4/13/2022	10/6/2022	4/26/2023				
Boron	ug/L	47.2	27.9	49	32				
Calcium	ug/L	192000	160000	152000	91800				
Chloride	mg/L	493	275	414	53.4				
Fluoride	mg/L	<4.8	<0.95	<0.095	0.11				
Field pH	Std. Units	7.01	7.2	7.08	7.3				
Sulfate	mg/L	35.7	18.5	28	7.5				
Total Dissolved Solids	mg/L	1170	866	1110	512				
Antimony	ug/L	--	--	--	--				
Arsenic	ug/L	--	--	--	--				
Barium	ug/L	--	--	--	--				
Beryllium	ug/L	--	--	--	--				
Cadmium	ug/L	--	--	--	--				
Chromium	ug/L	--	--	--	--				
Cobalt	ug/L	--	--	--	--				
Lead	ug/L	--	--	--	--				
Lithium	ug/L	--	--	--	--				
Molybdenum	ug/L	--	--	--	--				
Selenium	ug/L	--	--	--	--				
Thallium	ug/L	--	--	--	--				
Mercury	ug/L	--	--	--	--				
Total Radium	pCi/L	--	--	--	--				
pH at 25 Degrees C	Std. Units	7.2	7.2	7.1	7.4				
Radium-226	pCi/L	--	--	--	--				
Radium-228	pCi/L	--	--	--	--				
Field Specific Conductance	umhos/cm	2290	1549	1992	889				
Oxygen, Dissolved	mg/L	0.6	6.72	1.06	0.9				
Field Oxidation Potential	mV	242	425.6	522.7	306.2				
Groundwater Elevation	feet	604.04	609.5	602.8	607.74				
Temperature, Water (C)	deg C	14	7.5	13.6	6.9				
Turbidity	NTU	95.2	205	2.75	3.62				

Single Location
Name: WPL - Edgewater
Closed

Location ID: MW-301
Number of Sampling Dates: 21

Parameter Name	Units	4/11/2016	6/20/2016	8/9/2016	10/20/2016	1/23/2017	4/6/2017	6/6/2017	8/2/2017
Boron	ug/L	8550	8190	8450	8620	9280	8370	9160	8610
Calcium	ug/L	88700	92200	84000	89400	89200	98800	94900	83600
Chloride	mg/L	16.2	15.9	13.7	13.9	13.8	12.7	13.5	12.3
Fluoride	mg/L	0.33	0.36	0.33	0.34	0.42	0.21	<0.1	0.32
Field pH	Std. Units	7.91	7.48	6.47	7.68	8.03	7.98	7.7	7.58
Sulfate	mg/L	372	343	368	369	372	367	362	340
Total Dissolved Solids	mg/L	838	794	862	838	826	838	804	780
Antimony	ug/L	0.49	0.21	<0.073	0.083	0.2	<0.15	0.33	<0.15
Arsenic	ug/L	4.3	2.4	2.3	4.2	1.8	2.8	1.9	1.5
Barium	ug/L	48.7	32.6	30.5	31.4	32.2	53.8	30.3	28.2
Beryllium	ug/L	0.18	<0.13	<0.13	<0.13	0.28	<0.25	<0.18	<0.18
Cadmium	ug/L	0.2	0.22	<0.089	<0.089	0.17	<0.18	<0.081	<0.081
Chromium	ug/L	3.5	0.55	<0.39	0.86	1.1	6.4	<1	<1
Cobalt	ug/L	1.2	0.39	0.38	0.39	0.24	1.5	0.24	0.2
Lead	ug/L	2.2	0.3	<0.04	0.29	0.47	2.1	0.28	0.29
Lithium	ug/L	21.4	14.2	15.6	15.8	16.3	20.6	17	15.8
Molybdenum	ug/L	2200	2040	2160	2300	2210	2090	2460	2070
Selenium	ug/L	0.52	<0.21	<0.21	<0.21	<0.21	<0.42	<0.32	<0.32
Thallium	ug/L	0.31	<0.14	<0.14	<0.14	0.22	<0.29	0.17	<0.14
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Total Radium	pCi/L	0.41	1.62	0.456	0.729	1.09	1.51	0.494	1.67
pH at 25 Degrees C	Std. Units	7.9	7.6	7.4	7.5	7.9	7.9	7.7	7.5
Radium-226	pCi/L	0.32	0.958	-0.17	0.193	0.136	0.734	0.179	0.548
Radium-228	pCi/L	0.0904	0.661	0.456	0.536	0.951	0.774	0.315	0.296
Field Specific Conductance	umhos/cm	1206	1173	1230	1214	1198	1213	1147	1111
Oxygen, Dissolved	mg/L	4.8	1.6	0.1	0.2	7.4	5.5	3	0.5
Field Oxidation Potential	mV	5.2	89	-31	-24	173	51	-15	-13
Groundwater Elevation	feet	599.94	598.3	598	598.5	597.1	600.04	598.77	597.4
Temperature, Water (C)	deg C	7.2	10.1	10.5	10.8	8.8	8.9	9.5	11.6
Turbidity	NTU	10.88	3.13	2.42	46.07	21.84	168.6	16.11	6.51

Location ID: MW-301
Number of Sampling Dates: 21

Parameter Name	Units	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	6/26/2020	10/15/2020
Boron	ug/L	8820	7950	8230	7310	7220	7450	--	6550
Calcium	ug/L	87200	78900	88800	77500	87600	80800	--	114000
Chloride	mg/L	11.9	11.2	11.5	11.4	11.1	12.5	--	13.9
Fluoride	mg/L	<0.1	0.25	0.2	0.29	0.24	0.39	0.26	<0.48
Field pH	Std. Units	7.43	8.02	7.71	8.18	7.56	7.82	7.53	7.64
Sulfate	mg/L	341	332	318	322	312	298	--	293
Total Dissolved Solids	mg/L	772	752	722	724	694	718	--	678
Antimony	ug/L	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.5	7.8	7.7	7.9	7.8	7.9	--	7.6
Radium-226	pCi/L	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1096	1071	1086	1022	1052	977	983	996
Oxygen, Dissolved	mg/L	0	6.5	4.5	6.2	2.7	6.9	5.47	0.8
Field Oxidation Potential	mV	-18	44	53	55	146	17.1	49.1	140
Groundwater Elevation	feet	597.2	598.54	597.6	598.92	599.56	599.17	597.89	595.1
Temperature, Water (C)	deg C	10.7	7.8	11	9	12.2	8.5	16.8	11.2
Turbidity	NTU	11.58	12.19	13.32	32.91	79.44	37.12	62.57	130

Location ID: MW-301
Number of Sampling Dates: 21

Parameter Name	Units	4/14/2021	10/26/2021	4/13/2022	10/6/2022	4/25/2023			
Boron	ug/L	7200	6710	7240	6230	6770			
Calcium	ug/L	118000	102000	89300	86900	87900			
Chloride	mg/L	13.5	13.8	14	15.5	17.9			
Fluoride	mg/L	0.25	0.24	<0.095	0.21	0.21			
Field pH	Std. Units	7.96	7.01	7.38	7.56	7.63			
Sulfate	mg/L	195	203	212	213	168			
Total Dissolved Solids	mg/L	614	538	560	572	554			
Antimony	ug/L	--	--	--	--	--			
Arsenic	ug/L	--	--	--	--	--			
Barium	ug/L	--	--	--	--	--			
Beryllium	ug/L	--	--	--	--	--			
Cadmium	ug/L	--	--	--	--	--			
Chromium	ug/L	--	--	--	--	--			
Cobalt	ug/L	--	--	--	--	--			
Lead	ug/L	--	--	--	--	--			
Lithium	ug/L	--	--	--	--	--			
Molybdenum	ug/L	--	--	--	--	--			
Selenium	ug/L	--	--	--	--	--			
Thallium	ug/L	--	--	--	--	--			
Mercury	ug/L	--	--	--	--	--			
Total Radium	pCi/L	--	--	--	--	--			
pH at 25 Degrees C	Std. Units	7.7	7.1	7.5	7.6	7.7			
Radium-226	pCi/L	--	--	--	--	--			
Radium-228	pCi/L	--	--	--	--	--			
Field Specific Conductance	umhos/cm	815	811	777	804	765			
Oxygen, Dissolved	mg/L	8.2	5.4	2.82	0.39	3.14			
Field Oxidation Potential	mV	226	196	417.1	-41.7	416.4			
Groundwater Elevation	feet	595.17	590.68	594.89	590.21	597.77			
Temperature, Water (C)	deg C	7.8	11.2	9	11.6	8.5			
Turbidity	NTU	124	88.4	25.6	20.7	96.1			

Single Location
Name: WPL - Edgewater
Closed

Location ID: MW-302
Number of Sampling Dates: 20

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/2/2017
Boron	ug/L	1950	2010	2000	2150	2000	1970	1970	1890
Calcium	ug/L	122000	116000	75900	72100	87400	114000	72200	62600
Chloride	mg/L	18.9	27.2	18	19.5	18.6	18.9	20	19.3
Fluoride	mg/L	0.83	1.3	0.8	0.8	0.89	0.76	0.9	0.78
Field pH	Std. Units	8.01	7.73	6.55	7.89	7.98	7.99	7.84	7.76
Sulfate	mg/L	75.1	89.6	80.7	77.2	71.1	85.8	88.5	80.2
Total Dissolved Solids	mg/L	352	364	396	348	328	358	350	360
Antimony	ug/L	0.3	0.085	<0.073	<0.073	0.86	<0.36	0.16	<0.15
Arsenic	ug/L	10.3	9.7	10.2	8.4	10.9	9.6	8.7	9
Barium	ug/L	152	109	66.7	57.2	90.1	104	58.4	50.9
Beryllium	ug/L	0.59	0.35	<0.13	<0.13	0.78	<0.63	<0.18	<0.18
Cadmium	ug/L	0.24	<0.089	<0.089	<0.089	0.49	<0.44	<0.081	<0.081
Chromium	ug/L	18.7	11.1	3.5	2.5	7.1	10	6.6	1.1
Cobalt	ug/L	6.2	3.6	1.1	0.84	2.6	3.2	1.5	0.53
Lead	ug/L	5.5	3.3	0.84	0.71	2.3	5.2	0.7	0.44
Lithium	ug/L	58.1	62.3	55.4	51.8	54.8	58.7	52.3	52.2
Molybdenum	ug/L	610	640	652	685	674	654	631	649
Selenium	ug/L	1.3	0.76	<0.21	0.22	<1	<1	<0.32	<0.32
Thallium	ug/L	0.35	<0.14	<0.14	<0.14	1.6	<0.71	<0.14	<0.14
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Total Radium	pCi/L	1.47	0.505	0.0999	0.771	1.9	1.18	1.66	1.08
pH at 25 Degrees C	Std. Units	7.3	7.8	7.7	7.8	7.7	7.9	7.5	7.7
Radium-226	pCi/L	0.843	-0.408	-0.153	0.331	0.37	0.371	0.706	0.474
Radium-228	pCi/L	0.623	0.505	0.0999	0.44	1.53	0.813	0.95	0.604
Field Specific Conductance	umhos/cm	531	564	539	525	519	552	465	532
Oxygen, Dissolved	mg/L	1	0.2	0.1	1	0.1	0	0.5	0
Field Oxidation Potential	mV	-41	-123	-123	-111	-87	-517	-40	-121
Groundwater Elevation	feet	596.39	595.68	595.53	595.46	596.3	593.57	595.86	595.22
Temperature, Water (C)	deg C	9	13.1	13.2	11.2	9.3	9.6	12.2	12.6
Turbidity	NTU	885.4	369.4	108.3	62.99	161.1	367.5	94.92	39.69

Location ID: MW-302
Number of Sampling Dates: 20

Parameter Name	Units	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021
Boron	ug/L	1760	1800	1570	1670	1730	1570	1410	1550
Calcium	ug/L	68100	68000	64700	64800	67500	66800	124000	81200
Chloride	mg/L	18.9	18.5	18.6	18.4	17.8	19.2	20.9	20.6
Fluoride	mg/L	0.84	0.78	0.81	0.87	0.85	0.97	1	0.88
Field pH	Std. Units	7.6	7.78	7.99	7.98	7.86	7.56	7.9	8.19
Sulfate	mg/L	72.2	72.7	59.2	71.7	55.7	65.3	73.1	70.5
Total Dissolved Solids	mg/L	316	314	306	324	290	316	182	342
Antimony	ug/L	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	7.7	7.8	7.6	7.8	7.6	7.8	7.7	7.8
Radium-226	pCi/L	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	505	517	504	519	487	476	523	517
Oxygen, Dissolved	mg/L	0	0.6	0.8	1.6	1.3	0.4	0.3	1.8
Field Oxidation Potential	mV	-118	-123	-96	-95	124	-107.6	-83	41
Groundwater Elevation	feet	595.25	595.71	595.28	595.68	595.58	595.33	598.56	600.56
Temperature, Water (C)	deg C	11.1	10.3	11.6	11.9	13.5	11.3	11.2	7.5
Turbidity	NTU	42.45	24.89	55.15	59.51	32.69	69.22	161.8	252

Location ID: MW-302
Number of Sampling Dates: 20

Parameter Name	Units	10/26/2021	4/13/2022	10/6/2022	4/26/2023				
Boron	ug/L	1580	1460	1610	1450				
Calcium	ug/L	78200	61500	64000	46900				
Chloride	mg/L	20.7	21.2	21.2	16.5				
Fluoride	mg/L	0.88	0.91	0.87	0.75				
Field pH	Std. Units	7.6	7.7	7.89	7.85				
Sulfate	mg/L	71.2	68.5	70.5	75.4				
Total Dissolved Solids	mg/L	290	318	306	344				
Antimony	ug/L	--	--	--	--				
Arsenic	ug/L	--	--	--	--				
Barium	ug/L	--	--	--	--				
Beryllium	ug/L	--	--	--	--				
Cadmium	ug/L	--	--	--	--				
Chromium	ug/L	--	--	--	--				
Cobalt	ug/L	--	--	--	--				
Lead	ug/L	--	--	--	--				
Lithium	ug/L	--	--	--	--				
Molybdenum	ug/L	--	--	--	--				
Selenium	ug/L	--	--	--	--				
Thallium	ug/L	--	--	--	--				
Mercury	ug/L	--	--	--	--				
Total Radium	pCi/L	--	--	--	--				
pH at 25 Degrees C	Std. Units	7.8	7.7	7.8	8				
Radium-226	pCi/L	--	--	--	--				
Radium-228	pCi/L	--	--	--	--				
Field Specific Conductance	umhos/cm	496	488	499	501				
Oxygen, Dissolved	mg/L	0.1	1.39	0.61	1.86				
Field Oxidation Potential	mV	134	337.4	105.4	169.1				
Groundwater Elevation	feet	599.82	600.5	599.41	593.63				
Temperature, Water (C)	deg C	11.1	8.7	12.1	8.7				
Turbidity	NTU	69.8	26.2	21.9	3.1				

Single Location
Name: WPL - Edgewater
Closed

Location ID: MW-303
Number of Sampling Dates: 20

Parameter Name	Units	4/8/2016	6/20/2016	8/9/2016	10/20/2016	1/24/2017	4/6/2017	6/6/2017	8/2/2017
Boron	ug/L	4210	3360	3860	3740	4210	4170	4570	3780
Calcium	ug/L	176000	138000	145000	147000	147000	135000	154000	139000
Chloride	mg/L	21.8	31.5	22.8	26	26.2	22.7	25.4	23.2
Fluoride	mg/L	<0.2	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
Field pH	Std. Units	7.04	6.79	6.09	6.94	6.94	6.88	7	6.94
Sulfate	mg/L	3	11.4	2.4	5.6	<5	<5	<5	<5
Total Dissolved Solids	mg/L	660	716	732	744	738	700	714	714
Antimony	ug/L	0.14	<0.073	<0.073	<0.073	<0.073	<0.073	0.32	0.25
Arsenic	ug/L	12.8	9.7	10.7	18.1	25.3	21.8	25.2	21.9
Barium	ug/L	229	189	195	180	186	142	143	144
Beryllium	ug/L	0.3	<0.13	<0.13	<0.13	<0.13	<0.13	0.33	0.21
Cadmium	ug/L	<0.089	<0.089	<0.089	<0.089	<0.089	<0.089	0.17	0.14
Chromium	ug/L	14.1	1.5	2	1.8	1.4	1.5	2.1	1.7
Cobalt	ug/L	8.7	5.3	5	4.4	4.3	3	3.4	3.2
Lead	ug/L	4.7	0.28	0.35	0.21	0.19	0.16	0.56	0.66
Lithium	ug/L	17.6	9.1	10.4	8.9	8.3	8.3	9.3	10.7
Molybdenum	ug/L	25.1	11.6	12.7	9	7.7	5.1	4.5	5.9
Selenium	ug/L	1.2	0.48	0.31	0.55	0.71	0.38	0.5	0.6
Thallium	ug/L	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	0.36	0.26
Mercury	ug/L	<0.18	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13
Total Radium	pCi/L	1.44	1.93	1.22	1.48	1.16	1.31	1.2	1.81
pH at 25 Degrees C	Std. Units	7.2	7	6.9	7.2	7	6.8	6.9	7
Radium-226	pCi/L	0.239	1.03	0.651	0.521	0.386	0.123	0.276	0.772
Radium-228	pCi/L	1.2	0.898	0.567	0.962	0.772	1.19	0.926	1.04
Field Specific Conductance	umhos/cm	1273	1196	1220	1313	1335	1320	1112	1218
Oxygen, Dissolved	mg/L	0.49	0.9	0.1	0	0	0	0.8	0
Field Oxidation Potential	mV	-48	-71	-81	-102	-89	-20	-58	-116
Groundwater Elevation	feet	589.24	587.22	587.72	588.37	588.84	589.04	588.44	587.36
Temperature, Water (C)	deg C	9.1	11.6	11.9	10.7	10.5	10	10.2	10.4
Turbidity	NTU	409.5	18.26	48.39	16.45	12.58	9.61	186.4	28.41

Location ID: MW-303
Number of Sampling Dates: 20

Parameter Name	Units	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020	4/14/2021
Boron	ug/L	3480	3040	2360	2930	2830	3380	3310	4600
Calcium	ug/L	173000	146000	139000	135000	136000	144000	132000	176000
Chloride	mg/L	20.4	19.7	4.3	20	19.1	23.5	20.9	22.5
Fluoride	mg/L	<0.5	<0.5	<0.1	<0.5	<0.5	<0.48	<0.48	<0.095
Field pH	Std. Units	7.14	6.86	6.93	7.15	6.9	6.7	7.11	7.27
Sulfate	mg/L	<5	<5	<1	<5	<5	<2.2	<2.2	0.54
Total Dissolved Solids	mg/L	566	630	620	668	584	692	620	710
Antimony	ug/L	--	--	--	--	--	--	--	--
Arsenic	ug/L	--	--	--	--	--	--	--	--
Barium	ug/L	--	--	--	--	--	--	--	--
Beryllium	ug/L	--	--	--	--	--	--	--	--
Cadmium	ug/L	--	--	--	--	--	--	--	--
Chromium	ug/L	--	--	--	--	--	--	--	--
Cobalt	ug/L	--	--	--	--	--	--	--	--
Lead	ug/L	--	--	--	--	--	--	--	--
Lithium	ug/L	--	--	--	--	--	--	--	--
Molybdenum	ug/L	--	--	--	--	--	--	--	--
Selenium	ug/L	--	--	--	--	--	--	--	--
Thallium	ug/L	--	--	--	--	--	--	--	--
Mercury	ug/L	--	--	--	--	--	--	--	--
Total Radium	pCi/L	--	--	--	--	--	--	--	--
pH at 25 Degrees C	Std. Units	6.8	7	6.8	6.9	7	6.8	7	7.1
Radium-226	pCi/L	--	--	--	--	--	--	--	--
Radium-228	pCi/L	--	--	--	--	--	--	--	--
Field Specific Conductance	umhos/cm	1095	1131	1105	1196	1127	1241	1123	1222
Oxygen, Dissolved	mg/L	0	0.3	0.2	0.3	0.2	0.2	0.2	2.3
Field Oxidation Potential	mV	-108	-97	-93	-85	122	-102.9	-32	-41
Groundwater Elevation	feet	587.97	588.77	588.17	588.88	588.77	588.66	593.19	595.01
Temperature, Water (C)	deg C	11	9.8	10.7	10.3	11.8	10	10.9	7.7
Turbidity	NTU	563	233.5	107.1	61.84	94.01	87.6	70.42	408

Location ID: MW-303
Number of Sampling Dates: 20

Parameter Name	Units	10/26/2021	4/13/2022	10/6/2022	4/25/2023				
Boron	ug/L	3650	4360	3650	4870				
Calcium	ug/L	148000	139000	135000	128000				
Chloride	mg/L	21.6	23.4	22	22.3				
Fluoride	mg/L	<0.48	<0.48	<0.095	<0.095				
Field pH	Std. Units	6.92	6.78	6.92	6.87				
Sulfate	mg/L	<2.2	<2.2	<0.44	0.5				
Total Dissolved Solids	mg/L	640	722	658	740				
Antimony	ug/L	--	--	--	--				
Arsenic	ug/L	--	--	--	--				
Barium	ug/L	--	--	--	--				
Beryllium	ug/L	--	--	--	--				
Cadmium	ug/L	--	--	--	--				
Chromium	ug/L	--	--	--	--				
Cobalt	ug/L	--	--	--	--				
Lead	ug/L	--	--	--	--				
Lithium	ug/L	--	--	--	--				
Molybdenum	ug/L	--	--	--	--				
Selenium	ug/L	--	--	--	--				
Thallium	ug/L	--	--	--	--				
Mercury	ug/L	--	--	--	--				
Total Radium	pCi/L	--	--	--	--				
pH at 25 Degrees C	Std. Units	7	6.8	6.8	7.1				
Radium-226	pCi/L	--	--	--	--				
Radium-228	pCi/L	--	--	--	--				
Field Specific Conductance	umhos/cm	1171	1224	1184	1230				
Oxygen, Dissolved	mg/L	1.6	1.98	1.31	5.27				
Field Oxidation Potential	mV	170	330.2	175.4	370.4				
Groundwater Elevation	feet	594.07	595.2	593.63	587.99				
Temperature, Water (C)	deg C	12.3	8.6	11.8	8				
Turbidity	NTU	88.4	75.1	165	44.1				

Appendix E

Alternative Source Demonstrations (ASDs)

E1 October 2022 ASD

Alternative Source Demonstration
October 2022 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25223068.00 | May 8, 2023

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

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PE CERTIFICATION

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 Edgewater Generating Station Ash Ponds. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.

5/8/2023

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2024.

Pages or sheets covered by this seal:
Alternative Source Demonstration – October 2022 Detection Monitoring, Edgewater Generating Station, Sheboygan Wisconsin
(Entire Document)

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1.0 INTRODUCTION

This Alternative Source Demonstration (ASD) was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" published by the U.S. Environmental Protection Agency (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 the established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the October 2022 detection monitoring event at the Edgewater Generating Station (EDG). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018b). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrate that SSIs reported for boron, fluoride, and sulfate concentrations in the downgradient monitoring wells (MW-301, MW-302, and MW-303) were likely due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107.

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

1.2 SITE INFORMATION AND MAP

EDG is located at 3739 Lakeshore Drive in Sheboygan, Sheboygan County, Wisconsin (**Figure 1**). EDG is an active coal-burning generating station. The EDG property includes a closed landfill and a series of CCR settling ponds, located on the opposite side of Lakeshore Drive from the plant itself (**Figure 1**). The EDG landfill is closed and no longer receives CCR. The groundwater monitoring system at EDG is a multi-unit system monitoring four former existing CCR Units, which were contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing CCR surface impoundment)

Closure of the four CCR surface impoundments was initiated in 2020, the cover was in place in June 2021, and the closure was certified on August 9, 2021. The existing monitoring system is being used to monitor the closure area. A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided on **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the former ponds location. The landfill contains primarily fly ash with some slag and was closed in 1987. Because this CCR landfill did not accept CCR after October 19, 2015, the landfill is not subject to the requirements of 40 CFR 257.50-107. The closed landfill is unlined and is known to be impacting groundwater at the site (SCS, 2016). Previous investigations done at the site (BT^2, Inc., 1993; RMT, 1997) concluded that the groundwater impacts downgradient of the landfill and ponds were attributable to groundwater interaction with the landfill, rather than leakage from the ponds.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, fluoride, and sulfate at one or more wells based on the October 2022 detection monitoring event. A summary of the October 2022 constituent concentrations and the established benchmark concentrations are provided in **Table 1**. The constituent concentrations with SSIs above the background concentration are highlighted in the table.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

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

The boron, fluoride, and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the October 2022 detection monitoring event was included in the 2022 annual groundwater monitoring and corrective action report completed in January 2023. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells
- Groundwater flow direction

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

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at, and near, the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water source; however, several older sand wells in the area have been replaced with bedrock water supply wells.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity.

The regional groundwater flow in the unconsolidated sand and gravel aquifer in the vicinity of the site is to the east and slightly southeast.

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells, as shown on **Figure 2**. The upgradient monitoring well is 2R-0W. The downgradient monitoring wells include MW-301, MW-302, and MW-303. The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Sixteen groundwater monitoring wells currently exist at the EDG site as part of the monitoring system developed for the state monitoring program for the closed landfill. The well locations are shown on **Figure 2**. These monitoring wells are used to monitor groundwater conditions at the site under the WDNR state monitoring program.

Monitoring wells for the state monitoring program are installed in the unconsolidated material at the site. This shallow monitoring system includes water table wells and piezometers. Well depths range from approximately 9 to 43 feet, measured from the top of the well casing.

2.4 GROUNDWATER FLOW DIRECTION

Shallow groundwater in the area of the EDG site generally flows to the south-southeast, toward Fish Creek, which discharges into Lake Michigan. There is some localized groundwater mounding associated with the EDG ponds. The water table map shown on **Figure 3** represents the site conditions of the unconsolidated deposits during the October 2022 detection monitoring event. The water table map shows a generally southward flow direction. The groundwater elevations at the CCR and state monitoring wells during the October 2022 detection monitoring event are in **Tables 3A** and **3B**.

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 the exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. **Section 4.0** of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

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 another field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSI concentrations were due to a sampling error.

Because boron, fluoride, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory report for the October 2022 detection monitoring was reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs for boron, fluoride, or sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

Based on the review of the laboratory reports, SCS did not identify any indication that the SSI concentrations were due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the 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). Time series plots for the parameters with SSIs are provided in **Appendix A**. No indications of sampling or laboratory errors were noted based on the time series review. The October 2022 boron, fluoride, and sulfate results for 2R-OW, MW-301, MW-302, and MW-303 are consistent with the historical data.

3.3 STATISTICAL EVALUATION REVIEW

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

- Input analytical data vs. laboratory analytical reports

- Review statistical method and outlier concentration lists for each monitoring well/CCR unit

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

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

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

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, fluoride, and sulfate SSIs at MW-301, MW-302, and MW-303; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is most likely the cause of the observed SSIs for boron, fluoride, and sulfate.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the October 2022 detection monitoring results to the upper prediction limits (UPLs) calculated based on the sampling of the background well (2R-OW). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron and sulfate SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for fluoride at MW-302. Elevated natural fluoride concentrations significantly higher than those reported for the downgradient wells (above 2 milligrams per liter [mg/L]) have been observed in a region in eastern Wisconsin extending along the Lake Michigan shoreline from Kewaunee County in the north to the Illinois border in the south, as described in Luczaj, J., and Masarik, K, 2015, *Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA*. The authors note that most of the wells with elevated fluoride appear to be drawing from the Pleistocene glacial sediments and Silurian dolomite units. Skinner and Borman (1973) and Kammerer (1995) also identify the Lake Michigan shoreline area of eastern Wisconsin as having somewhat elevated fluoride concentrations in groundwater.

The fluoride concentrations reported for MW-302 for October 2017 through April 2020 and April 2021 through October 2022 were just above the laboratory's limit of quantitation (LOQ), ranging from 0.78 mg/L in April 2018 to 0.88 mg/L in October 2021. These results are within the range of fluoride results at MW-302 during background monitoring for the CCR rule prior to October 2017 (**Table 2**). The result at MW-302 is within the range of reported regional natural

concentrations, indicating that the fluoride concentration observed in this well is potentially due to natural variability in the glacial sediments and shallow groundwater. As discussed below, there is also a potential that fluoride in MW-302 is associated with impacts from the closed CCR landfill.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, fluoride, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on the groundwater flow directions and previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for wells MW-301, MW-302, and MW-303.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron and sulfate in compliance wells MW-301, MW-302, and MW-303, relative to the background well, are due to an alternative source include:

1. A previous study of the CCR ponds and the closed CCR landfill determined that the landfill was the primary source of groundwater impacts in the area, based on multiple lines of evidence.

2. Past and current monitoring performed under the state monitoring program shows that boron, fluoride, and sulfate are present in the CCR landfill leachate.

3. Past and current monitoring performed under the state monitoring program shows that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill.

Lines of evidence regarding natural variability as an additional alternative source of the fluoride SSIs are discussed above in **Section 4.1.1**.

Each of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018b). The lines of evidence are discussed briefly below, focusing on any updated information collected since the previous ASDs.

4.2.1 Previous CCR Pond and Landfill Study

A previous investigation titled *Field Investigation Report: Edgewater Closed Ash Disposal Facility*, completed by BT^2 in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT^2, 1993). The purpose of the 1993 investigation was to investigate the likely impact on groundwater quality of lining or abandoning the CCR impoundments (referred to in the report as the Wisconsin Pollutant Discharge Elimination System [WPDES] lagoons). The results from the investigation indicated that the CCR impoundments were not the primary source of downgradient groundwater impacts, and that closure or lining was not warranted at that time. The WDNR concurred with that finding in a letter dated April 20, 1994.

The primary lines of evidence from the 1993 report that supported this finding, and support the ASD for boron, fluoride, and sulfate, included:

- Water samples collected from each of the ponds met the Wisconsin groundwater enforcement standards established under NR 140, Wisconsin Administrative Code.

- Soil borings installed in the material below the larger ash pond, where the slag pond and the WDPES lagoons (North Pond A and South Pond A) were constructed, indicated that

material below the ponds was almost entirely slag material. Water leaking out of the lagoons and moving downward would encounter primarily slag, which is relatively inert, and not fly ash.

- Results for water leach testing of site-wide composite samples of fly ash and slag confirmed that the fly ash had a higher potential than slag to impact groundwater. Water leach test results for the fly ash composite sample were higher for boron, sulfate, and fluoride in comparison to the slag composite sample.

- Ash disposal in the closed landfill was primarily fly ash. For seven borings in the landfill, the percent fly ash ranged from 60 to 86 percent.

- Water leach testing for individual boring samples of fly ash and/or slag also confirmed that fly ash leachate had significantly higher concentrations of boron and sulfate than slag leachate. For example, boron leach test results for seven samples from borings within the landfill, consisting mainly of fly ash, ranged from 624 to 3,370 micrograms per liter (µg/L), with most results over 2,000 µg/L. Boron leach test results for nine samples from borings around and between the ponds, consisting mainly of slag, ranged from less than 16 to 206 µg/L.

- Water sampling within the landfill and pond area, in CCR above the native soil, documented that groundwater/leachate within the landfill had significantly higher concentrations of boron than the groundwater/leachate within the slag berms immediately adjacent to and between the Slag Pond, North/South Pond A, and Pond B.

- Groundwater monitoring results indicated that the highest concentrations of boron and sulfate were in monitoring wells downgradient from the landfill, including 18-OW and 29-OW. Elevated boron and sulfate were also reported for samples from wells 4-OW and 5-OW, located near the southwest and northwest corners of the landfill. Monitoring wells 6-OW and 7-OW, located east and southeast of the ponds, had much lower concentrations of boron and sulfate.

In the April 1994 approval letter, the WDNR approved the 1993 investigation of the WPDES lagoons/CCR impoundments and concurred with the findings of the report. The WDNR requested additional monitoring from the four new monitoring wells installed within the CCR (36-OW, 37-OW, 38R-OW, and 39R-OW) and requested the addition of fluoride and arsenic to the monitoring program for these groundwater/leachate head wells.

The results of the additional monitoring were reported to the WDNR in a Groundwater Assessment Report dated September 30, 1997. The WDNR responded to the 1997 report in a letter dated April 16, 1998, which stated, “We agree with the report’s finding that the WPDES ponds [Slag Pond, North Pond A, and South Pond A] do not appear to be significantly contributing to the contaminant plume downgradient of the facility. No further remedial action concerning the influence of the ponds on the landfill is warranted at this time.” The WDNR also noted that the leachable constituents migrating from the saturated portion of the closed landfill have stabilized or also decreased since the landfill’s closure and capping.

4.2.2 CCR Constituents in Landfill Leachate

Past and current monitoring performed under the state monitoring program shows that boron and sulfate are present in the CCR landfill leachate. Recent groundwater and leachate monitoring results

for boron and sulfate in samples from the state monitoring program wells are summarized in **Table 4** (April 2016 through October 2022). The leachate head wells monitoring conditions within the CCR landfill are 37-OW, 38R-OW, and 39R-OW, listed near the end of the table. Beginning in October 2020, one or more of these wells have not been sampled because they were dry; however, historical results can be used to characterize the leachate. Water levels within the landfill have decreased in response to the pond closures.

Boron: Boron concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Sulfate: Sulfate concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Fluoride: Fluoride is not part of the routine state monitoring program for the closed CCR landfill, but was sampled from the leachate wells (37-OW, 38R-OW, and 39R-OW) and the pond berm well (36-OW) from 1994 to 1997, as requested by the WDNR. The fluoride concentrations ranged from 0.25 to 0.97 mg/L (**Table 5**). The fluoride concentration for the sample collected at MW-302 (0.87 mg/L) was less than the highest observed concentration at the leachate wells.

Based on these results, fly ash disposal in the closed CCR landfill is a likely historical source of elevated boron and sulfate in groundwater, and is a potential source of fluoride.

4.2.3 State Program Groundwater Monitoring Results

Current monitoring performed under the state monitoring program continues to show that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill. State program monitoring results for the CCR Rule detection monitoring parameters that overlap with the state program are summarized in **Table 4**, and well locations are on **Figure 2**.

Consistent with the conditions observed at the time of the 1993 report, the recent groundwater monitoring results indicate that the highest concentrations of boron are in monitoring wells downgradient from the landfill, including 40-OW (replaced former 18-OW) and 29-OW. Sulfate concentrations at 29-OW have decreased since 1993, but remain high at downgradient well 40-OW. Elevated boron and sulfate also continue to be reported for samples from wells 4R-OW (replacement well for 4-OW) and 5-OW, located near the southwest and northwest corners of the landfill. Concentrations of boron and sulfate in the CCR program monitoring wells are lower than in the downgradient state program wells, consistent with the closed CCR landfill as the primary source.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, and sulfate concentrations in downgradient monitoring wells MW-301, MW-302, and/or MW-303 demonstrate that the SSIs are likely primarily due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program. Natural variation may also contribute to the SSI reported for fluoride in downgradient monitoring well MW-302.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

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

7.0 REFERENCES

BT2, Inc., 1993, Field Investigation Report, Edgewater Closed Ash Disposal Facility, Wisconsin Power & Light Company, WDNR License #2524, June 1993.

Krammerer, P.A. Jr., 1995, Ground-Water Flow and Quality in Wisconsin's Shallow Aquifer System, U.S. Geological Survey, Water-Resources Investigations Report 90-4171.

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Skinner, Earl L., and Borman, Ronald G., 1973, Water Resources of Wisconsin-Lake Michigan Basin, Department of the Interior United States Geological Survey Hydrogeologic Investigation Atlas HA-432.

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Tables

Table 1. Groundwater Analytical Results Summary
Edgewater Generating Station / SCS Engineers Project #25223068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		10/6/2022	10/6/2022	10/6/2022	10/6/2022
Appendix III					
Boron, µg/L	86	49.0	6,230	1,610	3,650
Calcium, µg/L	200,000	152,000	86,900	64,000	135,000
Chloride, mg/L	400	414	15.5	21.2	22.0
Fluoride, mg/L	0.2	<0.095	0.21 J	0.87	<0.095
Field pH, Std. Units	8.57	7.08	7.56	7.89	6.92
Sulfate, mg/L	36	28.0	213	70.5	<0.44
Total Dissolved Solids, mg/L	1,190	1,110	572	306	658

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

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
µg/L = micrograms per liter

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

Notes:
1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on a 1-of-2 retesting approach. The interwell UPLs were updated in January 2021 using data from April 2016 through October 2020.

Created by: NDK Date: 1/7/2021
Last revision by: ACW Date: 11/11/2022
Checked by: MDB Date: 11/11/2022
Scientist/PM QA/QC: MDB Date: 11/22/2022

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25223068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Background	2R-OW	4/8/2016	100	<0.20	19.5
		6/20/2016	22.4	<0.20	28.0
		8/9/2016	32.6	<0.20	25.4
		10/20/2016	43.1	<0.10	21.6
		1/24/2017	31.2	<0.10	23.9
		4/6/2017	70.6	<0.10	17.6
		6/6/2017	45.2	<0.10	17.8
		8/1/2017	35.7	<0.10	28.8
		10/23/2017	55.9	<0.10	29.3
		4/2/2018	19.7	0.12 J	17.2
		10/1/2018	34.7	<0.10	37.2
		4/8/2019	35.8	<0.10	10.6
		10/7/2019	58.8	<0.10	13.2
		4/8/2020	52.3	<0.095	11.6
		10/15/2020	29.9	<0.096 J	20.3
		4/14/2021	45.7	<0.095	15.3
		10/27/2021	47.2	<4.8 D3	35.7 J, D3
		4/13/2022	27.9 1q	<0.95 D3	18.5 J, D3
		10/6/2022	49.0	<0.095	28.0
Compliance	MW-301	4/11/2016	8,550	0.33 J	372
		6/20/2016	8,190	0.36 J	343
		8/9/2016	8,450	0.33 J	368
		10/20/2016	8,620	0.34	369
		1/23/2017	9,280	0.42	372
		4/6/2017	8,370	0.21 J	367
		6/6/2017	9,160	<0.10	362
		8/2/2017	8,610	0.32	340
		10/24/2017	8,820	<0.10	341
		4/2/2018	7,950	0.25 J	332
		10/1/2018	8,230	0.20 J	318
		4/8/2019	7,310	0.29 J	322
		10/7/2019	7,220	0.24 J	312
		4/8/2020	7,450	0.39 M0	298
		10/15/2020	6,550	<0.48 D3, M0	293
		4/14/2021	7,200	0.25 J	195
		10/26/2021	6,710	0.24 J, M0	203 M0
		4/13/2022	7,240	<0.095	212
		10/6/2022	6,230	0.21 J	213
	MW-302	4/8/2016	1,950	0.83	75.1
		6/20/2016	2,010	1.3 J	89.6
		8/9/2016	2,000	0.80	80.7
		10/20/2016	2,150	0.80	77.2
		1/24/2017	2,000	0.89 J	71.1
		4/6/2017	1,970	0.76	85.8
		6/6/2017	1,970	0.9	88.5
		8/2/2017	1,890	0.78	80.2
		10/24/2017	1,760	0.84	72.2
		4/2/2018	1,800	0.78	72.7
		10/1/2018	1,570	0.81	59.2
		4/8/2019	1,670	0.87	71.7
		10/7/2019	1,730	0.85	55.7
		4/8/2020	1,570	0.97	65.3
		10/15/2020	1,410	1.0 J, D3	73.1
		4/14/2021	1,550	0.88	70.5
		10/26/2021	1,580	0.88	71.2
		4/13/2022	1,460	0.91	68.5
		10/6/2022	1,610	0.87	70.5

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25223068.00

Well Group	Well	Collection Date	Boron (µg/L)	Fluoride (mg/L)	Sulfate (mg/L)
Compliance	MW-303	4/8/2016	4,210	<0.20	3.0 J
		6/20/2016	3,360	<1.0	11.4 J
		8/9/2016	3,860	<0.20	2.4 J
		10/20/2016	3,740	<0.50	5.6 J
		1/24/2017	4,210	<0.50	<5.0
		4/6/2017	4,170	<0.50	<5.0
		6/6/2017	4,570	<0.50	<5.0
		8/2/2017	3,780	<0.50	<5.0
		10/24/2017	3,480	<0.50	<5.0
		4/2/2018	3,040	<0.50	<5.0
		10/1/2018	2,360	<0.10	<1.0
		4/8/2019	2,930	<0.50	<5.0
		10/7/2019	2,830	<0.50	<5.0
		4/8/2020	3,380	<0.48	<2.2
		10/15/2020	3,310	<0.48 D3	<2.2 D3
		4/14/2021	4,600	<0.095	0.54 J
		10/26/2021	3,650	<0.48 D3	<2.2 D3
		4/13/2022	4,360	<0.48 D3	<2.2 D3
		10/6/2022	3,650	<0.095	<0.44

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = not analyzed
J = Estimated value below laboratory's limit of quantitation (LOQ)
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
1q = Analyte was measured in the associated method blank at -3.1 ug/L.

Notes:
1. Complete laboratory reports are included in the Annual Groundwater Monitoring and Corrective Action Reports, Edgewater Generating Station.

Created by:	NDK	Date:	3/2/2018
Last revision by:	RM	Date:	4/12/2023
Checked by:	NLB	Date:	4/12/2023

I:\25223068.00\Deliverables\2022 Oct ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 2. CCR Analytical

E2 April 2023 ASD

Alternative Source Demonstration
April 2023 Detection Monitoring

Edgewater Generating Station
Sheboygan, Wisconsin

Prepared for:

SCS ENGINEERS

25223068.00 | November 8, 2023

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

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PE CERTIFICATION

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

11/8/2023

(signature) (date)

Sherren Clark, PE

(printed or typed name)

License number E-29863

My license renewal date is July 31, 2024.

Pages or sheets covered by this seal:
Alternative Source Demonstration – April 2023 Detection Monitoring, Edgewater Generating Station, Sheboygan Wisconsin (Entire Document)

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1.0 INTRODUCTION

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

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 the established benchmark(s) at the site. This ASD was performed in response to results indicating a statistically significant increase (SSI) over background levels during detection monitoring under the CCR Rule.

This ASD report is evaluating the SSIs observed in the statistical evaluation of the April 2023 detection monitoring event at the Edgewater Generating Station (EDG). The first ASD was prepared for this facility evaluating the SSIs observed in the statistical evaluation of the October 2017 detection monitoring event (SCS Engineers [SCS], 2018b). The October 2017 ASD and subsequent semiannual updates have concluded that several lines of evidence demonstrate that SSIs reported for boron, fluoride, and sulfate concentrations in the downgradient monitoring wells (MW-301, MW-302, and MW-303) were likely due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107.

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

1.2 SITE INFORMATION AND MAP

EDG is located at 3739 Lakeshore Drive in Sheboygan, Sheboygan County, Wisconsin (**Figure 1**). EDG is an active coal-burning generating station. The EDG property includes a closed landfill and a series of CCR settling ponds, located on the opposite side of Lakeshore Drive from the plant itself (**Figure 1**). The EDG landfill is closed and no longer receives CCR. The groundwater monitoring system at EDG is a multi-unit system monitoring four former existing CCR Units, which were contiguous:

- EDG Slag Pond (existing CCR surface impoundment)
- EDG North A-Pond (existing CCR surface impoundment)
- EDG South A-Pond (existing CCR surface impoundment)
- EDG B-Pond (existing CCR surface impoundment)

Closure of the four CCR surface impoundments was initiated in 2020, the cover was in place in June 2021, and the closure was certified on August 9, 2021. The existing monitoring system is being used to monitor the closure area. A map showing the CCR Units and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided on **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the former ponds location. The landfill contains primarily fly ash with some slag and was closed in 1987. Because this CCR landfill did not accept CCR after October 19, 2015, the landfill is not subject to the requirements of 40 CFR 257.50-107. The closed landfill is unlined and is known to be impacting groundwater at the site (SCS, 2016). Previous investigations done at the site (BT^2, Inc., 1993; RMT, 1997) concluded that the groundwater impacts downgradient of the landfill and ponds were attributable to groundwater interaction with the landfill, rather than leakage from the ponds.

1.3 STATISTICALLY SIGNIFICANT INCREASES IDENTIFIED

SSIs were identified for boron, fluoride, and sulfate at one or more wells based on the April 2023 detection monitoring event. A summary of the April 2023 constituent concentrations and the established benchmark concentrations are provided in **Table 1**. The constituent concentrations with SSIs above the background concentration are highlighted in the table.

1.4 OVERVIEW OF ALTERNATIVE SOURCE DEMONSTRATION

This ASD report includes:

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

The boron, fluoride, and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the April 2023 detection monitoring event will be included in the 2023 annual groundwater monitoring and corrective action report to be completed in January 2024. Complete laboratory reports for the background monitoring events and previous detection monitoring events were included in the previous annual groundwater monitoring and corrective action reports.

2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system
- Other monitoring wells
- Groundwater flow direction

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

2.1 REGIONAL GEOLOGY AND HYDROGEOLOGY

For the purposes of groundwater monitoring, the unconsolidated sand and gravel aquifer is considered to be the uppermost aquifer, as defined under 40 CFR 257.53, at the EDG ponds. The sand and gravel aquifer is present in some parts of Sheboygan County (Skinner and Borman, 1973). Boring logs from monitoring wells at the EDG ponds and for nearby private wells indicate that the unconsolidated material at, and near, the site contains a significant amount of sand. Private well logs from the surrounding area indicate that the sand and gravel aquifer has been used as a water source; however, several older sand wells in the area have been replaced with bedrock water supply wells.

The dolomite aquifer underlies the unconsolidated material at the site. The total thickness of the dolomite aquifer at the site is unknown. The dolomite aquifer is underlain by the Maquoketa shale, which is a confining unit. The Maquoketa shale is underlain by the Cambrian-Ordovician sandstone aquifer. This sequence of sedimentary bedrock units is over 1,500 feet thick in the site vicinity.

The regional groundwater flow in the unconsolidated sand and gravel aquifer in the vicinity of the site is to the east and slightly southeast.

2.2 CCR MONITORING SYSTEM

The groundwater monitoring system established under the CCR Rule consists of one upgradient (background) monitoring well and three downgradient monitoring wells, as shown on **Figure 2**. The upgradient monitoring well is 2R-OW. The downgradient monitoring wells include MW-301, MW-302, and MW-303. The CCR compliance monitoring wells were installed in the unconsolidated sediments with screens in the uppermost soil layer producing appreciable water, which was a sandy silt unit. Well depths range from approximately 14.5 to 40 feet, measured from the top of the well casing.

2.3 OTHER MONITORING WELLS

Sixteen groundwater monitoring wells currently exist at the EDG site as part of the monitoring system developed for the state monitoring program for the closed landfill. The well locations are shown on **Figure 2**. These monitoring wells are used to monitor groundwater conditions at the site under the WDNR state monitoring program.

Monitoring wells for the state monitoring program are installed in the unconsolidated material at the site. This shallow monitoring system includes water table wells and piezometers. Well depths range from approximately 9 to 43 feet, measured from the top of the well casing.

2.4 GROUNDWATER FLOW DIRECTION

Shallow groundwater in the area of the EDG site generally flows to the south-southeast, toward Fish Creek, which discharges into Lake Michigan. There is some localized groundwater mounding associated with the EDG ponds. The water table map shown on **Figure 3** represents the site conditions of the unconsolidated deposits during the April 2023 detection monitoring event. The water table map shows a generally southward flow direction. The groundwater elevations at the CCR and state monitoring wells during the April 2023 detection monitoring event are in **Tables 3A** and **3B**.

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 the exceedance of the benchmark. Second, potential alternative sources, including natural variation and man-made sources other than the CCR Unit, were evaluated. This section of the report provides the findings of the methodology and analysis review. Section 4.0 of the report addresses the potential alternative sources.

3.1 SAMPLING AND FIELD ANALYSIS REVIEW

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 another field error. Field blank sample results were also reviewed for any indication of potential contamination from sampling equipment or containers. Based on the review of the field notes and results, SCS did not identify any indication that the SSI concentrations were due to a sampling error.

Because boron, fluoride, and sulfate are laboratory parameters, there is little potential for a field analysis error to contribute to an SSI.

3.2 LABORATORY ANALYSIS REVIEW

The laboratory report for the April 2023 detection monitoring was reviewed to evaluate whether any laboratory analysis error or issue may have caused or contributed to the observed SSIs for boron, fluoride, or sulfate. The laboratory report review included reviewing the laboratory quality control flags and narrative, verifying that correct methods were used and desired detection limits were achieved, and checking the field and laboratory blank sample results. Laboratory reports for the background monitoring events were reviewed for the October 2017 ASD. Laboratory reports for subsequent detection monitoring events were reviewed as part of the ASD preparation for each event.

Based on the review of the laboratory reports, SCS did not identify any indication that the SSI concentrations were due to a laboratory analysis error. There were no laboratory quality control flags or issues identified in the laboratory reports that affect the usability of the data for detection monitoring.

Time series plots of the 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). Time series plots for the parameters with SSIs are provided in Appendix A. No indications of sampling or laboratory errors were noted based on the time series review. The April 2023 boron, fluoride, and sulfate results for 2R-OW, MW-301, MW-302, and MW-303 are consistent with the historical data.

3.3 STATISTICAL EVALUATION REVIEW

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

- Input analytical data vs. laboratory analytical reports
- Review statistical method and outlier concentration lists for each monitoring well/CCR unit

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

3.4 SUMMARY OF METHODOLOGY AND ANALYSIS REVIEW FINDINGS

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

4.0 ALTERNATIVE SOURCES

This section of the report discusses the potential alternative sources for the boron, fluoride, and sulfate SSIs at MW-301, MW-302, and MW-303; identifies the most likely alternative source(s); and presents the lines of evidence indicating that an alternative source is most likely the cause of the observed SSIs for boron, fluoride, and sulfate.

4.1 POTENTIAL CAUSES OF SSI

4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the April 2023 detection monitoring results to the upper prediction limits (UPLs) calculated based on the sampling of the background well (2R-OW). If concentrations of a constituent that is naturally present in the aquifer vary spatially, then the potential exists that the downgradient concentrations may be higher than upgradient concentrations due to natural variation.

Although natural variation is present in the shallow aquifer, it does not appear likely that natural variation is the primary source causing the boron and sulfate SSIs. These parameters were detected at higher concentrations than would likely be present naturally.

Natural variation may have caused or contributed to the SSI for fluoride at MW-302. Elevated natural fluoride concentrations significantly higher than those reported for the downgradient wells (above 2 milligrams per liter [mg/L]) have been observed in a region in eastern Wisconsin extending along the Lake Michigan shoreline from Kewaunee County in the north to the Illinois border in the south, as described in Luczaj, J., and Masarik, K., 2015, *Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA*. The authors note that most of the wells with elevated fluoride appear to be drawing from the Pleistocene glacial sediments and Silurian dolomite units. Skinner and Borman (1973) and Kammerer (1995) also identify the Lake Michigan shoreline area of eastern Wisconsin as having somewhat elevated fluoride concentrations in groundwater.

The fluoride concentrations reported for MW-302 for October 2017 through April 2020 and April 2021 through October 2022 were just above the laboratory's limit of quantitation (LOQ), ranging from 0.75 mg/L in April 2023 to 0.88 mg/L in October 2021. These results are within the range of fluoride results at MW-302 during background monitoring for the CCR rule prior to October 2017 (**Table 2**). The result at MW-302 is within the range of reported regional natural concentrations, indicating that the fluoride concentration observed in this well is potentially due to natural variability in the glacial sediments and shallow groundwater. As discussed below, there is also a potential that fluoride in MW-302 is associated with impacts from the closed CCR landfill.

4.1.2 Man-Made Alternative Sources

Man-made alternative sources that could potentially contribute to the boron, fluoride, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on the groundwater flow directions and previous investigations at the site, the closed landfill appears to be the most likely cause of the SSIs for wells MW-301, MW-302, and MW-303.

4.2 LINES OF EVIDENCE

The lines of evidence indicating that the SSIs for boron, fluoride, and sulfate in compliance wells MW-301, MW-302, and MW-303, relative to the background well, are due to an alternative source include:

1. A previous study of the CCR ponds and the closed CCR landfill determined that the landfill was the primary source of groundwater impacts in the area, based on multiple lines of evidence.

2. Past and current monitoring performed under the state monitoring program shows that boron, fluoride, and sulfate are present in the CCR landfill leachate.

3. Past and current monitoring performed under the state monitoring program shows that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill.

Lines of evidence regarding natural variability as an additional alternative source of the fluoride SSIs are discussed above in **Section 4.1.1**.

Each of these lines of evidence and the supporting data were discussed in detail in the ASD for the October 2017 detection monitoring event (SCS, 2018b). The lines of evidence are discussed briefly below, focusing on any updated information collected since the previous ASDs.

4.2.1 Previous CCR Pond and Landfill Study

A previous investigation titled *Field Investigation Report: Edgewater Closed Ash Disposal Facility*, completed by BT^2 in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT^2, 1993). The purpose of the 1993 investigation was to investigate the likely impact on groundwater quality of lining or abandoning the CCR impoundments (referred to in the report as the Wisconsin Pollutant Discharge Elimination System [WPDES] lagoons). The results from the investigation indicated that the CCR impoundments were not the primary source of downgradient groundwater impacts, and that closure or lining was not warranted at that time. The WDNR concurred with that finding in a letter dated April 20, 1994.

The primary lines of evidence from the 1993 report that supported this finding, and support the ASD for boron, fluoride, and sulfate, included:

- Water samples collected from each of the ponds met the Wisconsin groundwater enforcement standards established under NR 140, Wisconsin Administrative Code.

- Soil borings installed in the material below the larger ash pond, where the slag pond and the WDPES lagoons (North Pond A and South Pond A) were constructed, indicated that material below the ponds was almost entirely slag material. Water leaking out of the lagoons and moving downward would encounter primarily slag, which is relatively inert, and not fly ash.

- Results for water leach testing of site-wide composite samples of fly ash and slag confirmed that the fly ash had a higher potential than slag to impact groundwater. Water leach test results for the fly ash composite sample were higher for boron, sulfate, and fluoride in comparison to the slag composite sample.

- Ash disposal in the closed landfill was primarily fly ash. For seven borings in the landfill, the percent fly ash ranged from 60 to 86 percent.

- Water leach testing for individual boring samples of fly ash and/or slag also confirmed that fly ash leachate had significantly higher concentrations of boron and sulfate than slag leachate. For example, boron leach test results for seven samples from borings within the landfill, consisting mainly of fly ash, ranged from 624 to 3,370 micrograms per liter (µg/L), with most results over 2,000 µg/L. Boron leach test results for nine samples from borings around and between the ponds, consisting mainly of slag, ranged from less than 16 to 206 µg/L.

- Water sampling within the landfill and pond area, in CCR above the native soil, documented that groundwater/leachate within the landfill had significantly higher concentrations of boron than the groundwater/leachate within the slag berms immediately adjacent to and between the Slag Pond, North/South Pond A, and Pond B.

- Groundwater monitoring results indicated that the highest concentrations of boron and sulfate were in monitoring wells downgradient from the landfill, including 18-OW and 29-OW. Elevated boron and sulfate were also reported for samples from wells 4-OW and 5-OW, located near the southwest and northwest corners of the landfill. Monitoring wells 6-OW and 7-OW, located east and southeast of the ponds, had much lower concentrations of boron and sulfate.

In the April 1994 approval letter, the WDNR approved the 1993 investigation of the WPDES lagoons/CCR impoundments and concurred with the findings of the report. The WDNR requested additional monitoring from the four new monitoring wells installed within the CCR (36-OW, 37-OW, 38R-OW, and 39R-OW) and requested the addition of fluoride and arsenic to the monitoring program for these groundwater/leachate head wells.

The results of the additional monitoring were reported to the WDNR in a Groundwater Assessment Report dated September 30, 1997. The WDNR responded to the 1997 report in a letter dated April 16, 1998, which stated, “We agree with the report’s finding that the WPDES ponds [Slag Pond, North Pond A, and South Pond A] do not appear to be significantly contributing to the contaminant plume downgradient of the facility. No further remedial action concerning the influence of the ponds on the landfill is warranted at this time.” The WDNR also noted that the leachable constituents migrating from the saturated portion of the closed landfill have stabilized or also decreased since the landfill’s closure and capping.

4.2.2 CCR Constituents in Landfill Leachate

Past and current monitoring performed under the state monitoring program shows that boron and sulfate are present in the CCR landfill leachate. Recent groundwater and leachate monitoring results for boron and sulfate in samples from the state monitoring program wells are summarized in **Table 4** (April 2016 through April 2023). The leachate head wells monitoring conditions within the CCR landfill are 37-OW, 38R-OW, and 39R-OW, listed near the end of the table. Beginning in October 2020, one or more of these wells have not been sampled because they were dry, or did not have

enough water in the well for sample collection; however, historical results can be used to characterize the leachate. Water levels within the landfill have decreased in response to the pond closures.

Boron: Boron concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Sulfate: Sulfate concentrations in samples from leachate head wells 37-OW, 38R-OW, and 39R-OW have generally exceeded those reported for the CCR monitoring wells.

Fluoride: Fluoride is not part of the routine state monitoring program for the closed CCR landfill, but was sampled from the leachate wells (37-OW, 38R-OW, and 39R-OW) and the pond berm well (36-OW) from 1994 to 1997, as requested by the WDNR. The fluoride concentrations ranged from 0.25 to 0.97 mg/L (**Table 5**). The fluoride concentration for the sample collected at MW-302 (0.75 mg/L) was less than the highest observed concentration at the leachate wells.

Based on these results, fly ash disposal in the closed CCR landfill is a likely historical source of elevated boron and sulfate in groundwater, and is a potential source of fluoride.

4.2.3 State Program Groundwater Monitoring Results

Current monitoring performed under the state monitoring program continues to show that the highest boron and sulfate concentrations are in the monitoring wells near and downgradient from the CCR landfill. State program monitoring results for the CCR Rule detection monitoring parameters that overlap with the state program are summarized in **Table 4**, and well locations are on **Figure 2**.

Consistent with the conditions observed at the time of the 1993 report, the recent groundwater monitoring results indicate that the highest concentrations of boron are in monitoring wells downgradient from the landfill, including 40-OW (replaced former 18-OW) and 29-OW. Sulfate concentrations at 29-OW have decreased since 1993, but remain elevated at downgradient well 40-OW. Elevated boron and sulfate also continue to be reported for samples from wells 4R-OW (replacement well for 4-OW) and 5-OW, located near the southwest and northwest corners of the landfill. Concentrations of boron and sulfate in the CCR program monitoring wells are lower than in the downgradient state program wells, consistent with the closed CCR landfill as the primary source.

5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, and sulfate concentrations in downgradient monitoring wells MW-301, MW-302, and/or MW-303 demonstrate that the SSIs are likely primarily due to leachate from the closed landfill, which is not subject to the requirements of 40 CFR 257.50-107. The landfill is regulated by the WDNR under the solid waste program. Natural variation may also contribute to the SSI reported for fluoride in downgradient monitoring well MW-302.

6.0 SITE GROUNDWATER MONITORING RECOMMENDATIONS

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

7.0 REFERENCES

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Tables

Table 1. Groundwater Analytical Results Summary
Edgewater Generating Station / SCS Engineers Project #25223068.00

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	**MW-301**	**MW-302**	**MW-303**
		4/26/2023	4/25/2023	4/26/2023	4/25/2023
Groundwater Elevation, ft amsl	**UPL**	607.74	597.77	593.63	587.99
Appendix III					
Boron, µg/L	78.4	32.0	6,770	1,450	4,870
Calcium, µg/L	201,000	91,800 P6	87,900	46,900	128,000
Chloride, mg/L	456	53.4	17.9	16.5	22.3
Fluoride, mg/L	0.200	0.11 J	0.21 J	0.75	<0.095
Field pH, Std. Units	8.57	7.30	7.63	7.85	6.87
Sulfate, mg/L	36.7	7.5	168	75.4	0.5 J
Total Dissolved Solids, mg/L	1,220	512	554	344	740

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

Abbreviations:
UPL = Upper Prediction Limit
-- = Not Applicable
LOD = Limit of Detection
LOQ = Limit of Quantitation
mg/L = milligrams per liter
µg/L = micrograms per liter

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

Notes:
1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background well 2R-OW. Interwell UPLs based on a 1-of-2 retesting approach. The interwell UPLs were updated in July 2023 using data from April 2016 through April 2023.

Created by: NDK Date: 1/7/2021
Last revision by: SCC Date: 7/28/2023
Checked by: RM Date: 7/31/2023
Scientist/PM QA/QC: TK Date: 7/31/2023

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25223068.00

Well Group	Well	Collection Date	Boron (µg/L)	Field pH (Std. Units)	Fluoride (mg/L)	Sulfate (mg/L)
Background	2R-OW	4/8/2016	100	7.34	<0.20	19.5
		6/20/2016	22.4	7.02	<0.20	28.0
		8/9/2016	32.6	6.10	<0.20	25.4
		10/20/2016	43.1	6.98	<0.10	21.6
		1/24/2017	31.2	7.15	<0.10	23.9
		4/6/2017	70.6	7.01	<0.10	17.6
		6/6/2017	45.2	6.86	<0.10	17.8
		8/1/2017	35.7	7.00	<0.10	28.8
		10/23/2017	55.9	7.23	<0.10	29.3
		4/2/2018	19.7	7.29	0.12 J	17.2
		10/1/2018	34.7	7.03	<0.10	37.2
		4/8/2019	35.8	8.57	<0.10	10.6
		10/7/2019	58.8	6.88	<0.10	13.2
		4/8/2020	52.3	7.08	<0.095	11.6
		10/15/2020	29.9	7.20	<0.096 J	20.3
		4/14/2021	45.7	7.52	<0.095	15.3
		10/27/2021	47.2	7.01	<4.8 D3	35.7 J, D3
		4/13/2022	27.9 1q	7.20	<0.95 D3	18.5 J, D3
		10/6/2022	49.0	7.08	<0.095	28.0
		4/26/2023	32.0	7.30	0.11 J	7.5
Compliance	MW-301	4/11/2016	8,550	7.91	0.33 J	372
		6/20/2016	8,190	7.48	0.36 J	343
		8/9/2016	8,450	6.47	0.33 J	368
		10/20/2016	8,620	7.68	0.34	369
		1/23/2017	9,280	8.03	0.42	372
		4/6/2017	8,370	7.98	0.21 J	367
		6/6/2017	9,160	7.70	<0.10	362
		8/2/2017	8,610	7.58	0.32	340
		10/24/2017	8,820	7.43	<0.10	341
		4/2/2018	7,950	8.02	0.25 J	332
		10/1/2018	8,230	7.71	0.20 J	318
		4/8/2019	7,310	8.18	0.29 J	322
		10/7/2019	7,220	7.56	0.24 J	312
		4/8/2020	7,450	7.82	0.39 M0	298
		10/15/2020	6,550	7.64	<0.48 D3, M0	293
		4/14/2021	7,200	7.96	0.25 J	195
		10/26/2021	6,710	7.01	0.24 J, M0	203 M0
		4/13/2022	7,240	7.38	<0.095	212
		10/6/2022	6,230	7.56	0.21 J	213
		4/25/2023	6,770	7.63	0.21 J	168
	MW-302	4/8/2016	1,950	8.01	0.83	75.1
		6/20/2016	2,010	7.73	1.3 J	89.6
		8/9/2016	2,000	6.55	0.80	80.7
		10/20/2016	2,150	7.89	0.80	77.2
		1/24/2017	2,000	7.98	0.89 J	71.1
		4/6/2017	1,970	7.99	0.76	85.8
		6/6/2017	1,970	7.84	0.9	88.5
		8/2/2017	1,890	7.76	0.78	80.2
		10/24/2017	1,760	7.60	0.84	72.2
		4/2/2018	1,800	7.78	0.78	72.7
		10/1/2018	1,570	7.99	0.81	59.2
		4/8/2019	1,670	7.98	0.87	71.7
		10/7/2019	1,730	7.86	0.85	55.7
		4/8/2020	1,570	7.56	0.97	65.3
		10/15/2020	1,410	7.90	1.0 J, D3	73.1
		4/14/2021	1,550	8.19	0.88	70.5
		10/26/2021	1,580	7.60	0.88	71.2
		4/13/2022	1,460	7.70	0.91	68.5
		10/6/2022	1,610	7.89	0.87	70.5
		4/26/2023	1,450	7.85	0.75	75.4

Table 2. Historical Analytical Results for Parameters with SSIs
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25223068.00

Well Group	Well	Collection Date	Boron (µg/L)	Field pH (Std. Units)	Fluoride (mg/L)	Sulfate (mg/L)
Compliance	MW-303	4/8/2016	4,210	7.04	<0.20	3.0 J
		6/20/2016	3,360	6.79	<1.0	11.4 J
		8/9/2016	3,860	6.09	<0.20	2.4 J
		10/20/2016	3,740	6.94	<0.50	5.6 J
		1/24/2017	4,210	6.94	<0.50	<5.0
		4/6/2017	4,170	6.88	<0.50	<5.0
		6/6/2017	4,570	7.00	<0.50	<5.0
		8/2/2017	3,780	6.94	<0.50	<5.0
		10/24/2017	3,480	7.14	<0.50	<5.0
		4/2/2018	3,040	6.86	<0.50	<5.0
		10/1/2018	2,360	6.93	<0.10	<1.0
		4/8/2019	2,930	7.15	<0.50	<5.0
		10/7/2019	2,830	6.90	<0.50	<5.0
		4/8/2020	3,380	6.70	<0.48	<2.2
		10/15/2020	3,310	7.11	<0.48 D3	<2.2 D3
		4/14/2021	4,600	7.27	<0.095	0.54 J
		10/26/2021	3,650	6.92	<0.48 D3	<2.2 D3
		4/13/2022	4,360	6.78	<0.48 D3	<2.2 D3
		10/6/2022	3,650	6.92	<0.095	<0.44
		4/25/2023	4,870	6.87	<0.095	0.50 J

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)
-- = not analyzed
J = Estimated value below laboratory's limit of quantitation (LOQ)
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
1q = Analyte was measured in the associated method blank at -3.1 µg/L.

Notes:
1. Complete laboratory reports are included in the Annual Groundwater Monitoring and Corrective Action Reports, Edgewater Generating Station.

Created by:	NDK	Date:	3/2/2018
Last revision by:	RM	Date:	9/20/2023
Checked by:	NLB	Date:	9/20/2023

I:\25223068.00\Deliverables\2023 April ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 2. CCR Analytical

Table 3A. Groundwater Elevations - State Monitoring Wells
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25223068.00

	Ground Water Elevation in feet above mean sea level (amsl)																					
Well Number	**1-OW**	**2R-OW**	**3R-OW**	**4R-OW**	**5-OW**	**W-5A**	**6-AR**	**6R-OW**	**7A-OW**	**7-OW**	**18-OW**	**29-OW**	**29-A**	**30-OW**	**31-OW**	**32-OW**	**36-OW**	**37-OW**	**38R-OW**	**39R-OW**	**40-OW**	**SG-01**
Top of Casing Elevation (ft amsl)^	592.18	611.85	591.59	594.68	600.94	600.66	590.78	591.74	593.45	593.19	ABAND	588.72	588.43	591.13	589.22	589.21	ABAND	615.30	620.24	614.27	586.69	ABAND
Screen Length (ft)																						
Total Depth (ft from top of casing)	11.10	17.53	15.82	16.48	10.65	21.51	19.86	10.37	20.21	9.93	14.25	19.96	43.12	14.88	14.98	14.95	21.01	18.55	29.00	22.29	17.3	
Top of Well Screen Elevation (ft)	580.62	595.19	575.50	579.12	590.07	580.33	571.46	580.61	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	591.98	591.75		0.00
Measurement Date																						
October 24, 2012	588.11	607.82	582.64	585.24	595.63	596.69	587.42	587.40	592.00	589.78	583.49	585.33	586.60	586.40	582.58	583.63	599.77	599.42	599.38	598.05		597.60
April 18, 2012					595.89	597.13	587.33	587.35	592.35	589.79		585.32	588.39									
October 24, 2012					595.63	596.69	587.42	587.40	592.00	589.78		585.33	586.60									
April 8, 2013	588.50	609.92	588.37	586.35	596.66	597.65	588.40	587.34	592.79	589.95	583.97	585.78	588.07	588.57	584.35	584.50	600.79	600.24	600.16	598.30	--	597.9
October 22, 2013	584.88	601.15	580.90	584.46	594.23	595.64	582.64	584.83	591.23	587.24	NM [1]	584.70	586.76	582.19	580.40	580.76	599.13	598.22	598.42	596.56	--	598.0
April 22, 2014	588.05	609.22	587.99	586.11	595.18	597.10	587.00	587.37	589.27	589.51	NM [1]	585.38	588.22	587.53	583.75	583.75	NM [1]	599.67	599.38	598.56	--	597.8
October 28, 2014	586.14	607.27	586.30	585.08	595.33	596.51	587.68	586.99	591.92	589.29	NM [1]	585.00	587.84	585.48	582.88	582.68	600.07	599.81	599.26	598.37	--	595.85
April 7 - 9, 2015	587.90	608.47	587.44	585.52	595.66	596.76	586.99	587.50	591.95	588.50	ABAND	585.44	587.55	586.29	583.21	583.87	599.69	599.21	599.21	597.46	583.77	597.6
October 8, 2015	584.78	604.22	583.34	584.52	594.76	594.47	582.65	585.67	591.23	589.71	ABAND	584.69	587.27	584.26	581.60	582.52	600.29	599.47	599.70	598.09	583.01	--
April 4-5, 2016	588.40	610.02	587.72	586.69	596.70	597.81	584.52	585.68	592.41	587.93	ABAND	582.95	587.25	586.91	584.35	584.47	601.05	601.37	601.18	601.13	579.28	599
October 17, 2016 [2]	587.50	607.27	586.71	585.15	595.41	596.82	584.34	586.61	592.01	587.65	ABAND	581.25	586.10	586.23	583.02	583.83	600.87	600.70	600.74	599.49	579.42	
April 12-13, 2017	588.23	609.80	587.95	586.31	596.08	597.69	586.77	587.32	592.19	587.06	ABAND	583.74	585.43	585.36	583.68	584.52	602.01	602.11	602.08	601.29	584.02	
October 9, 2017	584.14	600.87	581.00	584.49	594.68	596.04	583.03	583.51	590.50	585.96	ABAND	583.01	584.88	582.76	580.93	581.18	600.18	598.48	599.65	598.07	583.05	
April 2, 2018	587.79	607.87	586.63	586.68	595.73	596.88	586.80	587.44	591.76	589.62	ABAND	585.51	587.11	585.68	582.95	582.85	600.71	600.00	600.04	597.99	583.64	
June 19, 2018	NM	605.70	585.49	585.20	595.41	NM	NM	NM	NM	587.20	ABAND	585.43	585.79	584.96	582.29	NM	NM (1)	600.44	600.68	599.61	583.07	NM
October 1, 2018	585.37	604.61	584.18	584.86	595.24	596.44	586.10	586.86	591.01	588.75	ABAND	585.04	584.94	584.79	582.11	582.81	600.30	600.12	600.27	599.79	583.17	
April 8, 2019	588.57	609.50	588.01	591.93	596.03	597.33	584.61	587.35	591.92	590.06	ABAND	585.76	586.75	587.83	584.18	584.85	600.21	599.60	599.74	598.49	583.75	
October 9-10, 2019	587.85	609.39	587.39	585.99	595.68	596.92	586.42	587.24	591.66	587.53	ABAND	585.14	585.10	587.15	583.63	584.48	599.92	600.25	600.01	599.82	583.08	
April 8-9, 2020	588.03	608.97	587.70	586.05	595.57	596.89	585.74	586.95	591.61	587.76	ABAND	584.98	587.35	587.29	583.70	584.59	599.40	599.52	599.48	599.38	583.01	
October 14-15, 2020	584.62	604.37	582.20	584.54	593.27	594.86	582.71	583.45	588.81	586.53	ABAND	583.95	586.83	583.83	582.60	582.82	ABAND	596.87	NM	594.72	583.26	NM
April 14, 2021	587.95	608.50	587.64	585.42	594.87	596.13	586.53	587.29	591.28	589.89	ABAND	585.16	587.64	587.06	583.46	584.25	ABAND	DRY	596.50	593.95	583.08	NM
October 27-28, 2021	584.53	603.62	580.74	584.47	593.06	594.70	579.90	584.60	590.45	587.39	ABAND	584.60	586.65	582.89	581.88	582.02	ABAND	DRY	595.49	592.34	582.74	ABAND
February 28, 2022	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	ABAND	NM	NM	NM	NM	NM	ABAND	DRY	595.25	NM	NM	ABAND
April 13, 2022	588.64	608.63	588.30	585.06	595.72	595.11	586.08	588.15	591.60	590.70	ABAND	584.69	584.82	588.02	584.10	585.09	ABAND	DRY	594.43	DRY	583.09	ABAND
October 6, 2022	584.39	601.93	580.62	583.52	593.16	593.41	582.43	584.86	590.02	587.38	ABAND	583.21	584.18	583.09	581.55	581.98	ABAND	DRY	594.62	593.36	582.60	ABAND
April 25-26, 2023	588.51	607.74	588.00	585.15	595.48	595.22	588.13	588.18	591.90	590.13	ABAND	584.92	586.46	587.94	583.60	584.62	ABAND	597.35	596.81	598.09	583.17	ABAND
Bottom of Well Elevation (ft)	591.72	612.72	591.32	595.60	600.72	601.84	591.32	590.98	573.20	582.58	572.22	568.90	546.13	575.93	574.02	574.12	593.62	596.47	592.14	591.75	568.75	0.00

Notes:
NM = not measured
ABAND = abandoned

Created by: MDB Date: 5/6/2013
Last revision by: MDB Date: 5/3/2023
Checked by: REO Date: 5/4/2023

1: Well broken
2: Well casings at 7-OW, 7A, and 29-OW were cut down to allow the protective covers to close. 7-OW was cut down by 0.22 ft, 7A was cut down by 0.29 ft, and 29-OW was cut down by 0.17 ft.
Top of casing elevations in this table were adjusted accordingly.
*: Well was frozen

^: Monitoring well adjustments and resurveys:
Monitoring well 38R-OW was extended on October 30, 2020 during repairs following well damage by pond closure construction equipment.
Monitoring Well 40-OW cut down to have a top of casing elevation of 586.05 famsl on December 3, 2021.
All active monitoring wells were resurveyed in January 2023. These elevations are retroactively applied to 2022 monitoring events.

I:\25223068.00\Deliverables\2023 April ASD Edg Closed\Tables\[Table 3A - GW Elevations State.xls]levels

Table 3B. Groundwater Elevations - CCR Monitoring Wells
WPL - Edgewater 1-4 (Closed) Ash Disposal Facility /
SCS Engineers Project #25223068.00

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	**MW-301**	**MW-302**	**MW-303**	**2R-OW**
Top of Casing Elevation (feet AMSL)[1,2,3]	606.90	607.70	604.78	611.85
Screen Length (ft)	5.00	5.00	5.00	10.00
Total Depth (ft from top of casing)	27.47	40.00	33.26	14.50
Top of Well Screen Elevation (ft)	581.95	580.15	579.60	608.22
Measurement Date				
April 8, 2016	599.75	596.19	589.04	609.68
June 20, 2016	598.30	595.68	587.22	606.70
August 9, 2016	598.00	595.53	587.72	605.74
October 20, 2016	598.50	595.46	588.37	607.27
January 23-24, 2017	597.10	596.30	588.84	609.64
April 6, 2017	600.04	593.57	589.04	609.72
October 24, 2017	598.77	595.86	588.44	607.63
August 1, 2017	597.40	595.22	587.36	604.59
October 24, 2017	597.20	595.25	587.97	601.74
April 2, 2018	598.54	595.71	588.77	607.87
October 1, 2018	597.60	595.28	588.17	604.61
April 8, 2019	598.92	595.68	588.88	609.50
October 7, 2019	599.56	595.58	588.77	609.39
June 26, 2020	597.89	NM	NM	NM
October 15, 2020	595.10	590.18	585.07	604.27
April 14, 2021	596.81	592.18	586.89	608.50
October 26, 2021	592.32	591.44	585.95	604.04
April 13, 2022	597.37	593.05	587.99	608.63
October 6, 2022	592.69	591.96	586.42	601.93
April 25-26, 2023	597.77	593.63	587.99	607.74
Bottom of Well Elevation (ft)	576.95	575.15	578.73	598.22

Notes:
NM = not measured
(1): MW-302 and MW-303 were shortened in September 2020 due to site regrading during pond closure. The wells were resurveyed in November 2020.
(2): MW-301 was extended in November 2020 due to site regrading during pond closure. The well was resurveyed in November 2020.
(3): All site wells were re-surveyed in January 2023, and elevations were tied to NGS benchmark PID #DE7593.

Created by:	MDB	Date:	6/27/2016
Last rev. by:	MDB	Date:	5/2/2023
Checked by:	REO	Date:	5/4/2023
Scientist QA/QC:	TK	Date:	10/24/2023

I:\25223068.00\Deliverables\2023 April ASD Edg Closed\Tables\[Table 3B - GW Elevations CCR.xlsx]levels

Table 4. 2016 - 2023 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25223068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	pH-Field (Standard Units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells				
2R-OW	2016-Apr	7.45	26.6	30.9
2R-OW	2016-Oct	6.98	40.4	22.9
2R-OW	2017-Apr	7.30	69.3 J	28.6
2R-OW	2017-Oct	7.66	35.2	32.9
2R-OW	2018-Apr	7.29	23.3	18.2
2R-OW	2018-Oct	7.03	41.8	35.5
2R-OW	2019-Apr	8.57	40.6	12.2
2R-OW	2019-Oct	6.76	88.5	29.3
2R-OW	2020-Apr	7.40	45.8	16.9
2R-OW	2020-Oct	7.40	29.9	21.8
2R-OW	2021-Apr	7.52	31.1	22.7
2R-OW	2021-Oct	8.12	39.2	26
2R-OW	2022-Apr	7.20	25.7	14.1 M0
2R-OW	2022-Oct	7.08	36.3	28.0
2R-OW	2023-Apr	7.30	34.9	7.9 M0
3R-OW	2016-Apr	7.41	392	533
3R-OW	2016-Oct	7.32	468	372
3R-OW	2017-Apr	7.35	400	409
3R-OW	2017-Oct	7.39	389	637
3R-OW	2018-Apr	7.24	351	498
3R-OW	2018-Oct	7.03	462	495
3R-OW	2019-Apr	7.70	337	279
3R-OW	2019-Oct	6.45	454	299
3R-OW	2020-Apr	7.21	473	498
3R-OW	2020-Oct	7.57	339	654
3R-OW	2021-Apr	7.76	316	172
3R-OW	2021-Oct	7.21	260	497
3R-OW	2022-Apr	7.45	234	126
3R-OW	2022-Oct	7.19	272	567
3R-OW	2023-Apr	7.27	387	392
4R-OW	2016-Apr	7.69	7,710	120
4R-OW	2016-Oct	7.71	17,300	252
4R-OW	2017-Apr	7.44	12,600	180
4R-OW	2017-Oct	7.31	15,700	178
4R-OW	2018-Apr	7.51	12,700	164
4R-OW	2018-Oct	7.22	8,630	129
4R-OW	2019-Apr	6.67	10,200	158
4R-OW	2019-Oct	7.51	9,200	161
4R-OW	2020-Apr	7.40	9,320	90.9
4R-OW	2020-Oct	7.57	10,200	134
4R-OW	2021-Apr	8.16	10,800	191
4R-OW	2021-Oct	7.62	10,400	140
4R-OW	2022-Apr	7.67	8,930	76
4R-OW	2022-Oct	7.47	8,840	112
4R-OW	2023-Apr	7.28	8,200	95.5
5-OW	2016-Apr	7.64	4,330	215
5-OW	2016-Oct	7.75	5,970	210
5-OW	2017-Apr	7.51	5,490	258
5-OW	2017-Oct	7.54	6,040	230
5-OW	2018-Apr	7.90	3,900	143
5-OW	2018-Oct	7.43	6,180	226
5-OW	2019-Apr	6.74	4,140	197
5-OW	2019-Oct	7.19	4,680	179
5-OW	2020-Apr	--	4,610	199
5-OW	2020-Oct	7.78	4,870	161
5-OW	2021-Apr	8.31	2,670	111
5-OW	2021-Oct	7.82	3,250	100
5-OW	2022-Apr	7.75	2,280	82.1
5-OW	2022-Oct	7.62	3,830	101
5-OW	2023-Apr	7.99	1,550	21.0

Table 4. 2016 - 2023 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25223068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	pH-Field (Standard Units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)				
7-OW	2016-Apr	8.14	610	255
7-OW	2016-Oct	7.59	964	251
7-OW	2017-Apr	8.10	761	259
7-OW	2017-Oct	7.73	1,130	246
7-OW	2018-Apr	8.08	818	243
7-OW	2018-Oct	7.69	1150	218
7-OW	2019-Apr	7.85	914	254
7-OW	2019-Oct	7.47	1,200	224
7-OW	2020-Apr	8.01	928	214
7-OW	2020-Oct	7.74	1,290	242
7-OW	2021-Apr	8.12	961	247
7-OW	2021-Oct	7.94	1,350	224
7-OW	2022-Apr	7.47	1,110	225
7-OW	2022-Oct	7.80	1,210	189
7-OW	2023-Apr	7.69	1,090	213
29-A	2016-Apr	9.07	357	40.9
29-A	2016-Oct	8.54	264	39.6
29-A	2017-Apr	9.09	365	41.5
29-A	2017-Oct	8.97	278	42.1
29-A	2018-Apr	8.72	264	39.4
29-A	2018-Oct	8.38	268	39.2
29-A	2019-Apr	8.10	292	44.2
29-A	2019-Oct	8.81	258	39.1
29-A	2020-Apr	8.82	268	37.5
29-A	2020-Oct	8.90	263	42.9
29-A	2021-Apr	8.62	262	214
29-A	2021-Oct	9.35	233	40.8
29-A	2022-Apr	7.94	250	39.6
29-A	2022-Oct	8.82	495	44.3
29-A	2023-Apr	8.86	268	44.1
29-OW	2016-Apr	8.03	10,600	120
29-OW	2016-Oct	7.69	10,900	85.7
29-OW	2017-Apr	8.49	9,500	77.0
29-OW	2017-Oct	8.15	9,060	62.0
29-OW	2018-Apr	7.97	8,640	102
29-OW	2018-Oct	7.84	11,000	109
29-OW	2019-Apr	7.89	10,600	190
29-OW	2019-Oct	7.57	10,800	114
29-OW	2020-Apr	7.90	9,160	69.9
29-OW	2020-Oct	8.09	8,480	73.3
29-OW	2021-Apr	8.2	7,120	66.4
29-OW	2021-Oct	8.59	8,700	86.7
29-OW	2022-Apr	7.55	9,160	77.2
29-OW	2022-Oct	7.76	9,160	70.2
29-OW	2023-Apr	8.10	8,570	69.2
30-OW	2016-Apr	8.26	79.1	4.80
30-OW	2016-Oct	7.56	113	4.60
30-OW	2017-Apr	8.47	176	7.50
30-OW	2017-Oct	7.44	135	16.7
30-OW	2018-Apr	7.96	94.5	21.5
30-OW	2018-Oct	7.47	115	11.4
30-OW	2019-Apr	8.07	52.1	2.40 J
30-OW	2019-Oct	7.37	84.9	5.60
30-OW	2020-Apr	7.61	54.4	2.80
30-OW	2020-Oct	7.24	118	15.2
30-OW	2021-Apr	8.26	42.3	5.5
30-OW	2021-Oct	7.52	108	14.9
30-OW	2022-Apr	7.91	35.9	3.6
30-OW	2022-Oct	7.48	93.1	10.7
30-OW	2023-Apr	7.78	27.5	5.0

Table 4. 2016 - 2023 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25223068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	pH-Field (Standard Units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Monitoring Wells (continued)				
31-OW	2016-Apr	7.63	114	91.2
31-OW	2016-Oct	7.68	34.7	63.3
31-OW	2017-Apr	7.99	76.9	82.4
31-OW	2017-Oct	7.79	190	70.3
31-OW	2018-Apr	7.71	30.8	51.5
31-OW	2018-Oct	7.64	36.7	62.7
31-OW	2019-Apr	7.95	18.5	68.6
31-OW	2019-Oct	7.41	38.6	57.5
31-OW	2020-Apr	7.54	25.8	39.1
31-OW	2020-Oct	7.69	30.8	58.5
31-OW	2021-Apr	8.33	51	59.5
31-OW	2021-Oct	7.47	39.5	35
31-OW	2022-Apr	7.94	32.2	26.5
31-OW	2022-Oct	7.66	48.3	30.4
31-OW	2023-Apr	7.72	30.7	35.2
40-OW	2016-Apr	8.04	8,030	731
40-OW	2016-Oct	7.91	29,400	768
40-OW	2017-Apr	7.97	8,680	849
40-OW	2017-Oct	7.91	8,800	873
40-OW	2018-Apr	7.93	9,790	771
40-OW	2018-Oct	7.51	11,300	797
40-OW	2019-Apr	6.80	8,620	636
40-OW	2019-Oct	7.53	10,600	836
40-OW	2020-Apr	7.83	10,900	836
40-OW	2020-Oct	8.03	9,870	818
40-OW	2021-Apr	8.23	8,010	827
40-OW	2021-Oct	8.53	9,180	839
40-OW	2022-Apr	7.68	10,000	807
40-OW	2022-Oct	8.03	8,840	748
40-OW	2023-Apr	8.01	7,670	709
Leachate Monitoring Wells				
37-OW	2016-Apr	7.49	19,100	759
37-OW	2016-Oct	7.31	12,500	439
37-OW	2017-Apr	8.01	15,900	633
37-OW	2017-Oct	7.24	9,440	264
37-OW	2018-Apr	7.68	5,890	159
37-OW	2018-Oct	7.42	16,600	555
37-OW	2019-Apr	7.57	15,800	492
37-OW	2019-Oct	7.13	16,300	798
37-OW	2020-Apr	7.70	20,200	769
37-OW	2020-Oct	--	--	--
37-OW	2021-Apr	--	--	--
37-OW	2021-Oct	--	--	--
37-OW	2022-Apr	--	--	--
37-OW	2022-Oct	--	--	--
37-OW	2023-Apr	--	--	--
38R-OW	2016-Apr	8.00	33,800	1,000
38R-OW	2016-Oct	7.71	17,100	514
38R-OW	2017-Apr	7.86	21,100	932
38R-OW	2017-Oct	7.72	10,800	364
38R-OW	2018-Apr	7.72	4,250	123
38R-OW	2018-Oct	7.98	32,400	956
38R-OW	2019-Apr	7.64	9,720	330
38R-OW	2019-Oct	8.06	30,400	1,020
38R-OW	2020-Apr	8.20	51,800	1,520
38R-OW	2020-Oct	--	--	--
38R-OW	2021-Apr	7.65	37,400	1,380
38R-OW	2021-Oct	7.48	38,400	1,310
38R-OW	2022-Apr	--	--	--
38R-OW	2022-Oct	7.40	41,700	1,420
38R-OW	2023-Apr	7.40	44,800	1,220 M0

Table 4. 2016 - 2023 Groundwater Analytical Results -
Closed Landfill State Monitoring Program Wells
WPL - Edgewater Generating Station / SCS Project #25223068.00
Sheboygan, Wisconsin

Point Name	Reporting Period	pH-Field (Standard Units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO_4)
Leachate Monitoring Wells (continued)				
39R-OW	2016-Apr	7.26	10,100	534
39R-OW	2016-Oct	7.32	29,900	1,390
39R-OW	2017-Apr	7.44	22,400	1,150
39R-OW	2017-Oct	7.52	32,800	1,400
39R-OW	2018-Apr	--	28,800	772
39R-OW	2018-Oct	7.40	24,700	1,160
39R-OW	2019-Apr	7.14	26,000	1,520
39R-OW	2019-Oct	7.13	17,100	601
39R-OW	2020-Apr	7.42	19,100	1,160
39R-OW	2020-Oct	7.69	34,200	1,190
39R-OW	2021-Apr	7.95	24,800	1,140
39R-OW	2021-Oct	--	--	--
39R-OW	2022-Apr	--	--	--
39R-OW	2022-Oct	--	--	--
39R-OW	2023-Apr	7.4	16,800	261

Abbreviations:
µg/L = micrograms per liter or parts per billion (ppb)
mg/L = milligrams per liter or parts per million (ppm)

Notes:
-- : not measured

Laboratory Notes:
J = Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

Created by:	SCC	Date:	2/24/2014
Last revision by:	RM	Date:	9/20/2023
Checked by:	NLB	Date:	9/20/2023

I:\25223068.00\Deliverables\2023 April ASD Edg Closed\Tables\[Tables 2 and 4 - Analytical CCR and State Monitoring.xlsx]Table 4. GW quality Data

Table 5. Analytical Results - Closed Landfill Leachate Fluoride Monitoring
Edgewater Generating Station, Sheboygan, Wisconsin
SCS Engineers Project #25222068.00

Collection Date	Fluoride (mg/L)			
	36-OW	37-OW	38R-OW	39R-OW
9/8/1994	0.25	0.62	0.57	0.79
9/14/1995	0.38	0.51	0.71	0.87
9/17/1996	0.56	0.42	0.71	0.97
9/16/1997	0.60	0.44	0.73	0.97

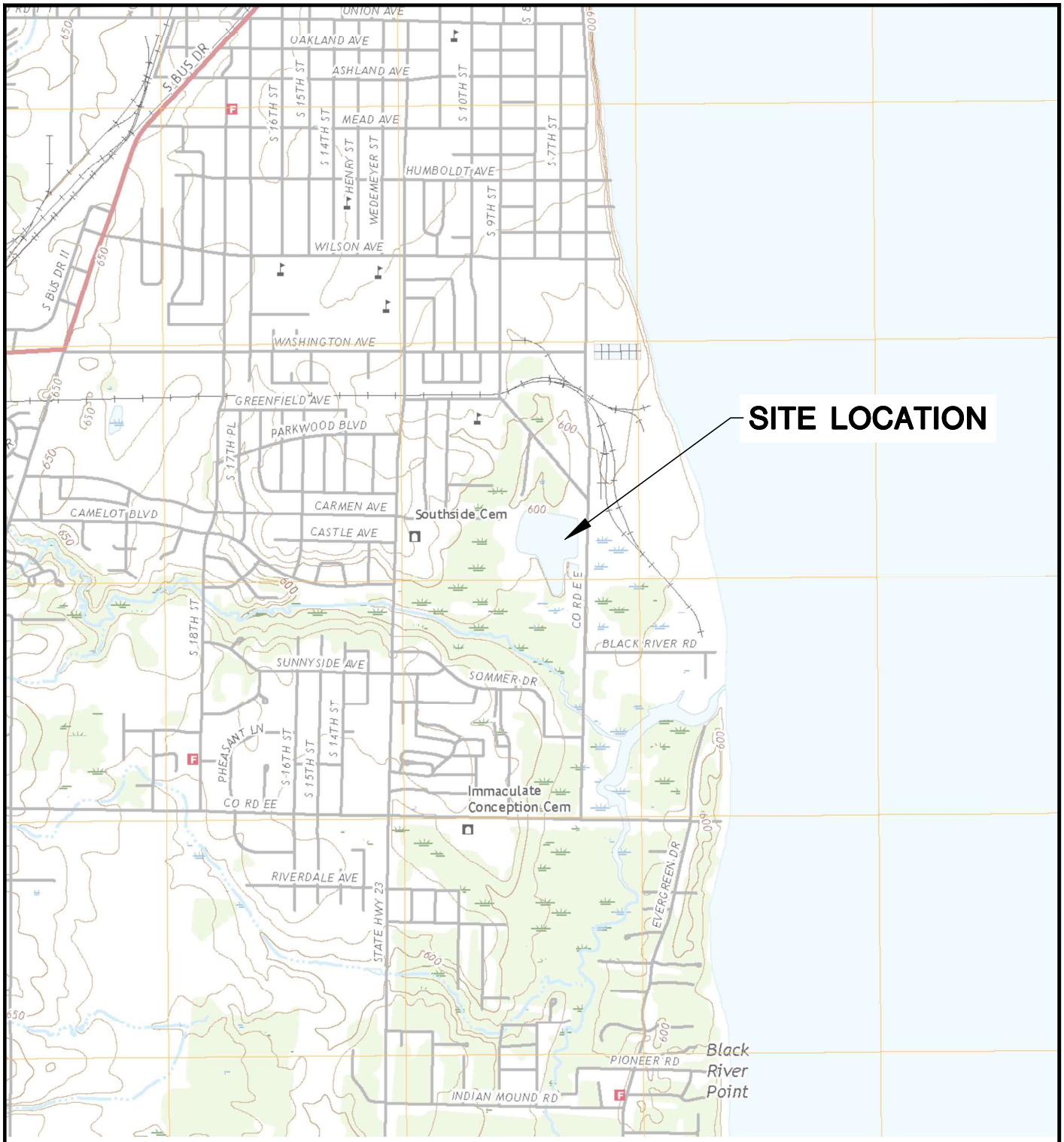
Abbreviations:
mg/L = milligrams per liter or parts per million (ppm)

Notes:
1. Data compiled from WDNR Groundwater Environmental Monitoring System (GEMS) website.

Created by:	NDK	Date:	3/5/2018
Last revision by:	NDK	Date:	3/5/2018
Checked by:	AJR	Date:	4/5/2018

I:\25222068.00\Deliverables\2022 Apr ASD Edg Closed\Tables\[Table 5 - EDG - closed-Leachate Fluoride Monitoring.xlsx]Table 5- Fl results

Figures



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

CLIENT	WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE	EDGEWATER 1–4 (CLOSED) ASH DISPOSAL FACILITY SHEBOYGAN, WISCONSIN

SITE LOCATION MAP

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

ENGINEER

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

FIGURE 1

I:\25222068.00\Drawings\Site Location Map.dwg, 1/16/2023 1:42:33 PM

LEGEND

- CCR RULE MONITORING WELL
- CCR RULE BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL
- ADDITIONAL PIEZOMETER
- ABANDONED MONITORING WELL
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. CCR UNIT LIMITS AND CLOSED LANDFILL LOCATION ARE APPROXIMATE.
4. MONITORING WELLS MW-301, MW-302, AND MW-303 WERE INSTALLED BY BADGER STATE DRILLING BETWEEN JANUARY 14 AND FEBRUARY 4, 2016.
5. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER GENERATING STATION IS 2R-OW.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25222068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/16/2023	APPROVED BY:	TK, 1/16/2023

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

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE 2

\\Mad-fs01\data\Projects\25222068.00\Drawings\Site Plan and Monitoring Well Locations.dwg, 1/16/2023 1:43:35 PM

N

LEGEND

- ABANDONED MONITORING WELL
- CCR MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- ABANDONED STAFF GAUGE
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54 — WATER TABLE ELEVATION (APRIL 25–26, 2023)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTES:

1. AERIAL PHOTOGRAPH FROM ARCMAP WORLDMAP: MAXAR. DATE OF IMAGE IS APRIL 3, 2021.
2. EXISTING WELL LOCATIONS ARE APPROXIMATE AND ARE BASED ON OCTOBER 2011 WATER TABLE MAP PREPARED BY TRC.
3. DESIGN MANAGEMENT ZONE LOCATION IS APPROXIMATE
4. NEW MONITORING WELL LOCATIONS WERE SURVEYED BY CQM, INC. ON FEBRUARY 12, 2016.
5. MW-301, MW-302, AND MW-303 ARE NOT INCLUDED IN THE WDNR-APPROVED SITE-SPECIFIC MONITORING PLAN
6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON APRIL 25–26, 2023.

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25223068.00	DRAWN BY:	KP
DRAWN:	07/20/2023	CHECKED BY:	NB
REVISED:	08/24/2023	APPROVED BY:	TK 10/24/2023

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

CLIENT: WISCONSIN POWER AND LIGHT
EDGEWATER GENERATING STATION
3739 LAKESHORE DRIVE
SHEBOYGAN, WI 53081

SITE: EDGEWATER 1-4 (CLOSED)
ASH DISPOSAL FACILITY
SHEBOYGAN, WISCONSIN

WATER TABLE MAP
APRIL 2023

FIGURE 3

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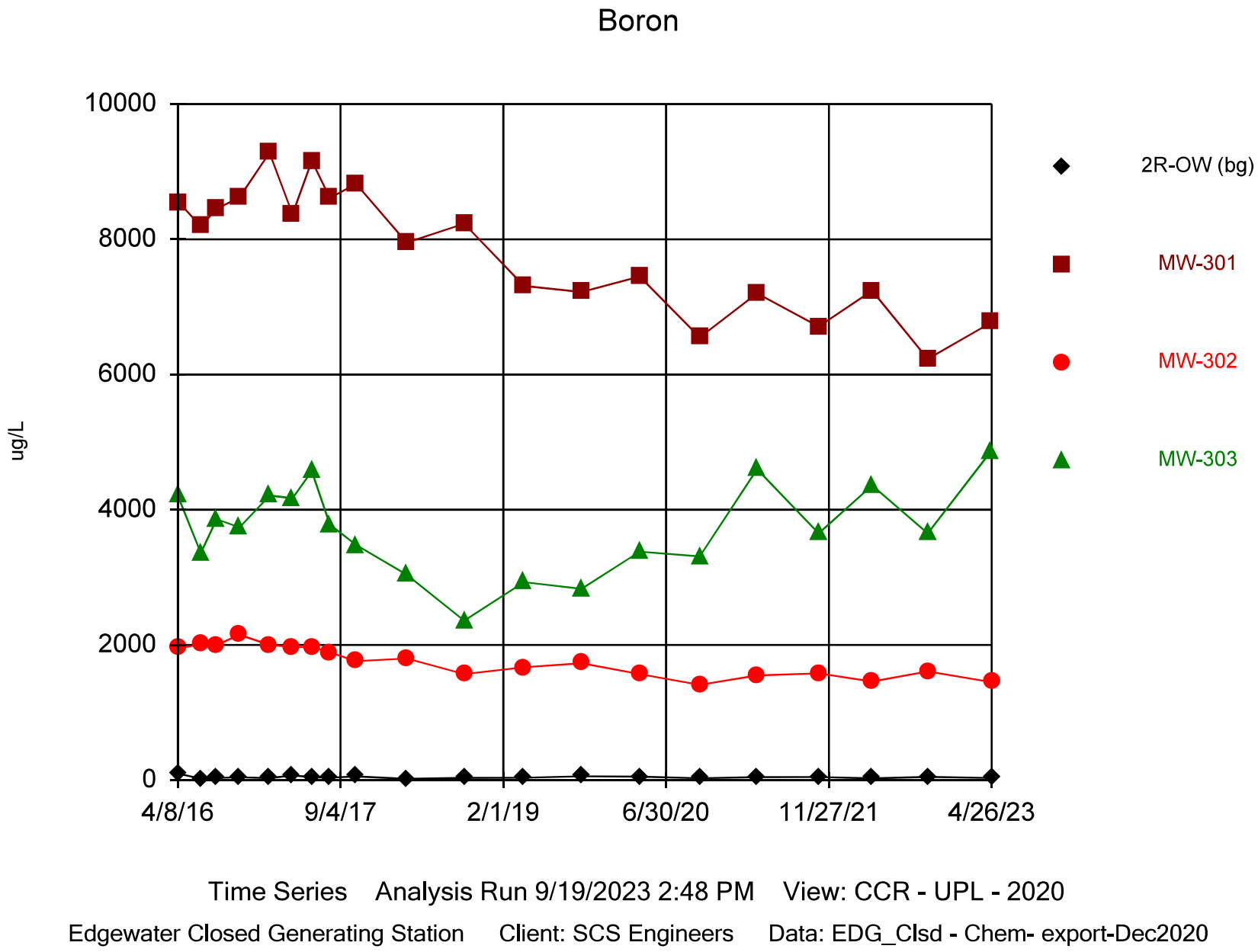
Appendix A

Trend Plots for CCR Wells

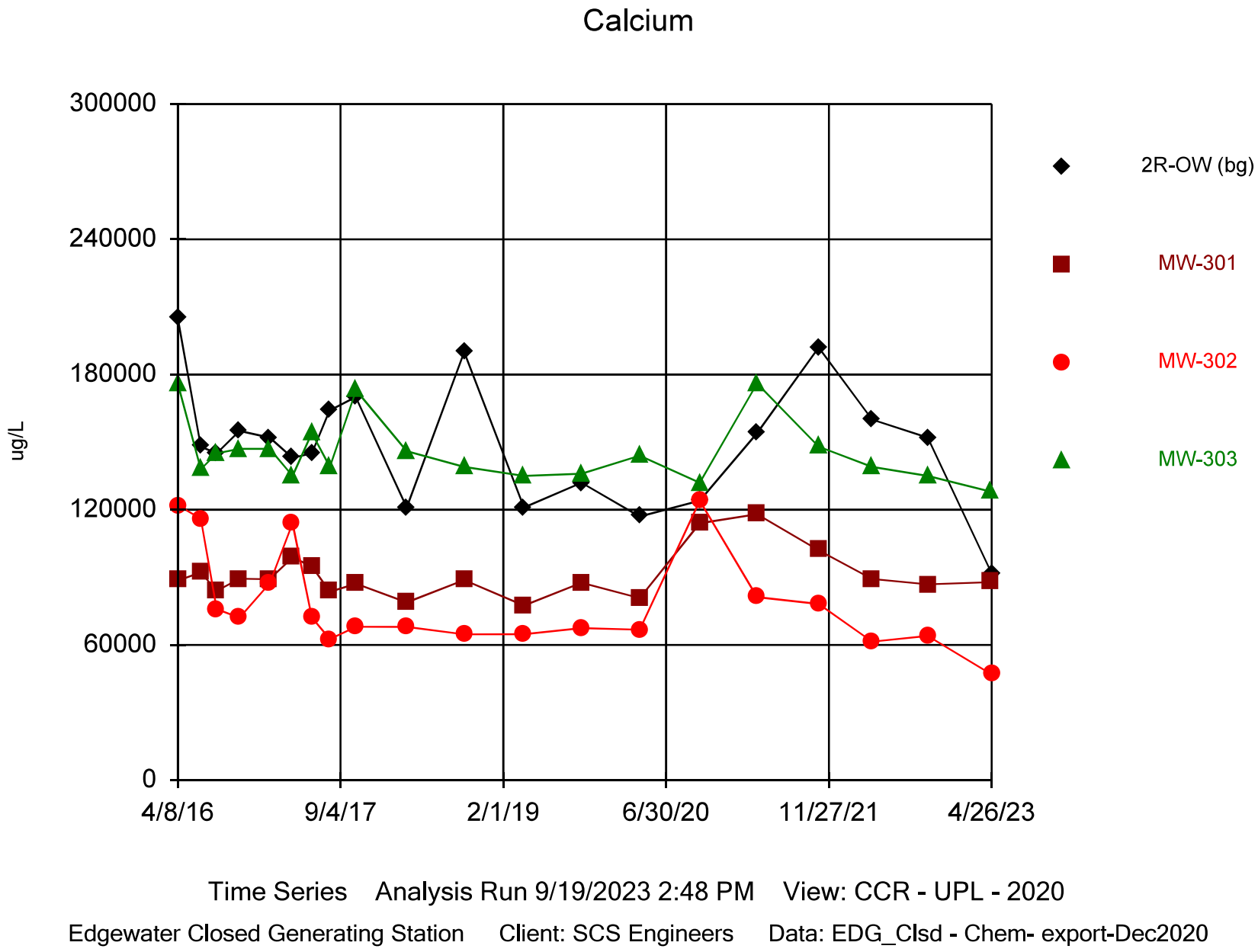

Boron
10000
8000
6000
4000
2000
0
ug/L
4/8/16
9/4/17
2/1/19
6/30/20
11/27/21
4/26/23
2R-OW (bg)
MW-301
MW-302
MW-303
Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Boron (ug/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	100		1950	4210
4/11/2016		8550		
6/20/2016	22.4	8190	2010	3360
8/9/2016	32.6	8450	2000	3860
10/20/2016	43.1	8620	2150	3740
1/23/2017		9280		
1/24/2017	31.2		2000	4210
4/6/2017	70.6	8370	1970	4170
6/6/2017	45.2	9160	1970	4570
8/1/2017	35.7			
8/2/2017		8610	1890	3780
10/23/2017	55.9			
10/24/2017		8820	1760	3480
4/2/2018	19.7	7950	1800	3040
10/1/2018	34.7	8230	1570	2360
4/8/2019	35.8	7310	1670	2930
10/7/2019	58.8	7220	1730	2830
4/8/2020	52.3	7450	1570	3380
10/15/2020	29.9	6550	1410	3310
4/14/2021	45.7	7200	1550	4600
10/26/2021	47.2	6710	1580	3650
4/13/2022	27.9	7240	1460	4360
10/6/2022	49	6230	1610	3650
4/25/2023		6770		4870
4/26/2023	32		1450	

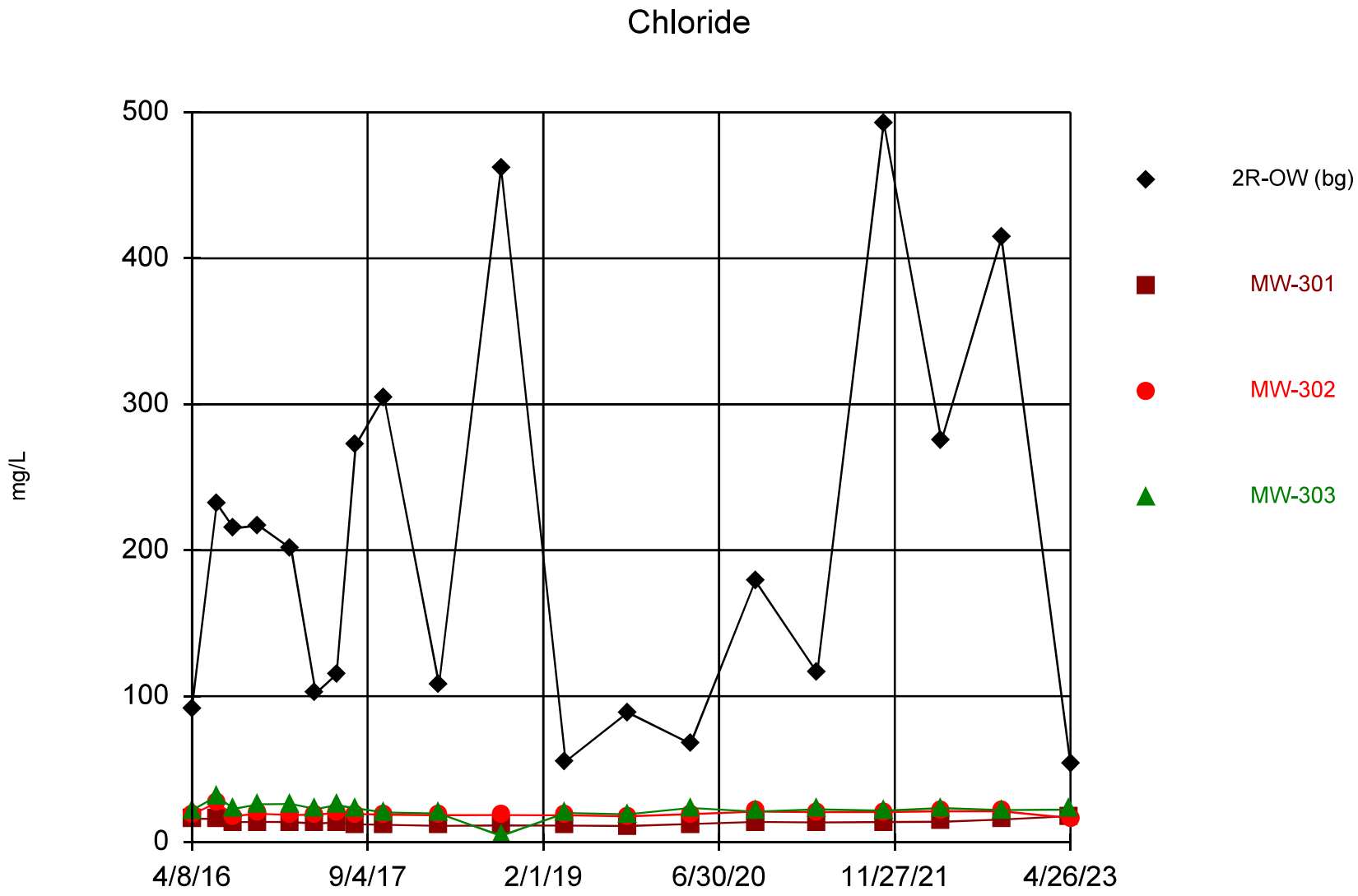

Calcium
300000
240000
180000
120000
60000
0
ug/L
4/8/16
9/4/17
2/1/19
6/30/20
11/27/21
4/26/23
2R-OW (bg)
MW-301
MW-302
MW-303
Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Calcium (ug/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	205000		122000	176000
4/11/2016		88700		
6/20/2016	148000	92200	116000	138000
8/9/2016	145000	84000	75900	145000
10/20/2016	155000	89400	72100	147000
1/23/2017		89200		
1/24/2017	152000		87400	147000
4/6/2017	143000	98800	114000	135000
6/6/2017	145000	94900	72200	154000
8/1/2017	164000			
8/2/2017		83600	62600	139000
10/23/2017	170000			
10/24/2017		87200	68100	173000
4/2/2018	121000	78900	68000	146000
10/1/2018	190000	88800	64700	139000
4/8/2019	121000	77500	64800	135000
10/7/2019	132000	87600	67500	136000
4/8/2020	117000	80800	66800	144000
10/15/2020	124000	114000	124000	132000
4/14/2021	154000	118000	81200	176000
10/26/2021	192000	102000	78200	148000
4/13/2022	160000	89300	61500	139000
10/6/2022	152000	86900	64000	135000
4/25/2023		87900		128000
4/26/2023	91800		46900	



Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

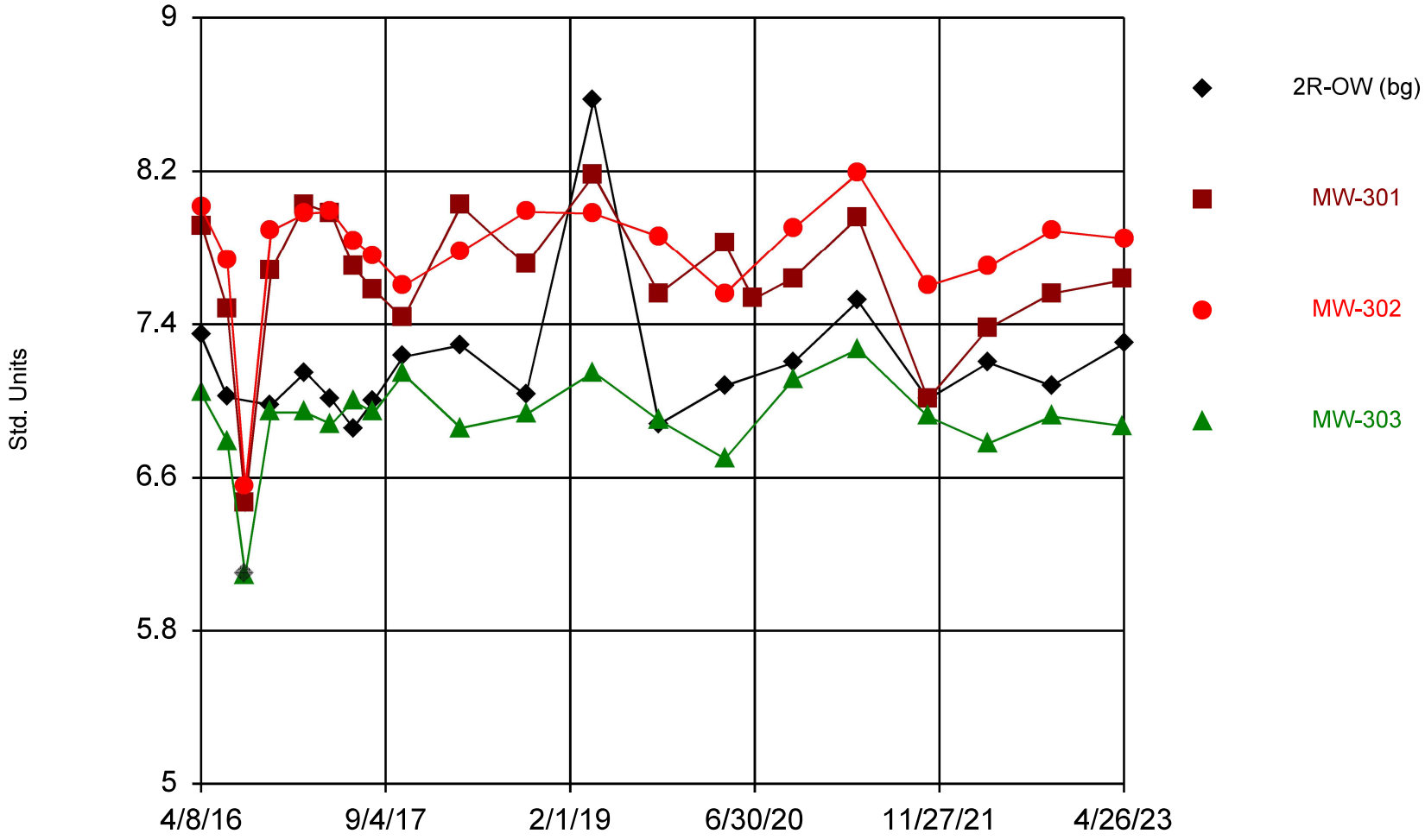
Time Series

Constituent: Chloride (mg/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	91.7		18.9	21.8
4/11/2016		16.2		
6/20/2016	232	15.9	27.2	31.5
8/9/2016	215	13.7	18	22.8
10/20/2016	217	13.9	19.5	26
1/23/2017		13.8		
1/24/2017	201		18.6	26.2
4/6/2017	102	12.7	18.9	22.7
6/6/2017	115	13.5	20	25.4
8/1/2017	272			
8/2/2017		12.3	19.3	23.2
10/23/2017	305			
10/24/2017		11.9	18.9	20.4
4/2/2018	108	11.2	18.5	19.7
10/1/2018	462	11.5	18.6	4.3
4/8/2019	55.3	11.4	18.4	20
10/7/2019	88.8	11.1	17.8	19.1
4/8/2020	67.5	12.5	19.2	23.5
10/15/2020	179	13.9	20.9	20.9
4/14/2021	116	13.5	20.6	22.5
10/26/2021	493	13.8	20.7	21.6
4/13/2022	275	14	21.2	23.4
10/6/2022	414	15.5	21.2	22
4/25/2023		17.9		22.3
4/26/2023	53.4		16.5	

Field pH



Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

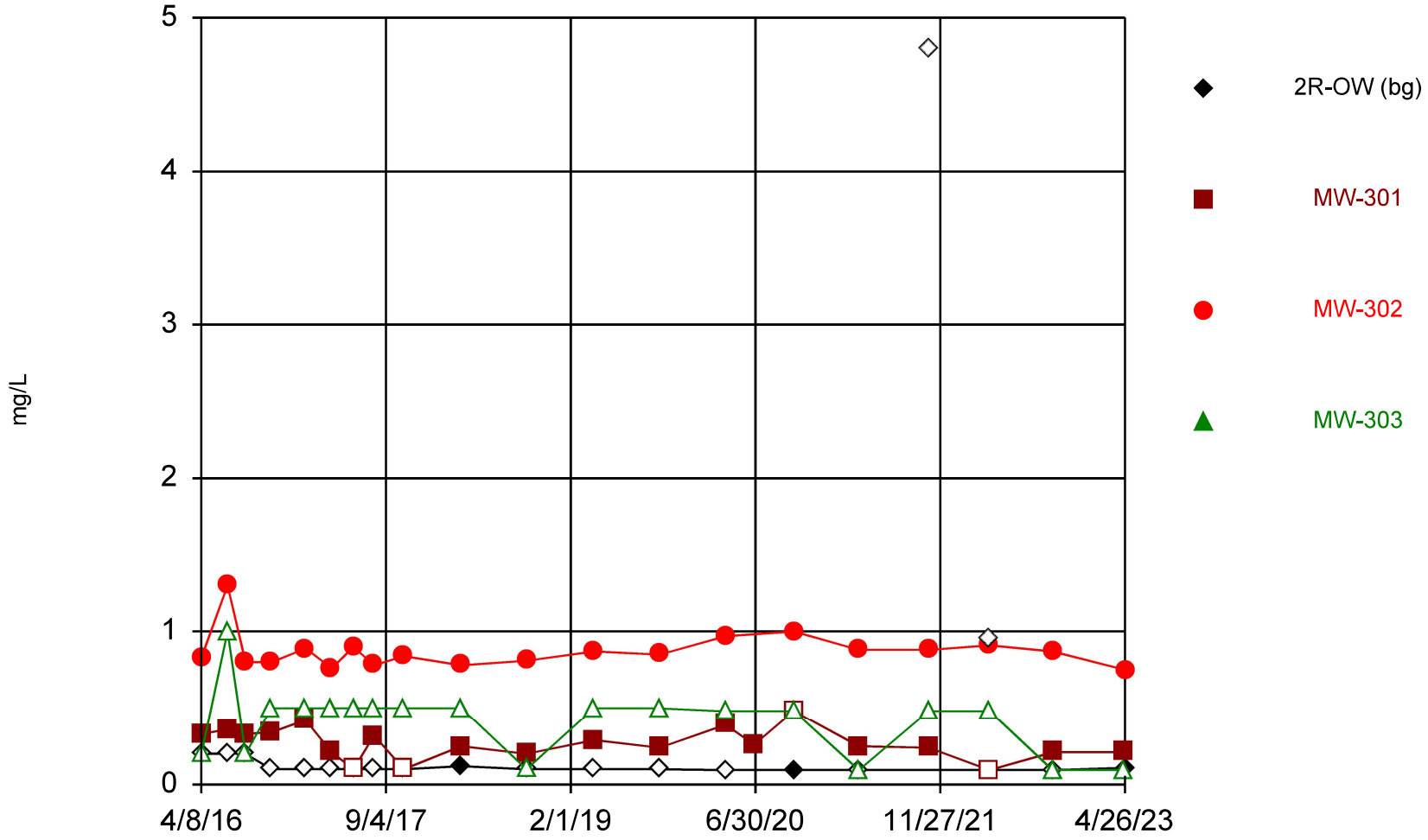
Constituent: Field pH (Std. Units) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	7.34		8.01	7.04
4/11/2016		7.91		
6/20/2016	7.02	7.48	7.73	6.79
8/9/2016	6.1 (X)	6.47	6.55	6.09
10/20/2016	6.98	7.68	7.89	6.94
1/23/2017		8.03		
1/24/2017	7.15		7.98	6.94
4/6/2017	7.01	7.98	7.99	6.88
6/6/2017	6.86	7.7	7.84	7
8/1/2017	7			
8/2/2017		7.58	7.76	6.94
10/23/2017	7.23			
10/24/2017		7.43	7.6	7.14
4/2/2018	7.29	8.02	7.78	6.86
10/1/2018	7.03	7.71	7.99	6.93
4/8/2019	8.57	8.18	7.98	7.15
10/7/2019	6.88	7.56	7.86	6.9
4/8/2020	7.08	7.82	7.56	6.7
6/26/2020		7.53		
10/15/2020	7.2	7.64	7.9	7.11
4/14/2021	7.52	7.96	8.19	7.27
10/26/2021	7.01	7.01	7.6	6.92
4/13/2022	7.2	7.38	7.7	6.78
10/6/2022	7.08	7.56	7.89	6.92
4/25/2023		7.63		6.87
4/26/2023	7.3		7.85	

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Fluoride (mg/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	<0.2 (U)		0.83	<0.2 (U)
4/11/2016		0.33 (J)		
6/20/2016	<0.2 (U)	0.36 (J)	1.3 (J)	<1 (U)
8/9/2016	<0.2 (U)	0.33 (J)	0.8	<0.2 (U)
10/20/2016	<0.1 (U)	0.34	0.8	<0.5 (U)
1/23/2017		0.42		
1/24/2017	<0.1 (U)		0.89 (J)	<0.5 (U)
4/6/2017	<0.1 (U)	0.21 (J)	0.76	<0.5 (U)
6/6/2017	<0.1 (U)	<0.1 (U)	0.9	<0.5 (U)
8/1/2017	<0.1 (U)			
8/2/2017		0.32	0.78	<0.5 (U)
10/23/2017	<0.1 (U)			
10/24/2017		<0.1 (U)	0.84	<0.5 (U)
4/2/2018	0.12 (J)	0.25 (J)	0.78	<0.5 (U)
10/1/2018	<0.1 (U)	0.2 (J)	0.81	<0.1 (U)
4/8/2019	<0.1 (U)	0.29 (J)	0.87	<0.5 (U)
10/7/2019	<0.1 (U)	0.24 (J)	0.85	<0.5 (U)
4/8/2020	<0.095 (U)	0.39	0.97	<0.48 (U)
6/26/2020		0.26 (J)		
10/15/2020	0.096 (J)	<0.48 (U)	1 (J)	<0.48 (U)
4/14/2021	<0.095 (U)	0.25 (J)	0.88	<0.095
10/26/2021	<4.8 (UX)	0.24 (J)	0.88	<0.48
4/13/2022	<0.95 (UX)	<0.095 (U)	0.91	<0.48 (U)
10/6/2022	<0.095 (U)	0.21 (J)	0.87	<0.095 (U)
4/25/2023		0.21 (J)		<0.095 (U)
4/26/2023	0.11 (J)		0.75	

ND substitution: RL or RL/2 if <15% NDs.

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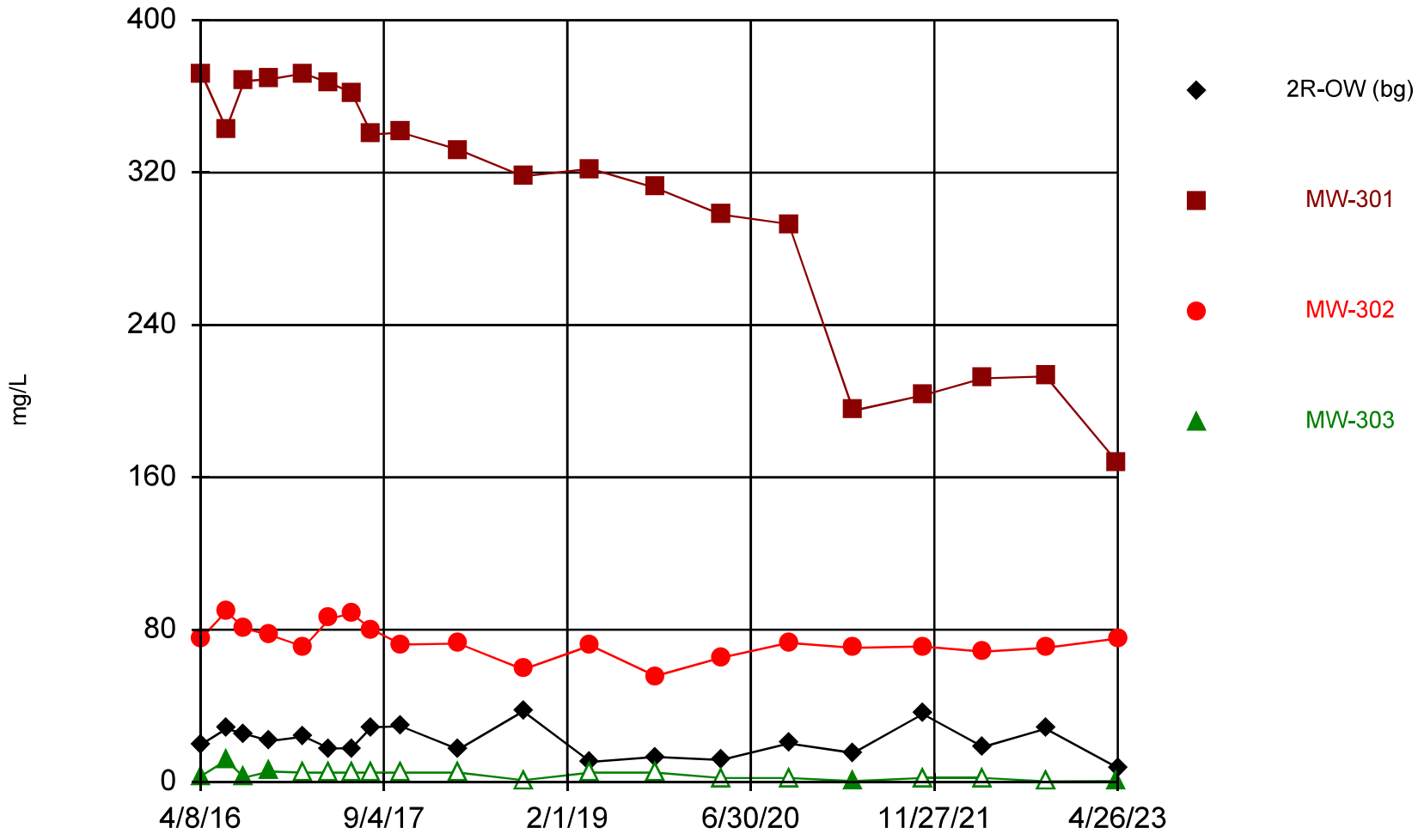
Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 9/19/2023 2:48 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

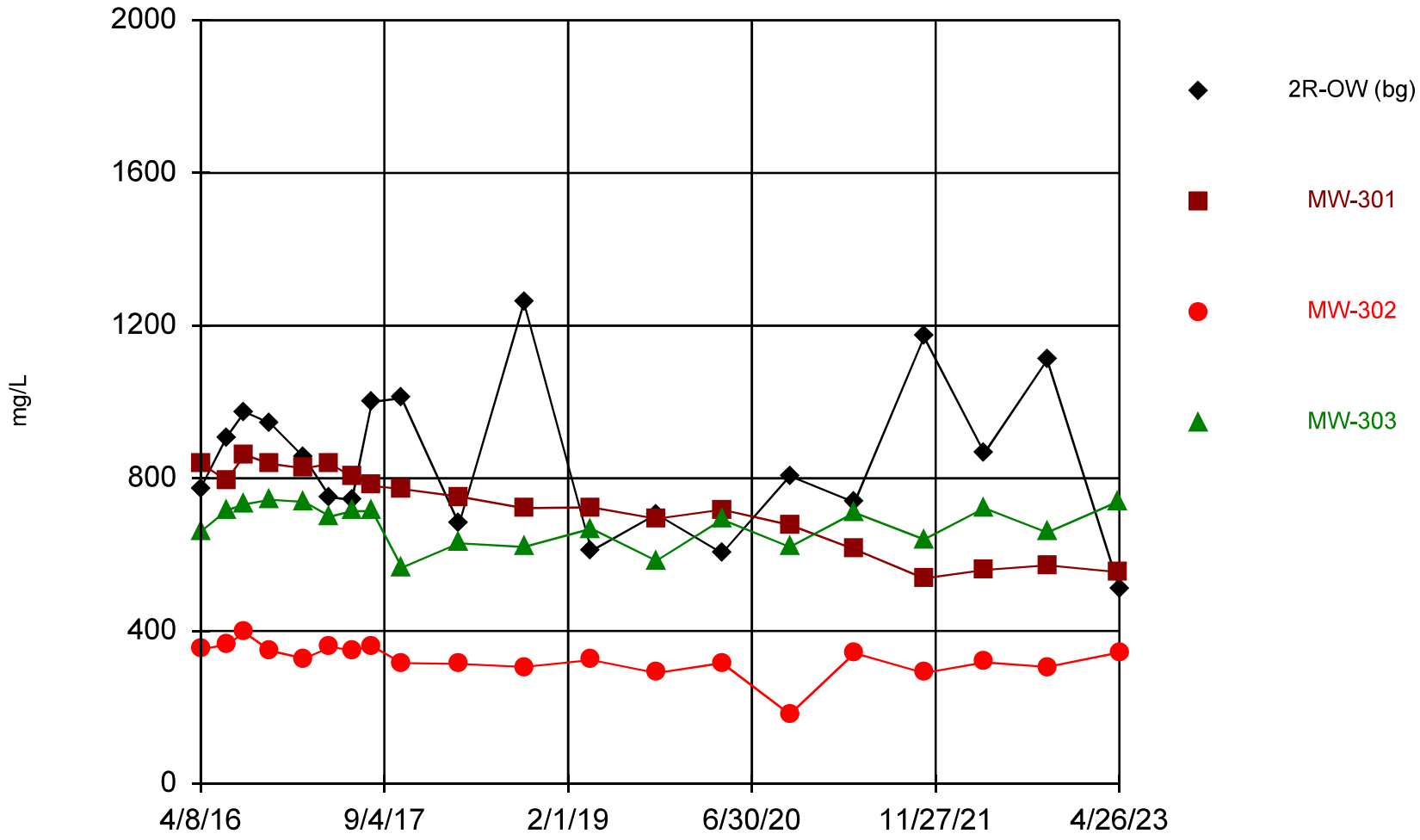
Constituent: Sulfate (mg/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	19.5		75.1	3 (J)
4/11/2016		372		
6/20/2016	28	343	89.6	11.4 (J)
8/9/2016	25.4	368	80.7	2.4 (J)
10/20/2016	21.6	369	77.2	5.6 (J)
1/23/2017		372		
1/24/2017	23.9		71.1	<5 (U)
4/6/2017	17.6	367	85.8	<5 (U)
6/6/2017	17.8	362	88.5	<5 (U)
8/1/2017	28.8			
8/2/2017		340	80.2	<5 (U)
10/23/2017	29.3			
10/24/2017		341	72.2	<5 (U)
4/2/2018	17.2	332	72.7	<5 (U)
10/1/2018	37.2	318	59.2	<1 (U)
4/8/2019	10.6	322	71.7	<5 (U)
10/7/2019	13.2	312	55.7	<5 (U)
4/8/2020	11.6	298	65.3	<2.2 (U)
10/15/2020	20.3	293	73.1	<2.2 (U)
4/14/2021	15.3	195	70.5	0.54 (J)
10/26/2021	35.7 (J)	203	71.2	<2.2 (U)
4/13/2022	18.5 (J)	212	68.5	<2.2 (U)
10/6/2022	28	213	70.5	<0.44 (U)
4/25/2023		168		0.5 (J)
4/26/2023	7.5		75.4	

ND substitution: RL or RL/2 if <15% NDs.

Total Dissolved Solids



Time Series Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 9/19/2023 2:49 PM View: CCR - UPL - 2020
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	774		352	660
4/11/2016		838		
6/20/2016	908	794	364	716
8/9/2016	974	862	396	732
10/20/2016	944	838	348	744
1/23/2017		826		
1/24/2017	854		328	738
4/6/2017	750	838	358	700
6/6/2017	744	804	350	714
8/1/2017	1000			
8/2/2017		780	360	714
10/23/2017	1010			
10/24/2017		772	316	566
4/2/2018	680	752	314	630
10/1/2018	1260	722	306	620
4/8/2019	610	724	324	668
10/7/2019	706	694	290	584
4/8/2020	604	718	316	692
10/15/2020	806	678	182	620
4/14/2021	737	614	342	710
10/26/2021	1170	538	290	640
4/13/2022	866	560	318	722
10/6/2022	1110	572	306	658
4/25/2023		554		740
4/26/2023	512		344	

Appendix F

July 2023 UPL Update Memorandum

July 28, 2023
File No. 25223068.00

TECHNICAL MEMORANDUM

SUBJECT: Statistical Evaluation of Groundwater Monitoring Results – UPL Update
Edgewater Generating Station

PREPARED BY: Ryan Matzuk

CHECKED BY: Sherren Clark

STATISTICAL METHOD

Groundwater monitoring data for the multiunit system at the Edgewater Generating Station (EDG), is evaluated in accordance with 40 CFR 257.93(f)(3), using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit.

Statistical evaluation is performed using commercially available software (*Sanitas for Groundwater*© or similar) in general accordance with the USEPA's *Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* dated March 2009 (Unified Guidance) (USEPA, 2009) and generally accepted procedures.

The EDG monitoring data includes one background monitoring well, 2R-OW, and three compliance monitoring wells, MW-301, MW-302, and MW-303. The statistical analysis includes an interwell evaluation for the Appendix III parameters.

The initial UPLs were calculated based on eight rounds of background monitoring performed prior to the initiation of compliance monitoring for the EDG CCR units, from April 2016 through August 2017. Since then, additional rounds of monitoring for Appendix III parameters have been performed at the background well. As part of the evaluation of the April 2023 monitoring results, the background data set for the UPL calculations is being updated to include data from the background well collected through October 2020. This memo addresses updated UPLs for Appendix III parameters.

TIME SERIES PLOTS

Time series plots are prepared for the required monitoring parameters to show the concentration variations over time. Time series graphs are included in **Attachment 1**.

OUTLIER ANALYSIS - INTERWELL

For interwell analysis, an outlier evaluation is performed for background monitoring results at the upgradient wells. A statistical outlier is a value that is extremely different from the other values in the data set. The Sanitas outlier tests identify data points that do not appear to fit the distribution of the

rest of the data set and determine if they differ significantly from the rest of the data. The outlier analysis performed in Sanitas includes the following steps:

1) Run normality test (Shapiro Wilk/Francia).

2) If normally distributed, run USEPA's 1989 Outlier Test to identify suspected outliers.
   a) If number of background samples is less than or equal to 25, run Dixon's test for suspected outliers.
   b) If number of background samples is more than 25, run Rosner's test for suspected outliers.

3) If not normally distributed, run Tukey's test for outliers.

4) Review data flagged as possible outliers to evaluate whether they should be removed from the background data set. Also review time series plots for possible outliers that were not picked up in the statistical evaluation (e.g., outlier test may not identify outliers when two values are similar to each other, but very different from all other data).

Results identified as statistical outliers are checked for possible lab instrument failure, field collection problems, or data entry errors; however, outliers may exist naturally in the data if there is an extremely wide inherent or temporal variability in the data. The Unified Guidance states that unless a likely error can be identified, the outlier should not be removed.

For the interwell evaluation of the April 2023 sampling event, the following background values were identified as potential outliers and handled as described:

- Field pH. Two results from the August 2016 and April 2019 events were flagged as statistical outliers. The low result (August 2016) was removed from the dataset because all field pH results for that event at the background and compliance wells were low, suggesting a likely field measurement issue or calibration error. The high result (April 2019) was not removed from the dataset because there was no known explanation for the higher result and it appeared to be within the range of potential natural variation.

- Fluoride. Two results from the October 2021 and April 2022 events were flagged as statistical outliers. Both the October 2021 and April 2022 results were removed from the dataset because they are non-detects and with unusually high detection limits due to high laboratory dilution factors.

Outlier analysis output from Sanitas is included in Attachment 2.

BACKGROUND UPDATE

The background data pool was updated in accordance with the Unified Guidance, which recommends updating background every 2 to 3 years for semiannual sampling. Prior to expanding the data pool, the original background data set (4/2016 through 10/2020) and the data to be added (4/2021 through 4/2023) were compared. The Unified Guidance states that recently collected measurements from the background wells can be added to the existing pool if a Student's t-test or Wilcoxon rank-sum test finds no significant difference between the two groups at the 1% level of significance.

The Sanitas background group comparison for the EDG background data sets, included in **Attachment 3**, indicated no signficant difference at the 1% level; therefore, the more recent data can be added to the background pool. The comparison uses Welch's t-test for normally distributed data and the Mann-Whitney test for non-normal data. (Note: The Sanitas output labels the earlier background dataset as "Background" and the later background dataset as "Compliance," but all data from background well 2R-OW is background data.)

INTERWELL PREDICTION LIMITS

Interwell prediction limits are calculated using background data from the upgradient monitoring well (2R-OW) for each monitored constituent, with outliers removed as noted above. During this evaluation of compliance monitoring, groundwater results from April 2016 through April 2023 were included to calculate the interwell prediction limits. The prediction limit analysis performed in Sanitas includes the following steps:

1) If 100% of the background values are non-detect, the Double Quanitification rule applies and no prediction limit is calculated.

2) If more than 50% of results are non-detect, then a non-parametric prediction limit is calculated.

3) If 50% or fewer of the results are non-detect, run normality test (Shapiro Wilk/Francia) to assess whether the data fit a normal distribution or can be transformed to fit a normal distribution (e.g., lognormal).

4) If normal or transformed normal, calculate parametric prediction limit.

5) If not normal or transformed normal, calculate non-parametric prediction limit.

Consistent with the Unified Guidance, parametric prediction limits are calculated based on a 1-of-2 retesting protocol and a 10 percent site-wide false positive rate. Sanitas establishes the per-test significance level based on user inputs of the number of events per year, number of constituents being evaluated, and number of compliance wells. For the April 2023 event, the following values were used:

Parameter	Value	Comments
Evaluations per year	2	Spring and Fall events
Constituents analyzed	7	Appendix III parameters
Compliance wells	3	MW-301, MW-302, MW-303

Non-parametric prediction limits are also based on a 1-of-2 retesting protocol. The non-parametric limit is the highest value in the background dataset. Due to the small sample size, the false positive rate for the non-parametric tests is higher than for the parametric tests, but will go down as more background data are obtained.

For results with 100 percent non-detects in the background data, evaluation under the Double Quantification Rule means that a statistically significant increase (SSI) has not occurred for a compliance well unless two sample results from the well exceed the laboratory's reporting limit or

quanitification limit. For the current background dataset, none of the Appendix III parameters had 100 percent non-detects, so the Double Quantification rule was not applied.

For evaluation of parameters with less than 100 percent non-detects in the background sampling, the non-detects were adjusted using the Kaplan-Meier technique, unless the non-detects represent less than 15 percent of the total samples, in which case one-half of the detection limit was used.

Interwell prediction limit analysis results are included in **Attachment 4**.

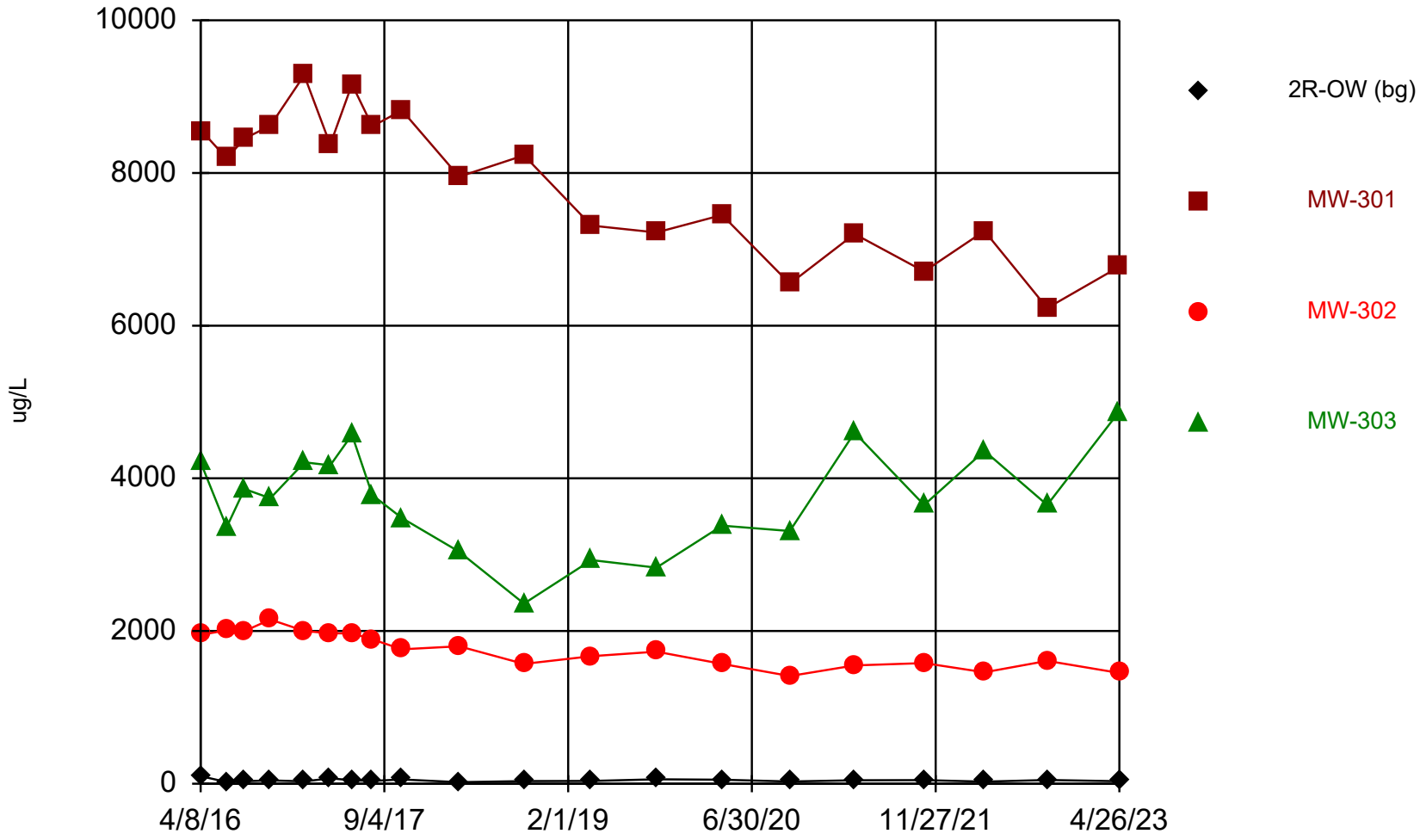
RM/SCC

I:\25223068.00\Data and Calculations\Sanitas\EDG Closed CCR Stats Memo\Edg Closed CCR Stats Memo.docx

Attachment 1

Times Series Graphs

Boron



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

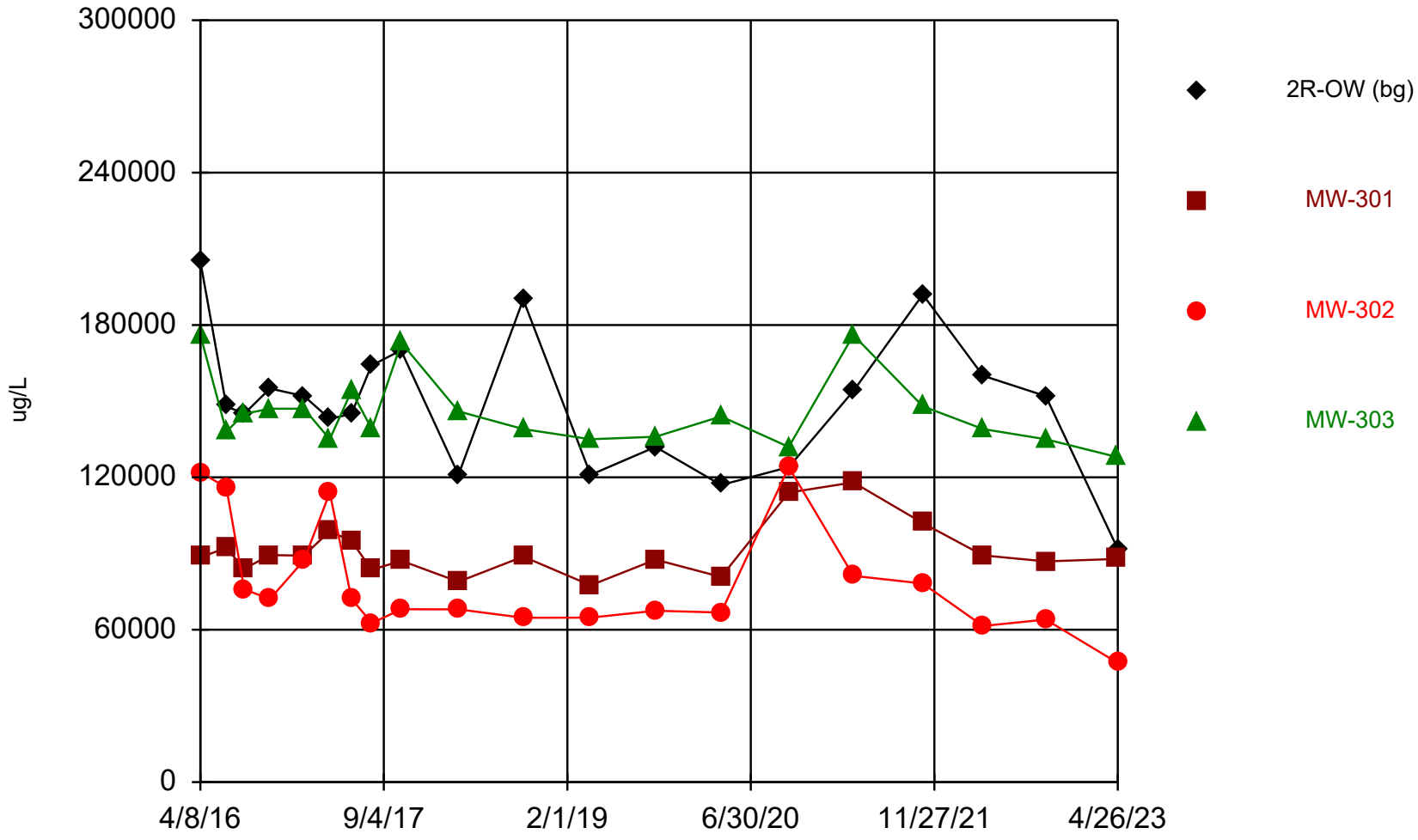
Time Series

Constituent: Boron (ug/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	100		1950	4210
4/11/2016		8550		
6/20/2016	22.4	8190	2010	3360
8/9/2016	32.6	8450	2000	3860
10/20/2016	43.1	8620	2150	3740
1/23/2017		9280		
1/24/2017	31.2		2000	4210
4/6/2017	70.6	8370	1970	4170
6/6/2017	45.2	9160	1970	4570
8/1/2017	35.7			
8/2/2017		8610	1890	3780
10/23/2017	55.9			
10/24/2017		8820	1760	3480
4/2/2018	19.7	7950	1800	3040
10/1/2018	34.7	8230	1570	2360
4/8/2019	35.8	7310	1670	2930
10/7/2019	58.8	7220	1730	2830
4/8/2020	52.3	7450	1570	3380
10/15/2020	29.9	6550	1410	3310
4/14/2021	45.7	7200	1550	4600
10/26/2021	47.2	6710	1580	3650
4/13/2022	27.9	7240	1460	4360
10/6/2022	49	6230	1610	3650
4/25/2023		6770		4870
4/26/2023	32		1450	

Calcium



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

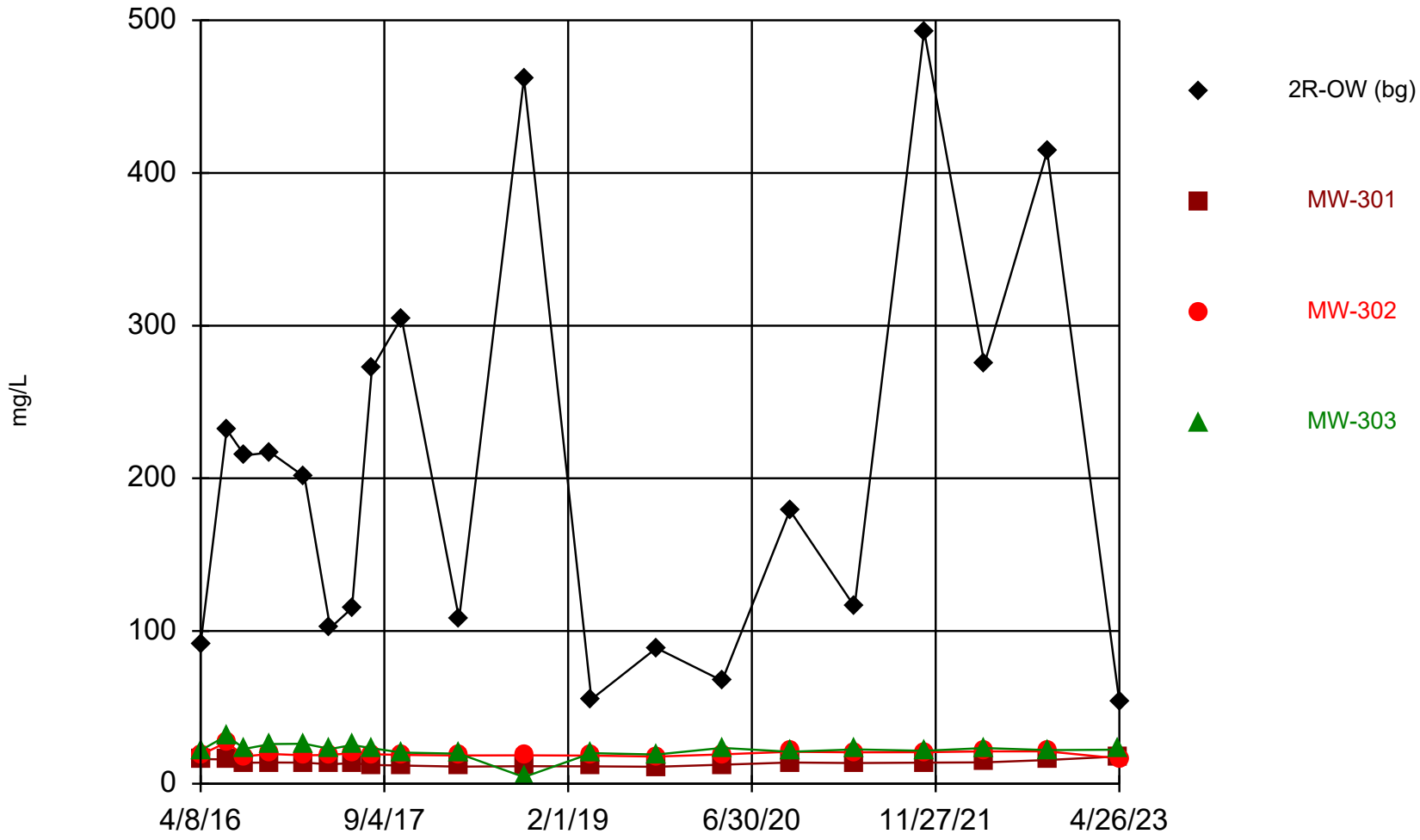
Time Series

Constituent: Calcium (ug/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	205000		122000	176000
4/11/2016		88700		
6/20/2016	148000	92200	116000	138000
8/9/2016	145000	84000	75900	145000
10/20/2016	155000	89400	72100	147000
1/23/2017		89200		
1/24/2017	152000		87400	147000
4/6/2017	143000	98800	114000	135000
6/6/2017	145000	94900	72200	154000
8/1/2017	164000			
8/2/2017		83600	62600	139000
10/23/2017	170000			
10/24/2017		87200	68100	173000
4/2/2018	121000	78900	68000	146000
10/1/2018	190000	88800	64700	139000
4/8/2019	121000	77500	64800	135000
10/7/2019	132000	87600	67500	136000
4/8/2020	117000	80800	66800	144000
10/15/2020	124000	114000	124000	132000
4/14/2021	154000	118000	81200	176000
10/26/2021	192000	102000	78200	148000
4/13/2022	160000	89300	61500	139000
10/6/2022	152000	86900	64000	135000
4/25/2023		87900		128000
4/26/2023	91800		46900	

Chloride



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

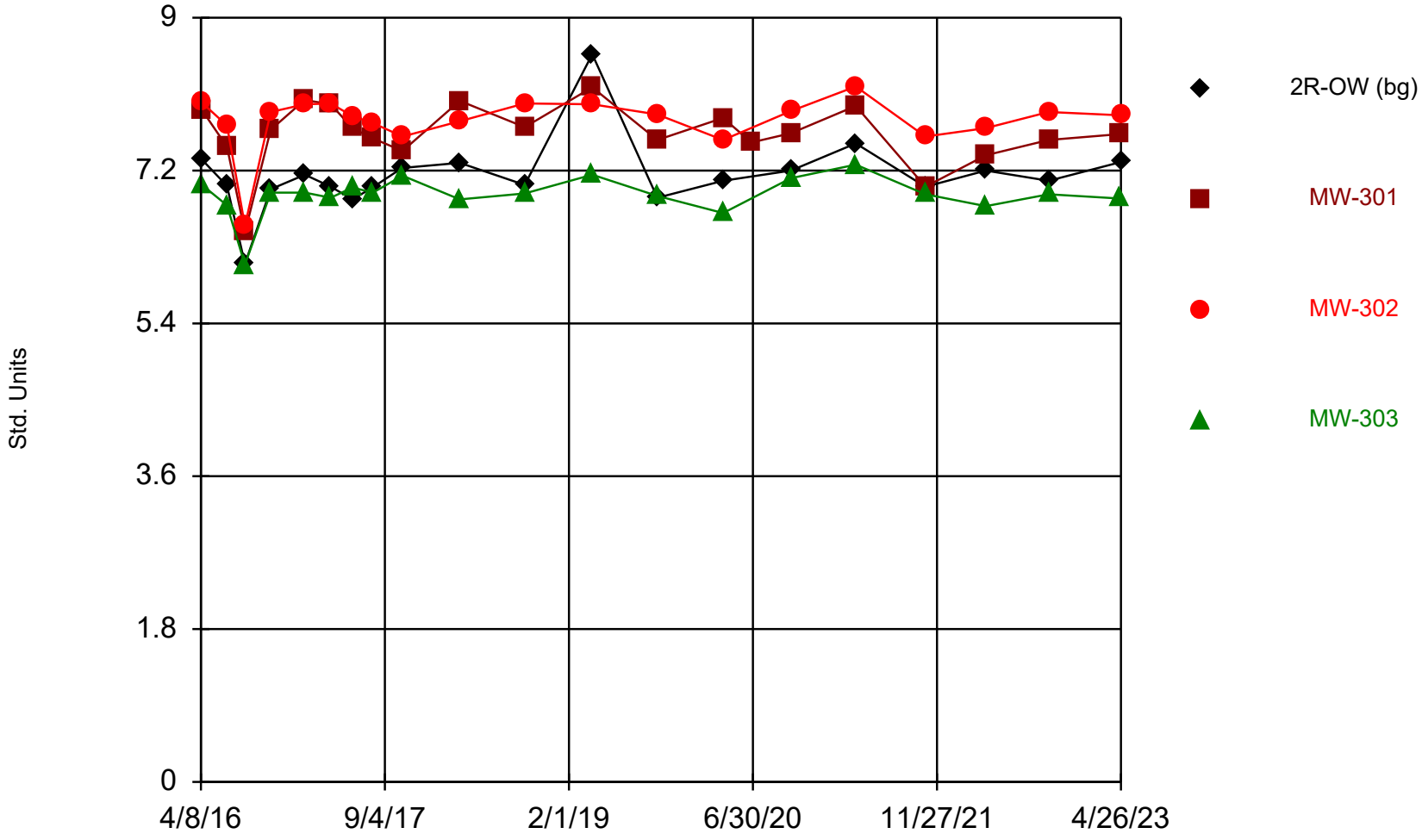
Time Series

Constituent: Chloride (mg/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	91.7		18.9	21.8
4/11/2016		16.2		
6/20/2016	232	15.9	27.2	31.5
8/9/2016	215	13.7	18	22.8
10/20/2016	217	13.9	19.5	26
1/23/2017		13.8		
1/24/2017	201		18.6	26.2
4/6/2017	102	12.7	18.9	22.7
6/6/2017	115	13.5	20	25.4
8/1/2017	272			
8/2/2017		12.3	19.3	23.2
10/23/2017	305			
10/24/2017		11.9	18.9	20.4
4/2/2018	108	11.2	18.5	19.7
10/1/2018	462	11.5	18.6	4.3
4/8/2019	55.3	11.4	18.4	20
10/7/2019	88.8	11.1	17.8	19.1
4/8/2020	67.5	12.5	19.2	23.5
10/15/2020	179	13.9	20.9	20.9
4/14/2021	116	13.5	20.6	22.5
10/26/2021	493	13.8	20.7	21.6
4/13/2022	275	14	21.2	23.4
10/6/2022	414	15.5	21.2	22
4/25/2023		17.9		22.3
4/26/2023	53.4		16.5	

Field pH



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

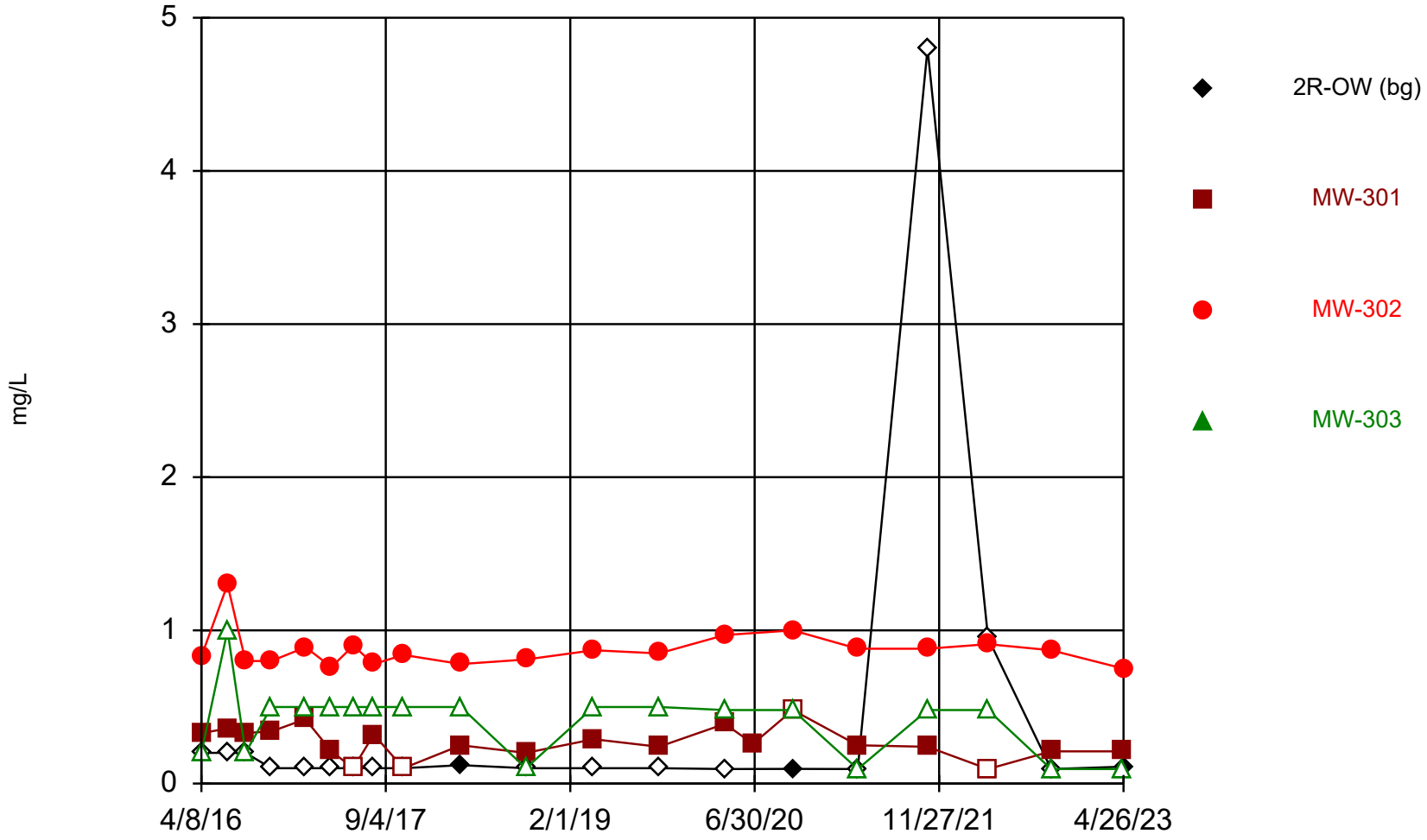
Constituent: Field pH (Std. Units) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	7.34		8.01	7.04
4/11/2016		7.91		
6/20/2016	7.02	7.48	7.73	6.79
8/9/2016	6.1 (X)	6.47	6.55	6.09
10/20/2016	6.98	7.68	7.89	6.94
1/23/2017		8.03		
1/24/2017	7.15		7.98	6.94
4/6/2017	7.01	7.98	7.99	6.88
6/6/2017	6.86	7.7	7.84	7
8/1/2017	7			
8/2/2017		7.58	7.76	6.94
10/23/2017	7.23			
10/24/2017		7.43	7.6	7.14
4/2/2018	7.29	8.02	7.78	6.86
10/1/2018	7.03	7.71	7.99	6.93
4/8/2019	8.57	8.18	7.98	7.15
10/7/2019	6.88	7.56	7.86	6.9
4/8/2020	7.08	7.82	7.56	6.7
6/26/2020		7.53		
10/15/2020	7.2	7.64	7.9	7.11
4/14/2021	7.52	7.96	8.19	7.27
10/26/2021	7.01	7.01	7.6	6.92
4/13/2022	7.2	7.38	7.7	6.78
10/6/2022	7.08	7.56	7.89	6.92
4/25/2023		7.63		6.87
4/26/2023	7.3		7.85	

Hollow symbols indicate censored values.

Fluoride



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Fluoride (mg/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

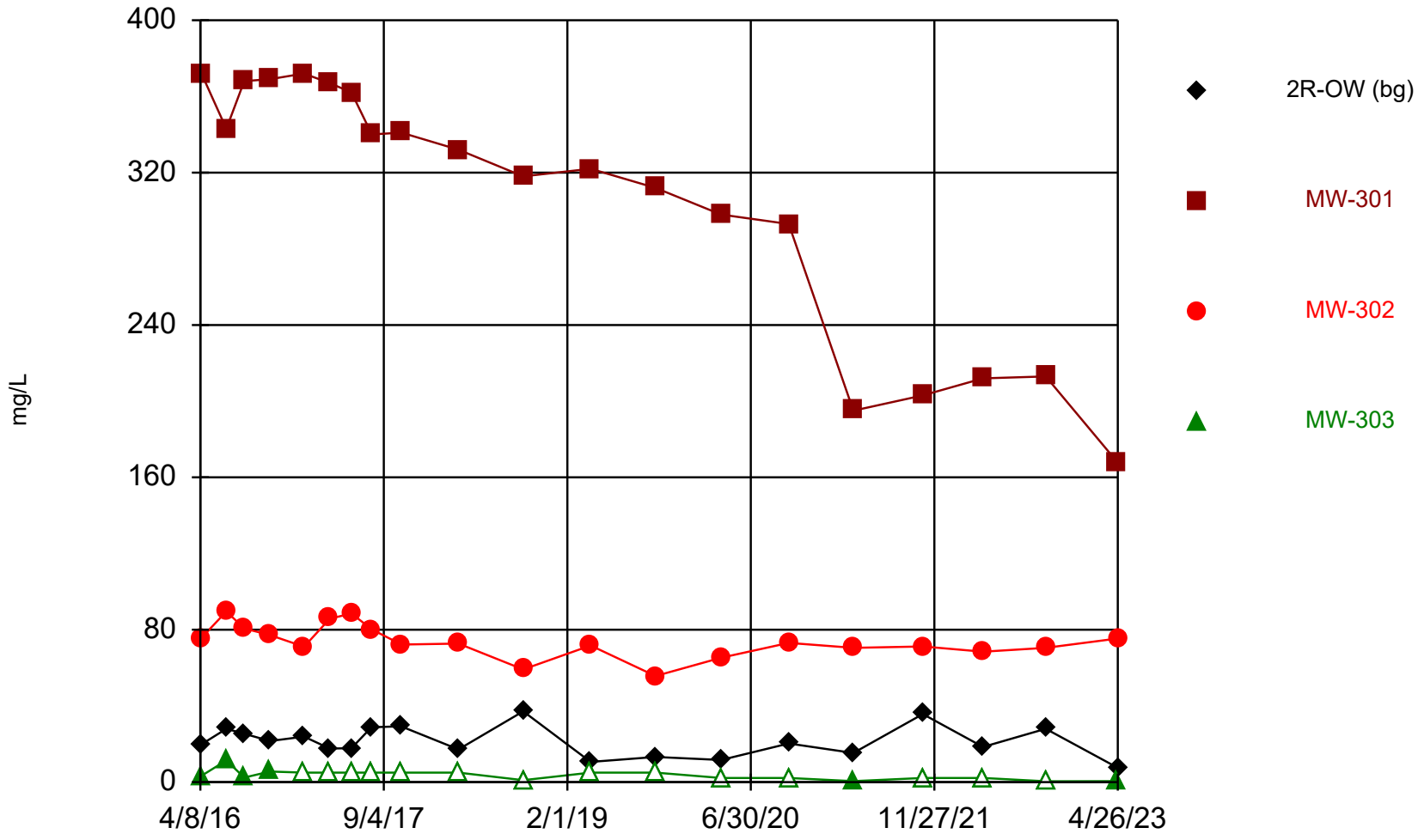
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	<0.2 (U)		0.83	<0.2 (U)
4/11/2016		0.33 (J)		
6/20/2016	<0.2 (U)	0.36 (J)	1.3 (J)	<1 (U)
8/9/2016	<0.2 (U)	0.33 (J)	0.8	<0.2 (U)
10/20/2016	<0.1 (U)	0.34	0.8	<0.5 (U)
1/23/2017		0.42		
1/24/2017	<0.1 (U)		0.89 (J)	<0.5 (U)
4/6/2017	<0.1 (U)	0.21 (J)	0.76	<0.5 (U)
6/6/2017	<0.1 (U)	<0.1 (U)	0.9	<0.5 (U)
8/1/2017	<0.1 (U)			
8/2/2017		0.32	0.78	<0.5 (U)
10/23/2017	<0.1 (U)			
10/24/2017		<0.1 (U)	0.84	<0.5 (U)
4/2/2018	0.12 (J)	0.25 (J)	0.78	<0.5 (U)
10/1/2018	<0.1 (U)	0.2 (J)	0.81	<0.1 (U)
4/8/2019	<0.1 (U)	0.29 (J)	0.87	<0.5 (U)
10/7/2019	<0.1 (U)	0.24 (J)	0.85	<0.5 (U)
4/8/2020	<0.095 (U)	0.39	0.97	<0.48 (U)
6/26/2020		0.26 (J)		
10/15/2020	0.096 (J)	<0.48 (U)	1 (J)	<0.48 (U)
4/14/2021	<0.095 (U)	0.25 (J)	0.88	<0.095
10/26/2021	<4.8 (U)	0.24 (J)	0.88	<0.48
4/13/2022	<0.95 (U)	<0.095 (U)	0.91	<0.48 (U)
10/6/2022	<0.095 (U)	0.21 (J)	0.87	<0.095 (U)
4/25/2023		0.21 (J)		<0.095 (U)
4/26/2023	0.11 (J)		0.75	

ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Sulfate



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

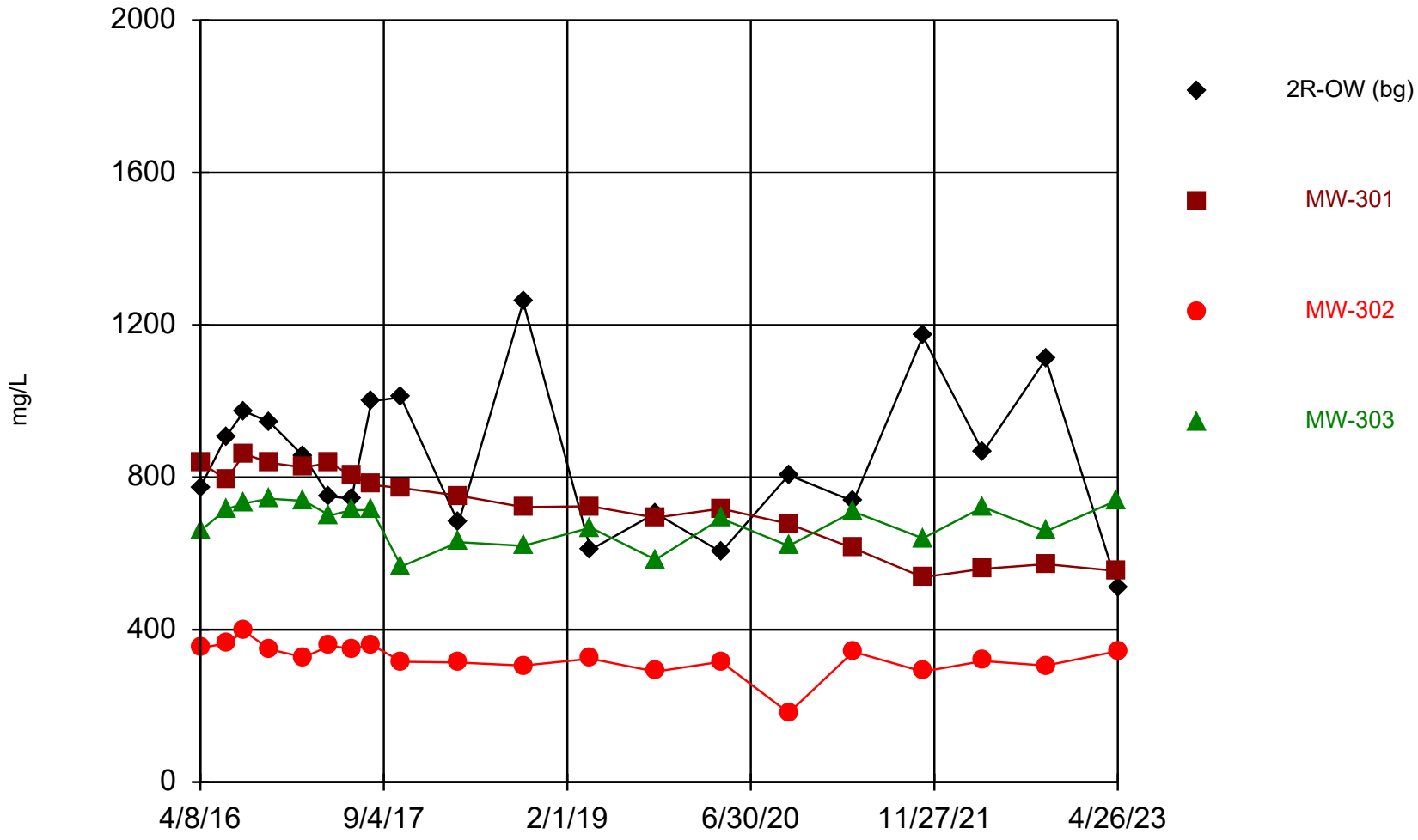
Constituent: Sulfate (mg/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	19.5		75.1	3 (J)
4/11/2016		372		
6/20/2016	28	343	89.6	11.4 (J)
8/9/2016	25.4	368	80.7	2.4 (J)
10/20/2016	21.6	369	77.2	5.6 (J)
1/23/2017		372		
1/24/2017	23.9		71.1	<5 (U)
4/6/2017	17.6	367	85.8	<5 (U)
6/6/2017	17.8	362	88.5	<5 (U)
8/1/2017	28.8			
8/2/2017		340	80.2	<5 (U)
10/23/2017	29.3			
10/24/2017		341	72.2	<5 (U)
4/2/2018	17.2	332	72.7	<5 (U)
10/1/2018	37.2	318	59.2	<1 (U)
4/8/2019	10.6	322	71.7	<5 (U)
10/7/2019	13.2	312	55.7	<5 (U)
4/8/2020	11.6	298	65.3	<2.2 (U)
10/15/2020	20.3	293	73.1	<2.2 (U)
4/14/2021	15.3	195	70.5	0.54 (J)
10/26/2021	35.7 (J)	203	71.2	<2.2 (U)
4/13/2022	18.5 (J)	212	68.5	<2.2 (U)
10/6/2022	28	213	70.5	<0.44 (U)
4/25/2023		168		0.5 (J)
4/26/2023	7.5		75.4	

ND substitution: RL or RL/2 if <15% NDs.

Total Dissolved Solids



Time Series Analysis Run 7/28/2023 9:17 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 7/28/2023 9:18 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-301	MW-302	MW-303
4/8/2016	774		352	660
4/11/2016		838		
6/20/2016	908	794	364	716
8/9/2016	974	862	396	732
10/20/2016	944	838	348	744
1/23/2017		826		
1/24/2017	854		328	738
4/6/2017	750	838	358	700
6/6/2017	744	804	350	714
8/1/2017	1000			
8/2/2017		780	360	714
10/23/2017	1010			
10/24/2017		772	316	566
4/2/2018	680	752	314	630
10/1/2018	1260	722	306	620
4/8/2019	610	724	324	668
10/7/2019	706	694	290	584
4/8/2020	604	718	316	692
10/15/2020	806	678	182	620
4/14/2021	737	614	342	710
10/26/2021	1170	538	290	640
4/13/2022	866	560	318	722
10/6/2022	1110	572	306	658
4/25/2023		554		740
4/26/2023	512		344	

Attachment 2

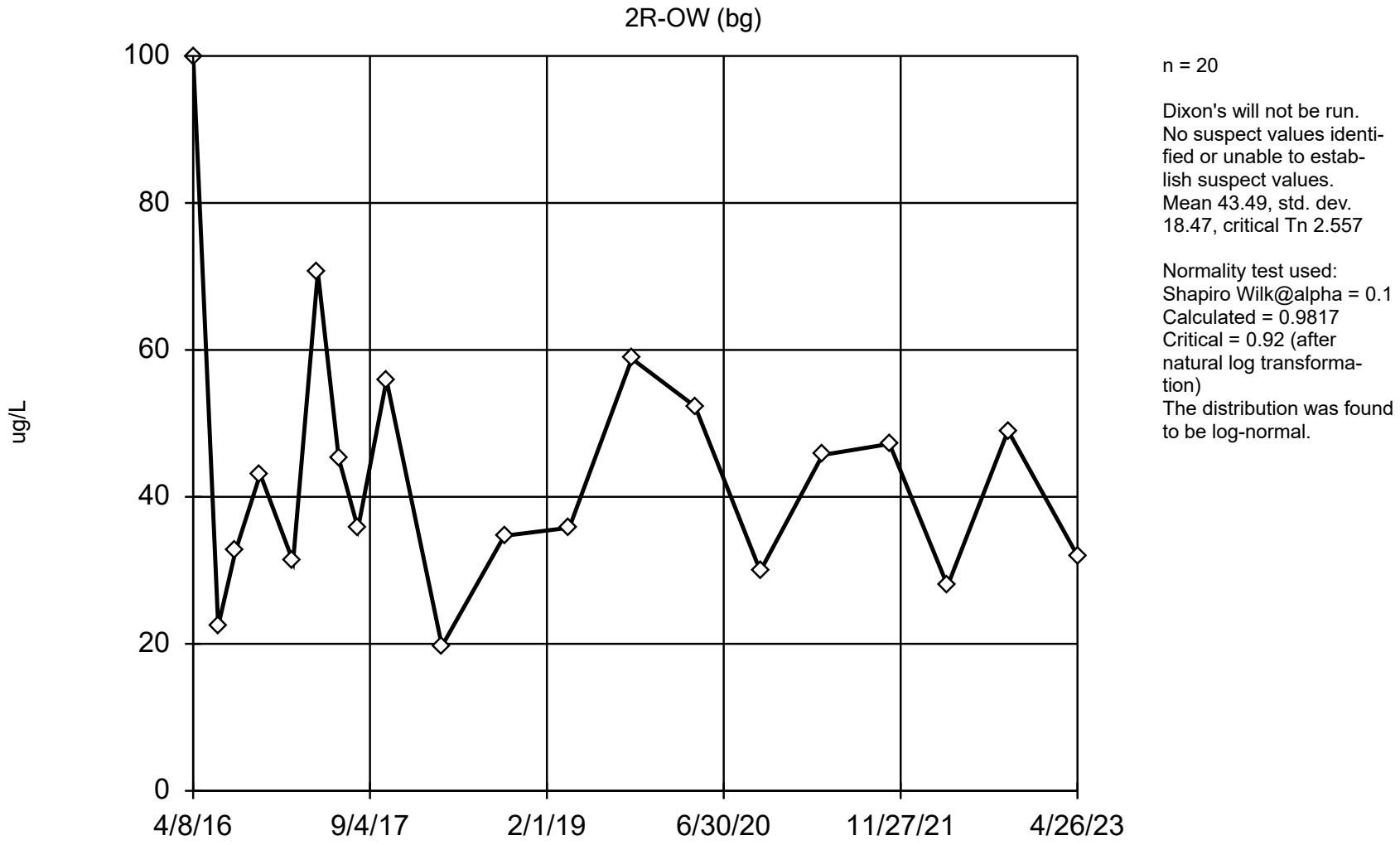
Outlier Analysis

Outlier Analysis

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 7/28/2023, 9:32 AM

Constituent	Well	Outlier	Value(s)	Date(s)	Method	Alpha	N	Mean	Std. Dev.	Distribution	Normality Test
Boron (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	20	43.49	18.47	ln(x)	ShapiroWilk
Calcium (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	20	149090	27509	normal	ShapiroWilk
Chloride (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	20	203.1	133.8	ln(x)	ShapiroWilk
Field pH (Std. Units)	**2R-OW (bg)**	**Yes**	**8.57,6.1**	**4/8/2019,...**	**Dixon`s**	**0.05**	**20**	**7.143**	**0.4373**	**normal**	**ShapiroWilk**
Fluoride (mg/L)	**2R-OW (bg)**	**Yes**	**4.8,0.95**	**10/26/202...**	**NP (nrm)**	**NaN**	**20**	**0.3931**	**1.054**	**unknown**	**ShapiroWilk**
Sulfate (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	20	21.35	8.109	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	20	851	197	normal	ShapiroWilk

EPA Screening (suspected outliers for Dixon's Test)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 43.49, std. dev. 18.47, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9817
Critical = 0.92 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Boron Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

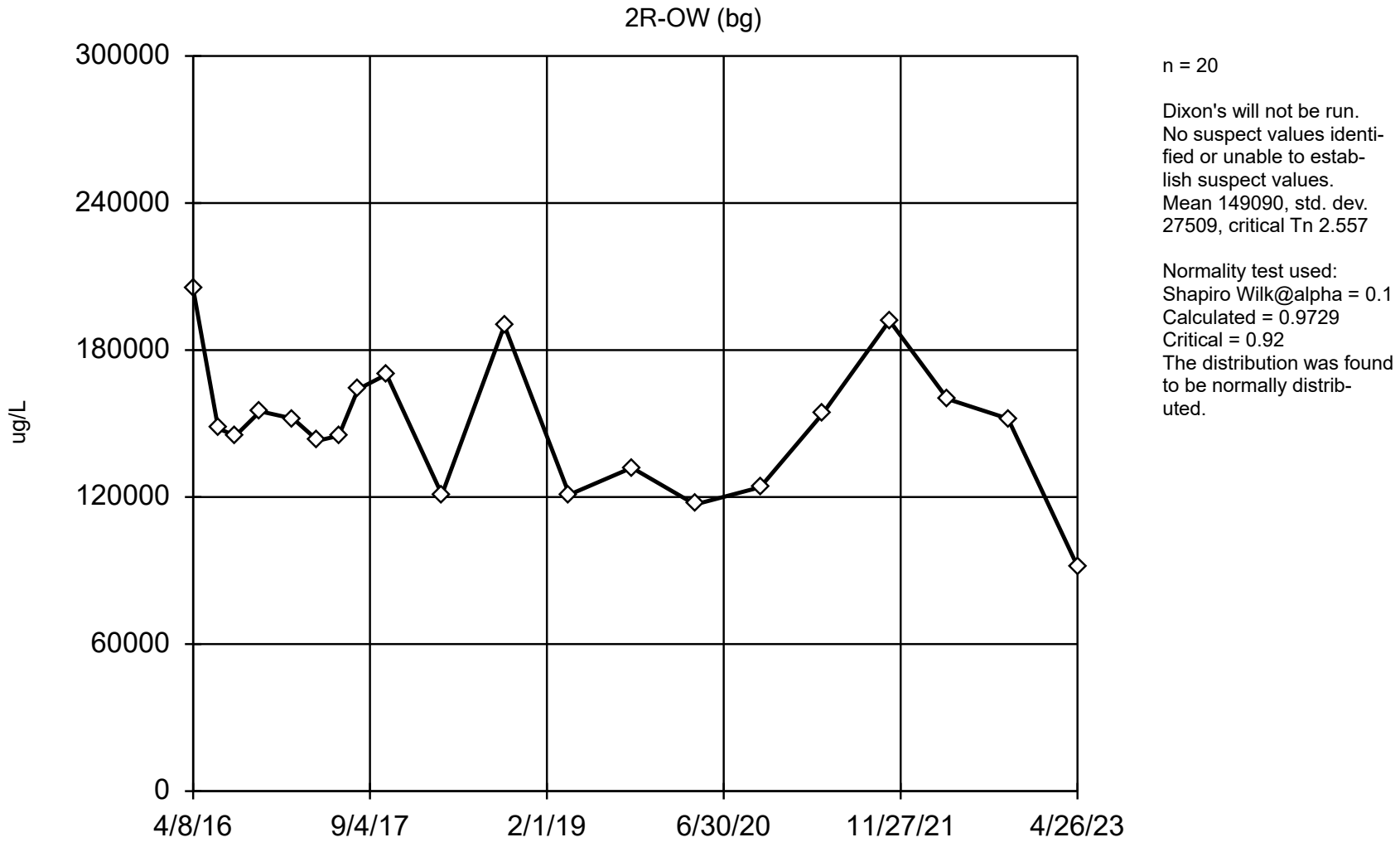
EPA 1989 Outlier Screening

Constituent: Boron (ug/L) Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	100
6/20/2016	22.4
8/9/2016	32.6
10/20/2016	43.1
1/24/2017	31.2
4/6/2017	70.6
6/6/2017	45.2
8/1/2017	35.7
10/23/2017	55.9
4/2/2018	19.7
10/1/2018	34.7
4/8/2019	35.8
10/7/2019	58.8
4/8/2020	52.3
10/15/2020	29.9
4/14/2021	45.7
10/26/2021	47.2
4/13/2022	27.9
10/6/2022	49
4/26/2023	32

EPA Screening (suspected outliers for Dixon's Test)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 149090, std. dev. 27509, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9729
Critical = 0.92
The distribution was found to be normally distributed.

Constituent: Calcium Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

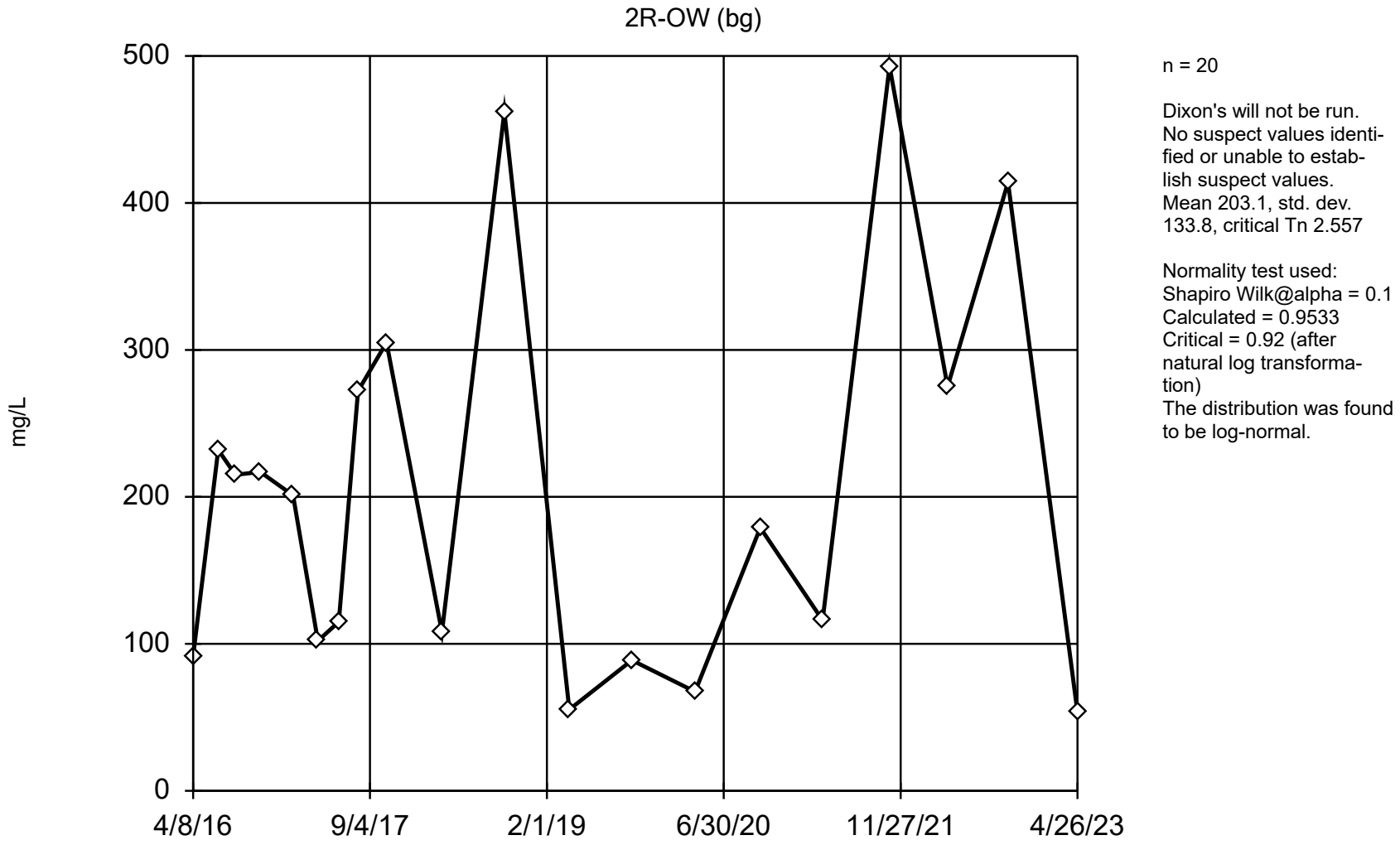
EPA 1989 Outlier Screening

Constituent: Calcium (ug/L) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	205000
6/20/2016	148000
8/9/2016	145000
10/20/2016	155000
1/24/2017	152000
4/6/2017	143000
6/6/2017	145000
8/1/2017	164000
10/23/2017	170000
4/2/2018	121000
10/1/2018	190000
4/8/2019	121000
10/7/2019	132000
4/8/2020	117000
10/15/2020	124000
4/14/2021	154000
10/26/2021	192000
4/13/2022	160000
10/6/2022	152000
4/26/2023	91800

EPA Screening (suspected outliers for Dixon's Test)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 203.1, std. dev. 133.8, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9533
Critical = 0.92 (after natural log transformation)
The distribution was found to be log-normal.

Constituent: Chloride Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

EPA 1989 Outlier Screening

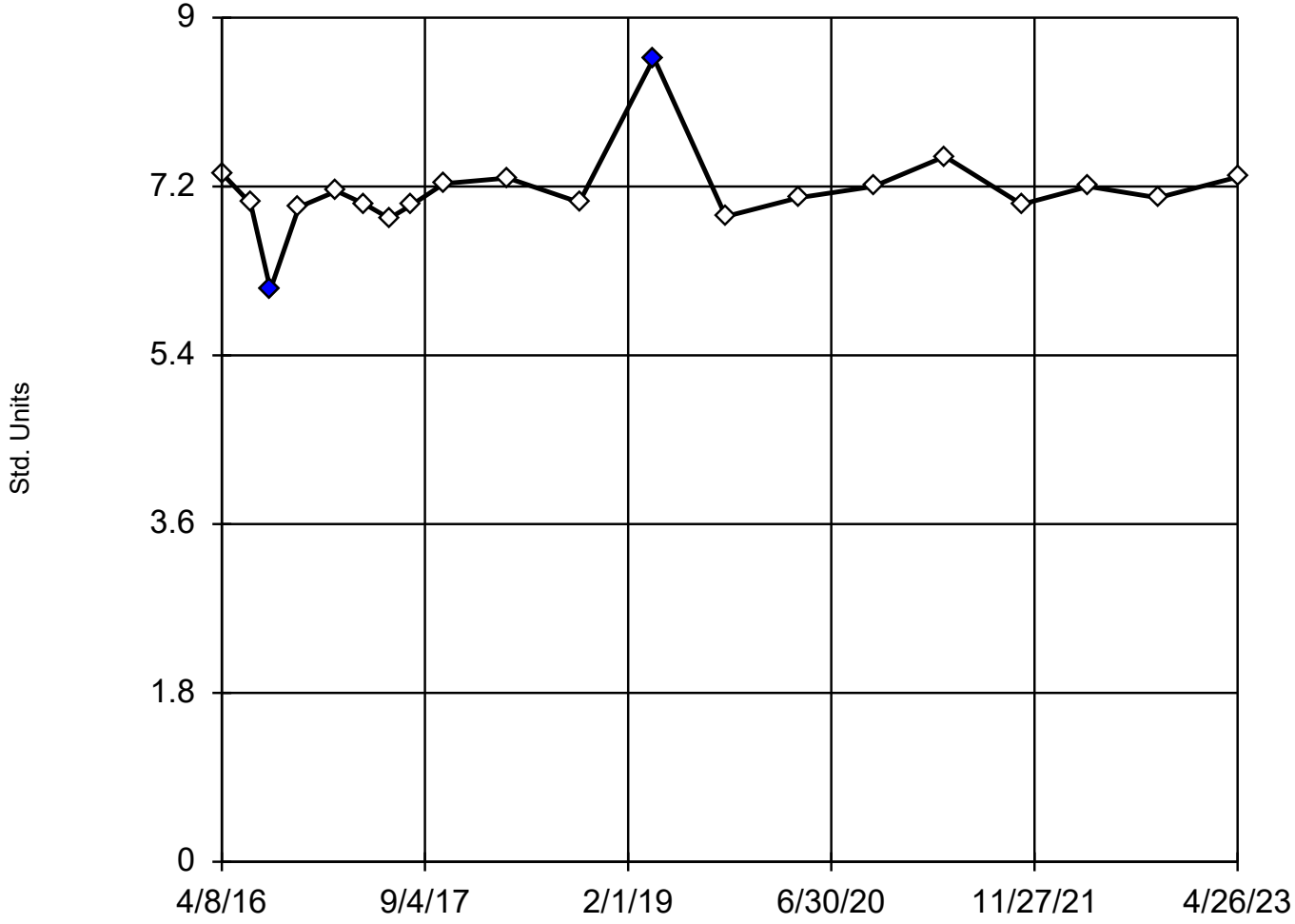
Constituent: Chloride (mg/L) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	91.7
6/20/2016	232
8/9/2016	215
10/20/2016	217
1/24/2017	201
4/6/2017	102
6/6/2017	115
8/1/2017	272
10/23/2017	305
4/2/2018	108
10/1/2018	462
4/8/2019	55.3
10/7/2019	88.8
4/8/2020	67.5
10/15/2020	179
4/14/2021	116
10/26/2021	493
4/13/2022	275
10/6/2022	414
4/26/2023	53.4

Dixon's Outlier Test

2R-OW (bg)



n = 20

Statistical outliers are drawn as solid.
Testing for 1 high and 1 low outliers.
Mean = 7.143.
Std. Dev. = 0.4373.
8.57: c = 0.7278
tabl = 0.45.
6.1 (X): c = 0.629
tabl = 0.45.
Alpha = 0.05.

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9554
Critical = 0.914
The distribution, after removal of suspect values, was found to be normally distributed.

Constituent: Field pH Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

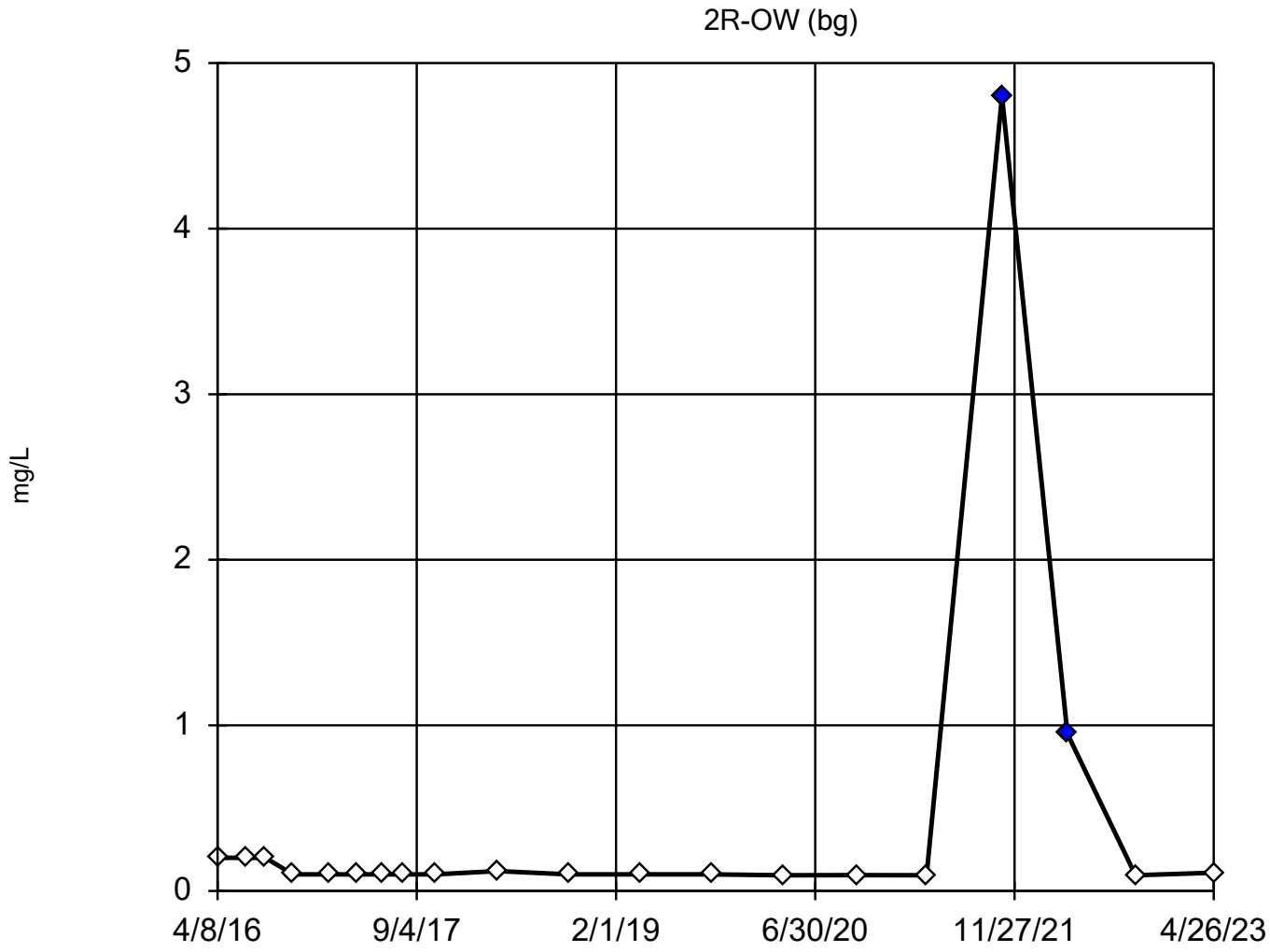
Dixon's Outlier Test

Constituent: Field pH (Std. Units) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	7.34
6/20/2016	7.02
8/9/2016	6.1 (XO)
10/20/2016	6.98
1/24/2017	7.15
4/6/2017	7.01
6/6/2017	6.86
8/1/2017	7
10/23/2017	7.23
4/2/2018	7.29
10/1/2018	7.03
4/8/2019	8.57 (O)
10/7/2019	6.88
4/8/2020	7.08
10/15/2020	7.2
4/14/2021	7.52
10/26/2021	7.01
4/13/2022	7.2
10/6/2022	7.08
4/26/2023	7.3

Tukey's Outlier Screening



n = 20

Outliers are drawn as solid.
Tukey's method used in lieu of parametric test because the Shapiro Wilk normality test failed at the 0.1 alpha level.

Data were natural log transformed to achieve best W statistic (graph shown in original units).

High cutoff = 0.576, low cutoff = 0.0269, based on IQR multiplier of 3.

Constituent: Fluoride Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Tukey's Outlier Screening

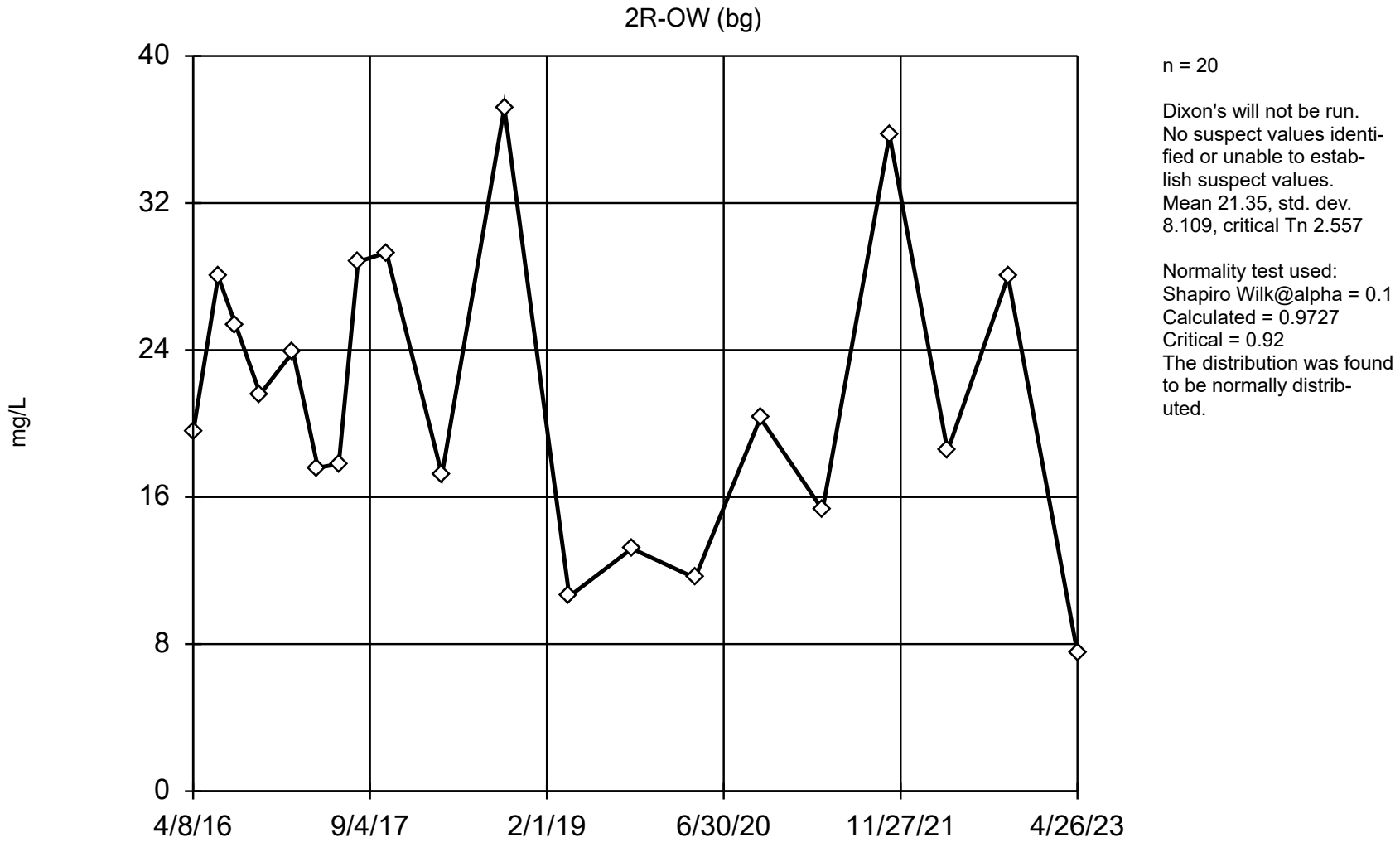
Constituent: Fluoride (mg/L) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	<0.2 (U)
6/20/2016	<0.2 (U)
8/9/2016	<0.2 (U)
10/20/2016	<0.1 (U)
1/24/2017	<0.1 (U)
4/6/2017	<0.1 (U)
6/6/2017	<0.1 (U)
8/1/2017	<0.1 (U)
10/23/2017	<0.1 (U)
4/2/2018	0.12 (J)
10/1/2018	<0.1 (U)
4/8/2019	<0.1 (U)
10/7/2019	<0.1 (U)
4/8/2020	<0.095 (U)
10/15/2020	0.096 (J)
4/14/2021	<0.095 (U)
10/26/2021	<4.8 (UXO)
4/13/2022	<0.95 (UXO)
10/6/2022	<0.095 (U)
4/26/2023	0.11 (J)

ND substitution: RL or RL/2 if <15% NDs.

EPA Screening (suspected outliers for Dixon's Test)



Constituent: Sulfate Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

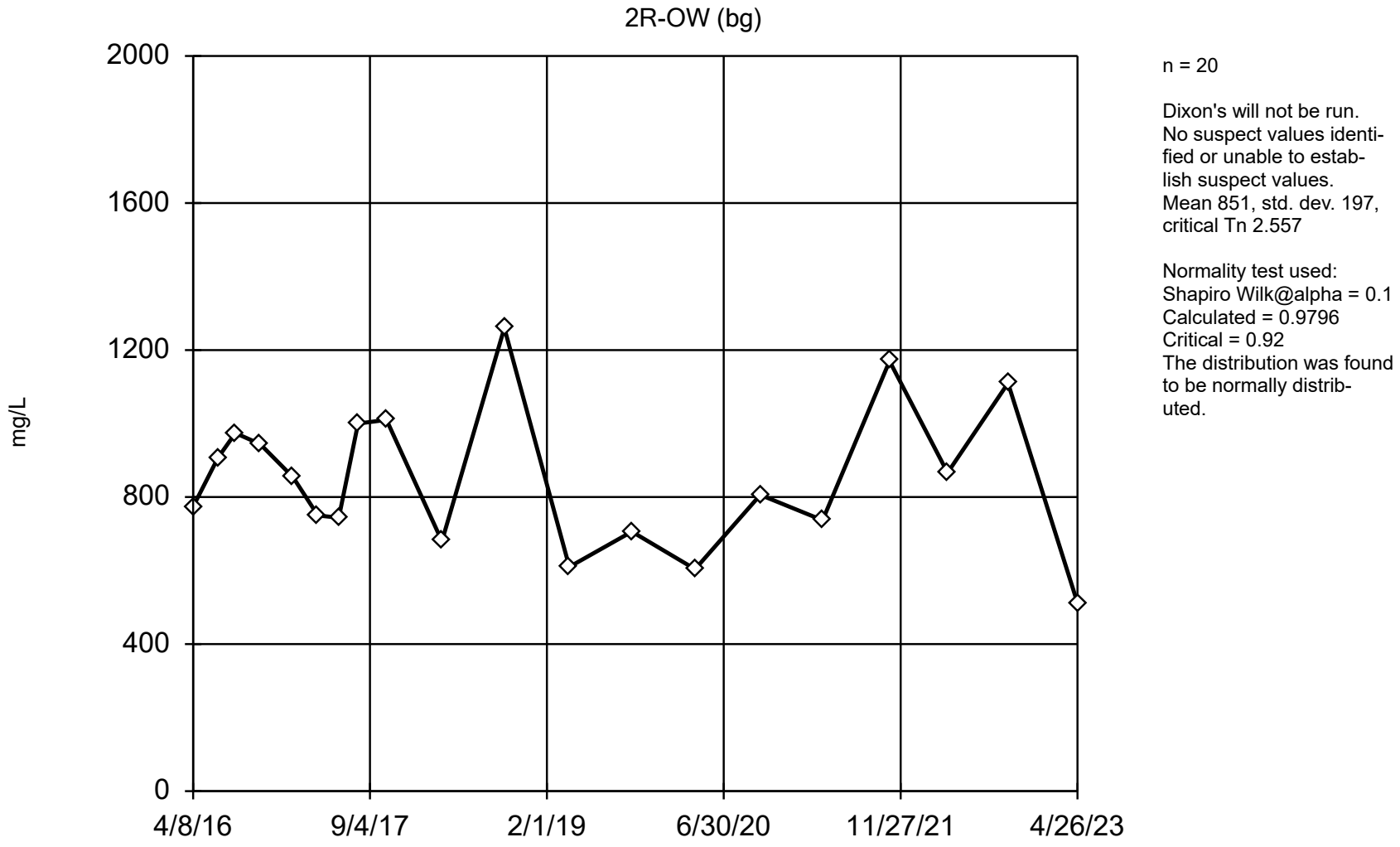
EPA 1989 Outlier Screening

Constituent: Sulfate (mg/L) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	19.5
6/20/2016	28
8/9/2016	25.4
10/20/2016	21.6
1/24/2017	23.9
4/6/2017	17.6
6/6/2017	17.8
8/1/2017	28.8
10/23/2017	29.3
4/2/2018	17.2
10/1/2018	37.2
4/8/2019	10.6
10/7/2019	13.2
4/8/2020	11.6
10/15/2020	20.3
4/14/2021	15.3
10/26/2021	35.7 (J)
4/13/2022	18.5 (J)
10/6/2022	28
4/26/2023	7.5

EPA Screening (suspected outliers for Dixon's Test)



n = 20

Dixon's will not be run.
No suspect values identified or unable to establish suspect values.
Mean 851, std. dev. 197, critical Tn 2.557

Normality test used:
Shapiro Wilk@alpha = 0.1
Calculated = 0.9796
Critical = 0.92
The distribution was found to be normally distributed.

Constituent: Total Dissolved Solids Analysis Run 7/28/2023 9:32 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

EPA 1989 Outlier Screening

Constituent: Total Dissolved Solids (mg/L) Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)
4/8/2016	774
6/20/2016	908
8/9/2016	974
10/20/2016	944
1/24/2017	854
4/6/2017	750
6/6/2017	744
8/1/2017	1000
10/23/2017	1010
4/2/2018	680
10/1/2018	1260
4/8/2019	610
10/7/2019	706
4/8/2020	604
10/15/2020	806
4/14/2021	737
10/26/2021	1170
4/13/2022	866
10/6/2022	1110
4/26/2023	512

Attachment 3

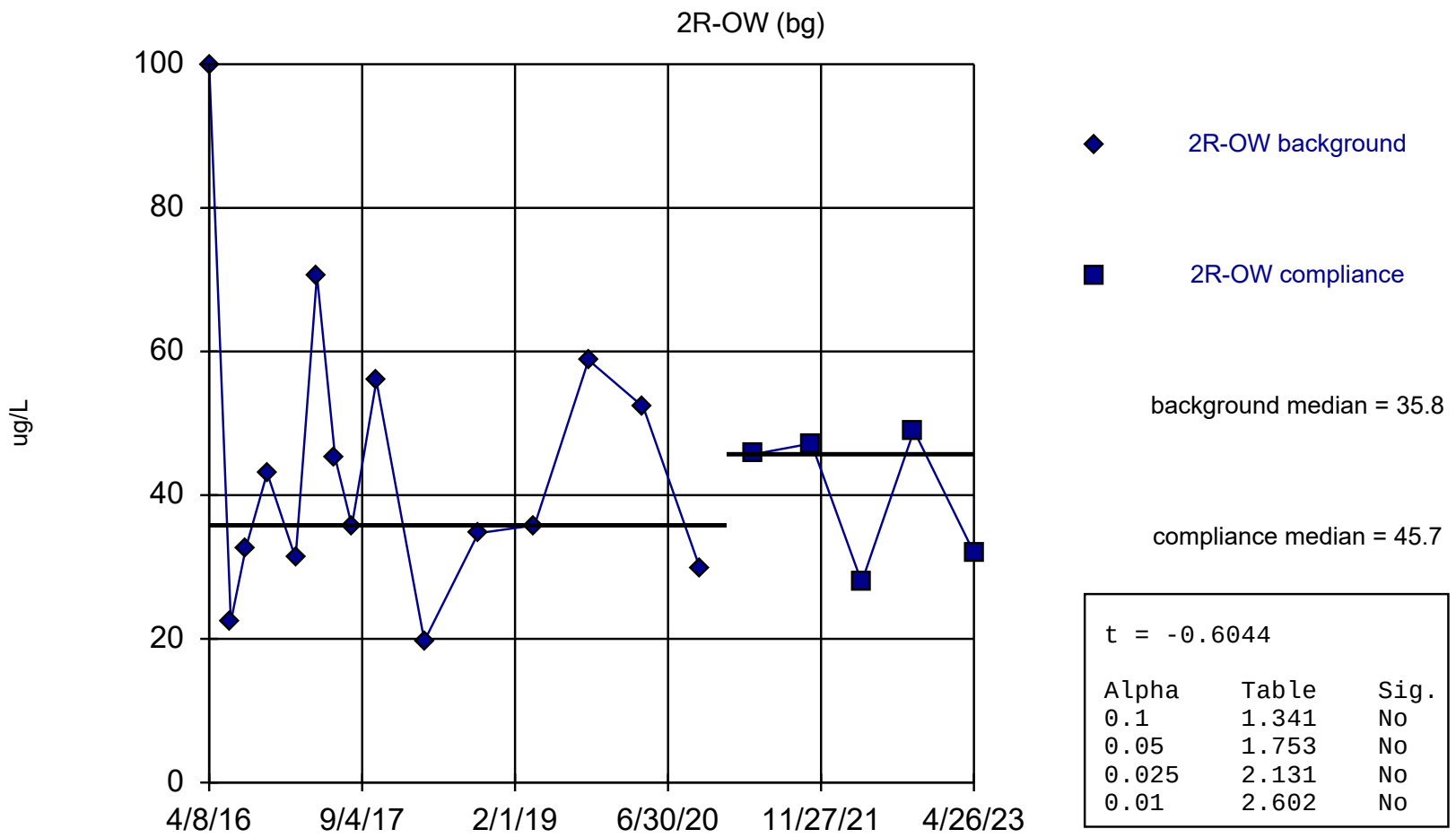
Welch’s/Mann-Whitney Comparison

Welch's t-test/Mann-Whitney

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 7/28/2023, 9:36 AM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Alpha	Sig.	Bg. Wells	Method
Boron (ug/L)	2R-OW (bg)	-0.6044	No	No	No	No	0.01	No	(intrawell)	Welch`s
Calcium (ug/L)	2R-OW (bg)	0.06621	No	No	No	No	0.01	No	(intrawell)	Welch`s
Chloride (mg/L)	2R-OW (bg)	1.01	No	No	No	No	0.01	No	(intrawell)	Welch`s
Field pH (Std. Units)	2R-OW (bg)	1.18	No	No	No	No	0.01	No	(intrawell)	Mann-W (normality)
Fluoride (mg/L)	2R-OW (bg)	0.3673	No	No	No	No	0.01	No	(intrawell)	Mann-W (NDs)
Sulfate (mg/L)	2R-OW (bg)	-0.0883	No	No	No	No	0.01	No	(intrawell)	Welch`s
Total Dissolved Solids (mg/L)	2R-OW (bg)	0.289	No	No	No	No	0.01	No	(intrawell)	Welch`s

Welch's t-test




```
t = -0.6044

Alpha     Table     Sig.
0.1       1.341     No
0.05      1.753     No
0.025     2.131     No
0.01      2.602     No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8829, critical = 0.881.

Constituent: Boron Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

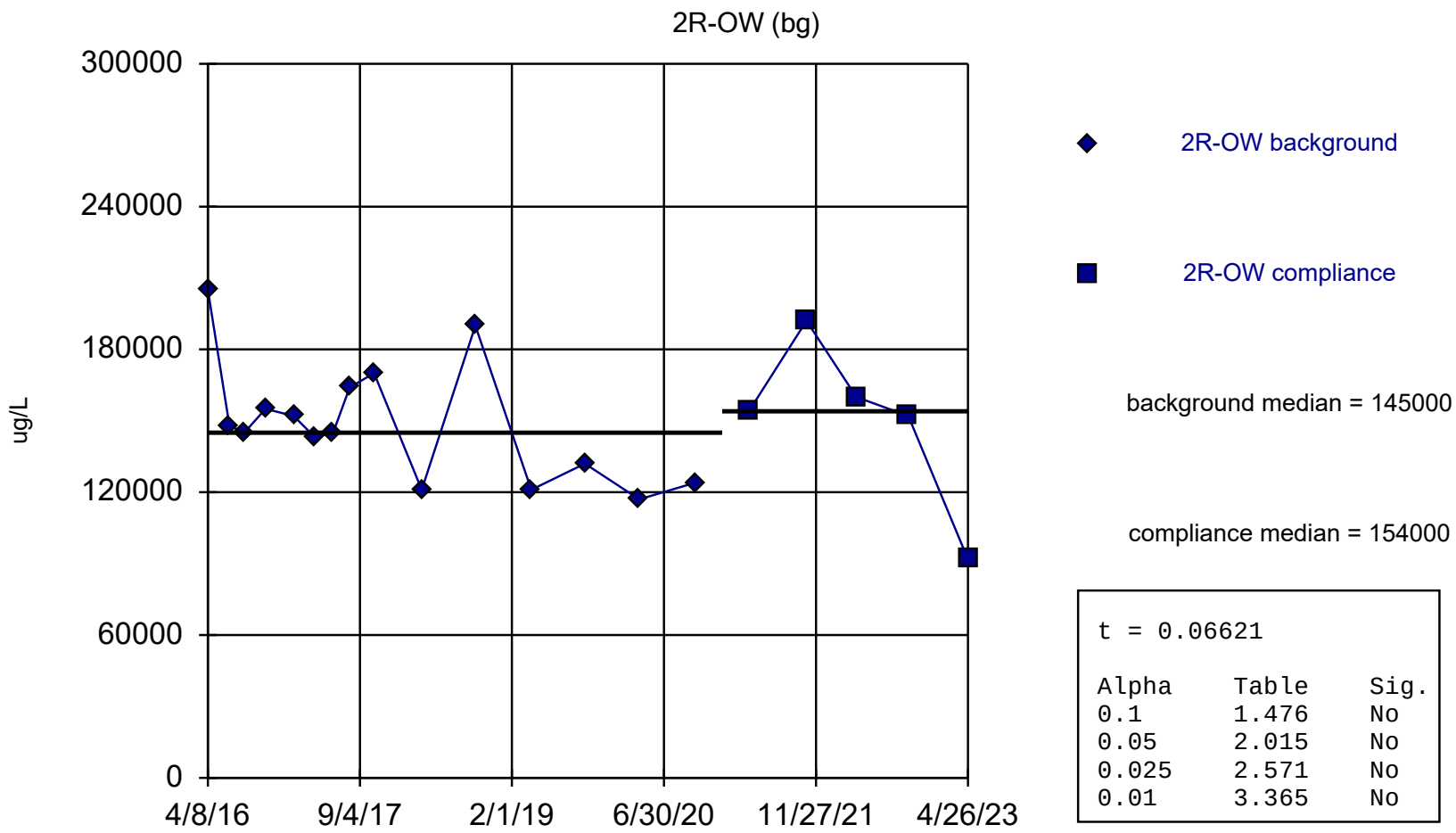
Welch's t-test

Constituent: Boron (ug/L) Analysis Run 7/28/2023 9:36 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	100	
6/20/2016	22.4	
8/9/2016	32.6	
10/20/2016	43.1	
1/24/2017	31.2	
4/6/2017	70.6	
6/6/2017	45.2	
8/1/2017	35.7	
10/23/2017	55.9	
4/2/2018	19.7	
10/1/2018	34.7	
4/8/2019	35.8	
10/7/2019	58.8	
4/8/2020	52.3	
10/15/2020	29.9	
4/14/2021		45.7
10/26/2021		47.2
4/13/2022		27.9
10/6/2022		49
4/26/2023		32

Welch's t-test



t = 0.06621		
Alpha	Table	Sig.
0.1	1.476	No
0.05	2.015	No
0.025	2.571	No
0.01	3.365	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9279, critical = 0.881.

Constituent: Calcium Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

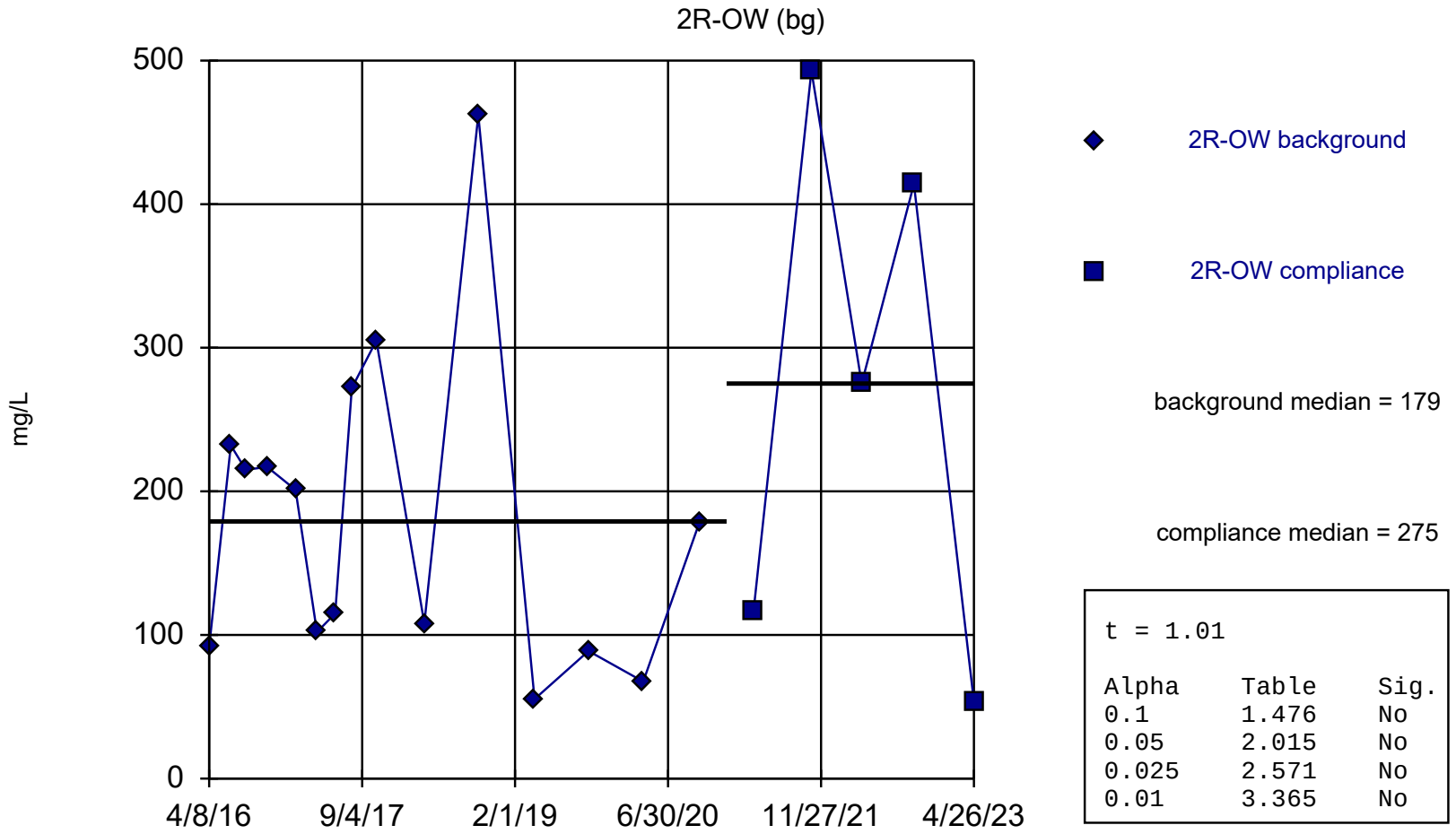
Welch's t-test

Constituent: Calcium (ug/L) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	205000	
6/20/2016	148000	
8/9/2016	145000	
10/20/2016	155000	
1/24/2017	152000	
4/6/2017	143000	
6/6/2017	145000	
8/1/2017	164000	
10/23/2017	170000	
4/2/2018	121000	
10/1/2018	190000	
4/8/2019	121000	
10/7/2019	132000	
4/8/2020	117000	
10/15/2020	124000	
4/14/2021		154000
10/26/2021		192000
4/13/2022		160000
10/6/2022		152000
4/26/2023		91800

Welch's t-test



t = 1.01		
Alpha	Table	Sig.
0.1	1.476	No
0.05	2.015	No
0.025	2.571	No
0.01	3.365	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8933, critical = 0.881.

Constituent: Chloride Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

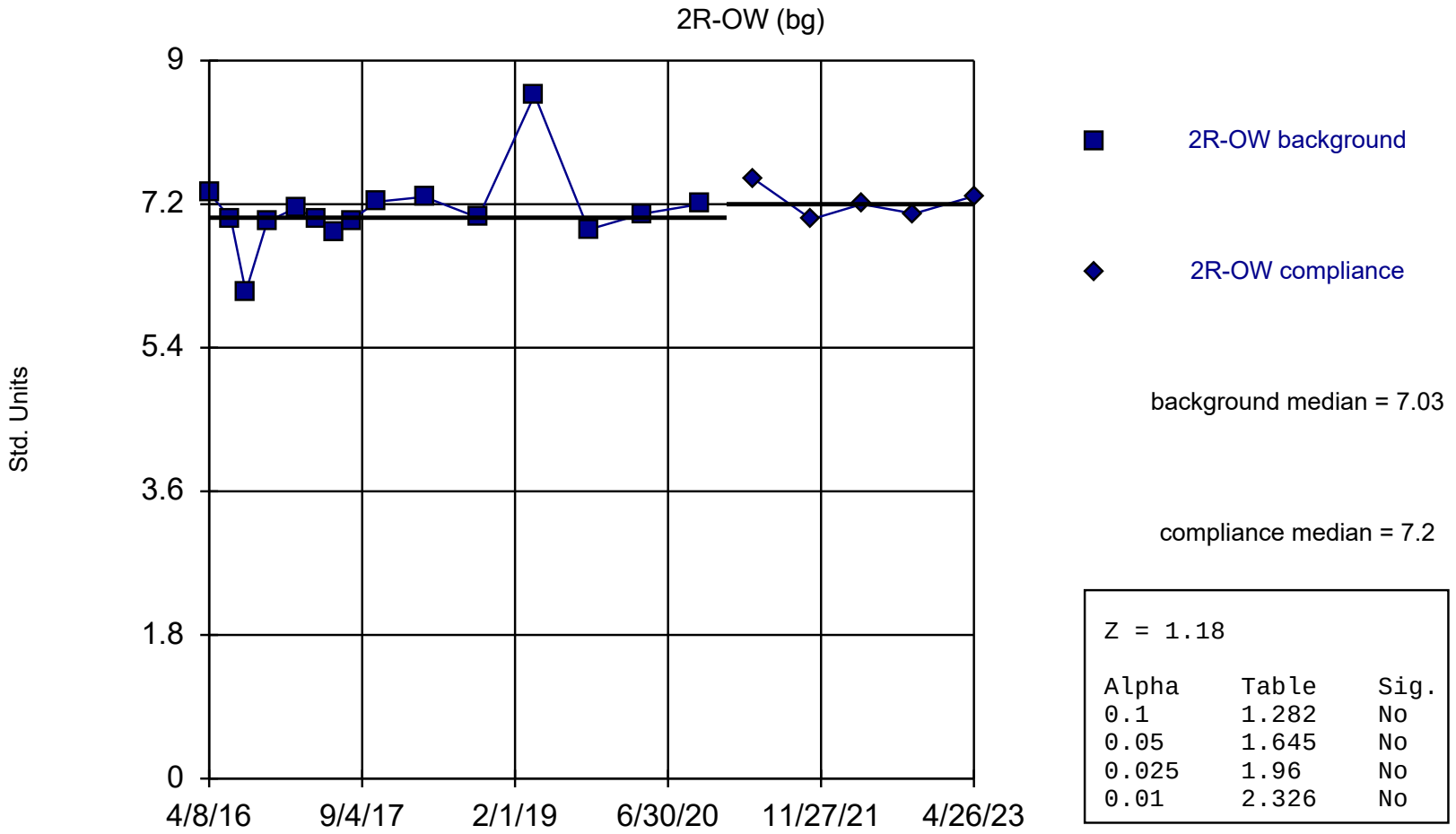
Welch's t-test

Constituent: Chloride (mg/L) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	91.7	
6/20/2016	232	
8/9/2016	215	
10/20/2016	217	
1/24/2017	201	
4/6/2017	102	
6/6/2017	115	
8/1/2017	272	
10/23/2017	305	
4/2/2018	108	
10/1/2018	462	
4/8/2019	55.3	
10/7/2019	88.8	
4/8/2020	67.5	
10/15/2020	179	
4/14/2021		116
10/26/2021		493
4/13/2022		275
10/6/2022		414
4/26/2023		53.4

Mann-Whitney (Wilcoxon Rank Sum)




```
Z = 1.18

Alpha     Table     Sig.
0.1       1.282     No
0.05      1.645     No
0.025     1.96      No
0.01      2.326     No
```

Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level.

Constituent: Field pH Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Mann-Whitney (Wilcoxon Rank Sum)

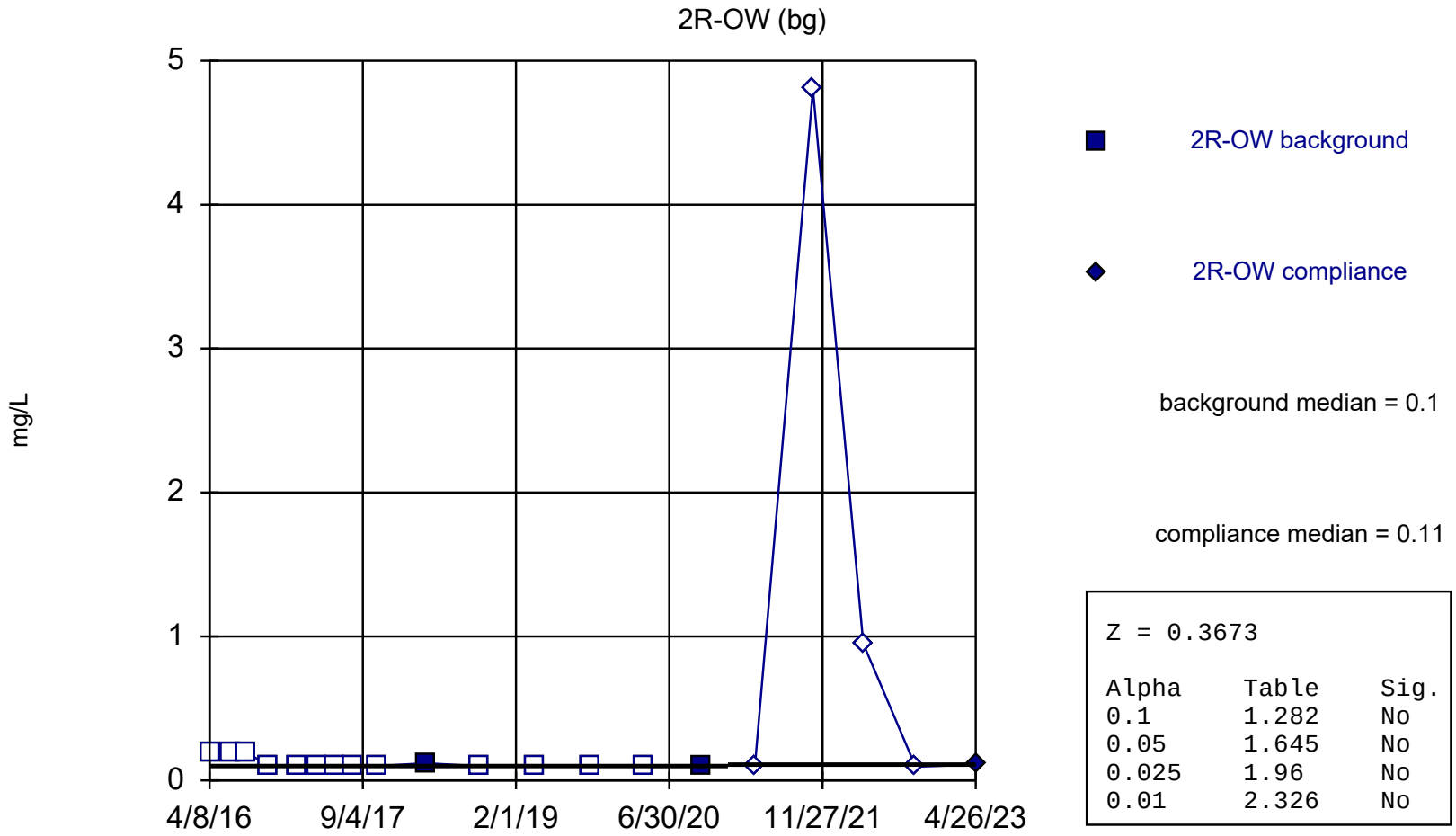
Constituent: Field pH (Std. Units) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	7.34	
6/20/2016	7.02	
8/9/2016	6.1 (X)	
10/20/2016	6.98	
1/24/2017	7.15	
4/6/2017	7.01	
6/6/2017	6.86	
8/1/2017	7	
10/23/2017	7.23	
4/2/2018	7.29	
10/1/2018	7.03	
4/8/2019	8.57	
10/7/2019	6.88	
4/8/2020	7.08	
10/15/2020	7.2	
4/14/2021		7.52
10/26/2021		7.01
4/13/2022		7.2
10/6/2022		7.08
4/26/2023		7.3

Hollow symbols indicate censored values.

Mann-Whitney (Wilcoxon Rank Sum)



Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because censored data exceeded 75%.

Constituent: Fluoride Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Mann-Whitney (Wilcoxon Rank Sum)

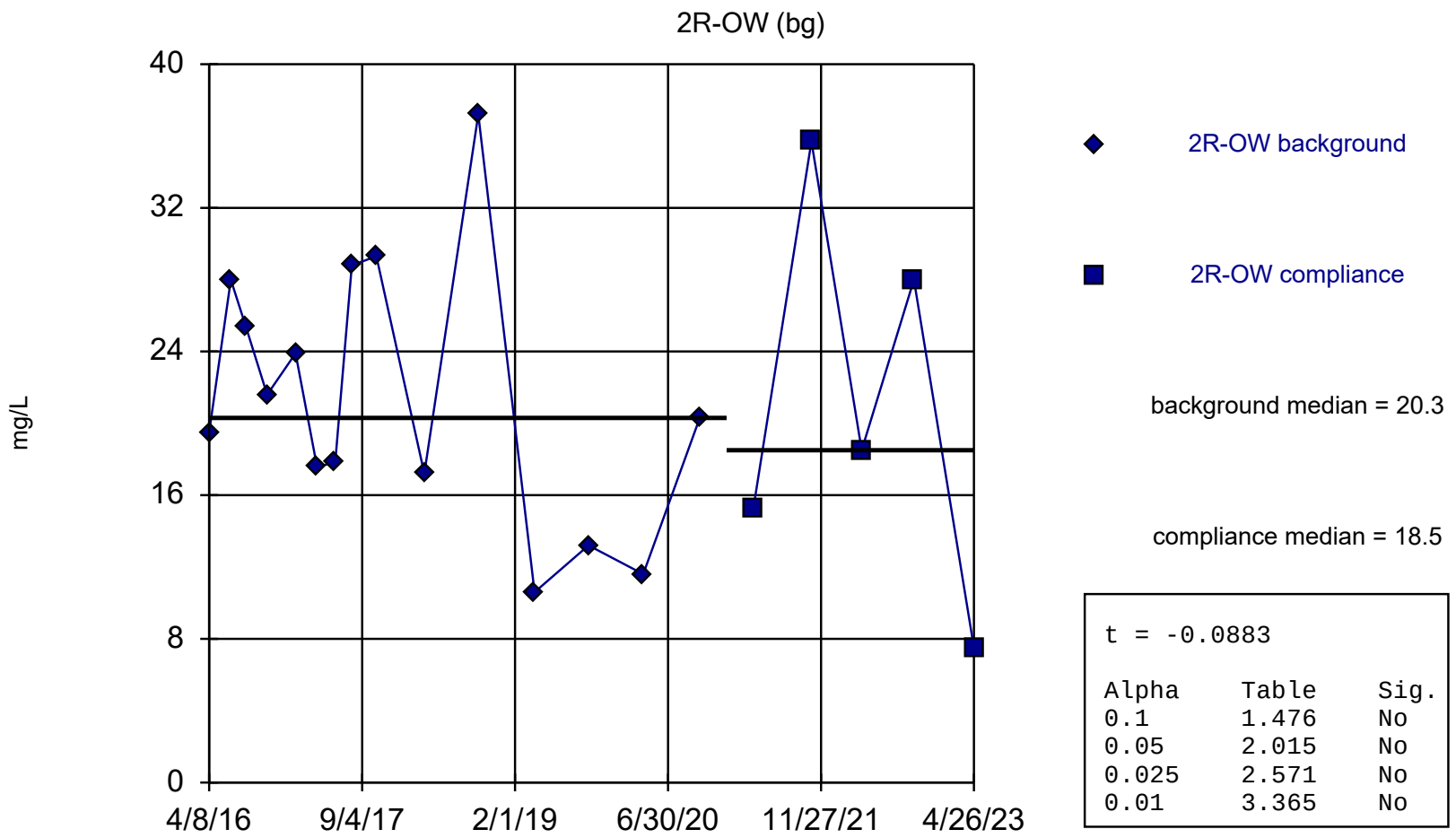
Constituent: Fluoride (mg/L) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	<0.2 (U)	
6/20/2016	<0.2 (U)	
8/9/2016	<0.2 (U)	
10/20/2016	<0.1 (U)	
1/24/2017	<0.1 (U)	
4/6/2017	<0.1 (U)	
6/6/2017	<0.1 (U)	
8/1/2017	<0.1 (U)	
10/23/2017	<0.1 (U)	
4/2/2018	0.12 (J)	
10/1/2018	<0.1 (U)	
4/8/2019	<0.1 (U)	
10/7/2019	<0.1 (U)	
4/8/2020	<0.095 (U)	
10/15/2020	0.096 (J)	
4/14/2021		<0.095 (U)
10/26/2021		<4.8 (UX)
4/13/2022		<0.95 (UX)
10/6/2022		<0.095 (U)
4/26/2023		0.11 (J)

ND substitution: RL or RL/2 if <15% NDs.

Welch's t-test




```
t = -0.0883

Alpha     Table     Sig.
0.1       1.476     No
0.05      2.015     No
0.025     2.571     No
0.01      3.365     No
```

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9672, critical = 0.881.

Constituent: Sulfate Analysis Run 7/28/2023 9:33 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

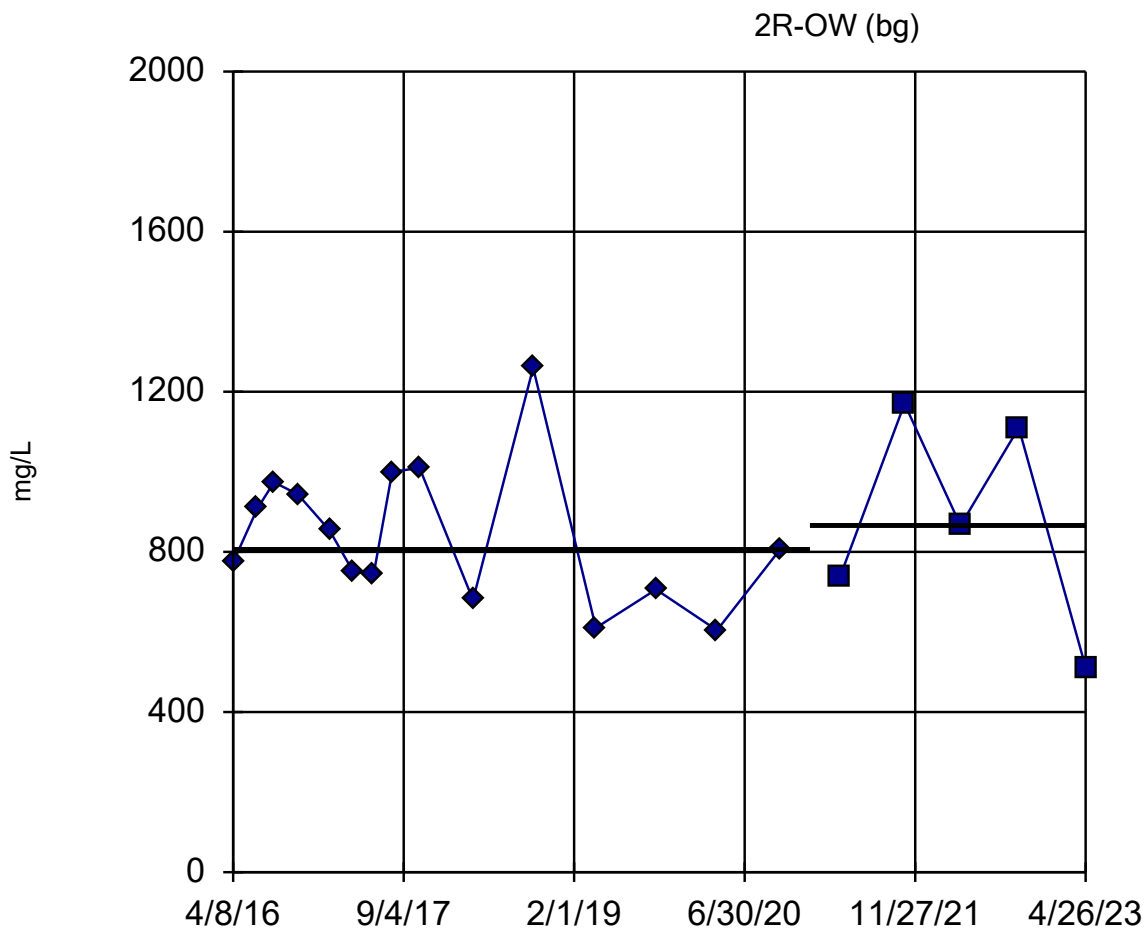
Welch's t-test

Constituent: Sulfate (mg/L) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	19.5	
6/20/2016	28	
8/9/2016	25.4	
10/20/2016	21.6	
1/24/2017	23.9	
4/6/2017	17.6	
6/6/2017	17.8	
8/1/2017	28.8	
10/23/2017	29.3	
4/2/2018	17.2	
10/1/2018	37.2	
4/8/2019	10.6	
10/7/2019	13.2	
4/8/2020	11.6	
10/15/2020	20.3	
4/14/2021		15.3
10/26/2021		35.7 (J)
4/13/2022		18.5 (J)
10/6/2022		28
4/26/2023		7.5

Welch's t-test



2R-OW background

2R-OW compliance

background median = 806

compliance median = 866

t = 0.289

Alpha	Table	Sig.
0.1	1.476	No
0.05	2.015	No
0.025	2.571	No
0.01	3.365	No

Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9458, critical = 0.881.

Constituent: Total Dissolved Solids Analysis Run 7/28/2023 9:34 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Welch's t-test

Constituent: Total Dissolved Solids (mg/L) Analysis Run 7/28/2023 9:37 AM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW	2R-OW
4/8/2016	774	
6/20/2016	908	
8/9/2016	974	
10/20/2016	944	
1/24/2017	854	
4/6/2017	750	
6/6/2017	744	
8/1/2017	1000	
10/23/2017	1010	
4/2/2018	680	
10/1/2018	1260	
4/8/2019	610	
10/7/2019	706	
4/8/2020	604	
10/15/2020	806	
4/14/2021		737
10/26/2021		1170
4/13/2022		866
10/6/2022		1110
4/26/2023		512

Attachment 4

Interwell Prediction Limit Analysis

Prediction Limit

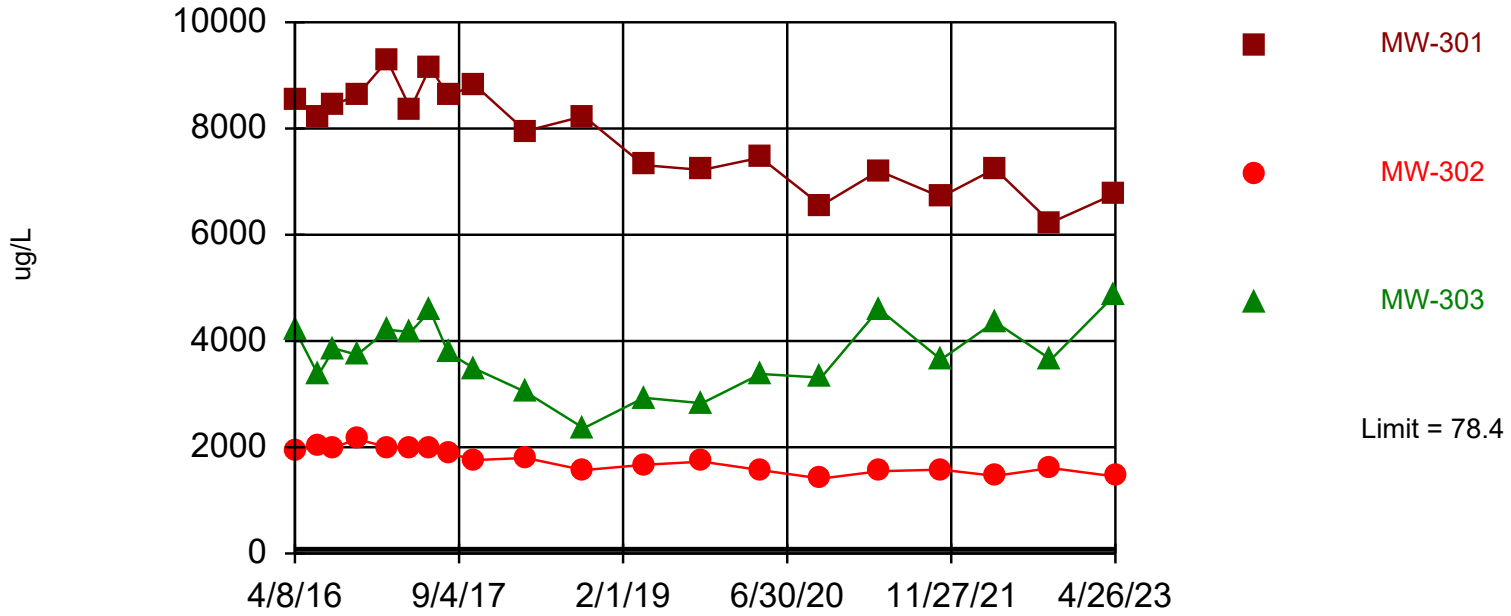
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020 Printed 7/28/2023, 3:36 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
Boron (ug/L)	**MW-301**	**78.4**	**n/a**	**4/25/2023**	**6770**	**Yes**	**20**	**2R-OW**	**43.49**	**18.47**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-302**	**78.4**	**n/a**	**4/26/2023**	**1450**	**Yes**	**20**	**2R-OW**	**43.49**	**18.47**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Boron (ug/L)	**MW-303**	**78.4**	**n/a**	**4/25/2023**	**4870**	**Yes**	**20**	**2R-OW**	**43.49**	**18.47**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Calcium (ug/L)	MW-301	201000	n/a	4/25/2023	87900	No	20	2R-OW	149090	27509	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-302	201000	n/a	4/26/2023	46900	No	20	2R-OW	149090	27509	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-303	201000	n/a	4/25/2023	128000	No	20	2R-OW	149090	27509	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-301	456	n/a	4/25/2023	17.9	No	20	2R-OW	203.1	133.8	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-302	456	n/a	4/26/2023	16.5	No	20	2R-OW	203.1	133.8	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-303	456	n/a	4/25/2023	22.3	No	20	2R-OW	203.1	133.8	0	None	No	0.002505	Param Inter 1 of 2
Field pH (Std. Units)	MW-301	8.57	n/a	4/25/2023	7.63	No	19	2R-OW	n/a	n/a	0	n/a	n/a	0.004634	NP Inter (normality) ...
Field pH (Std. Units)	MW-302	8.57	n/a	4/26/2023	7.85	No	19	2R-OW	n/a	n/a	0	n/a	n/a	0.004634	NP Inter (normality) ...
Field pH (Std. Units)	MW-303	8.57	n/a	4/25/2023	6.87	No	19	2R-OW	n/a	n/a	0	n/a	n/a	0.004634	NP Inter (normality) ...
Fluoride (mg/L)	MW-301	0.200	n/a	4/25/2023	0.21J	No	18	2R-OW	n/a	n/a	83.33	n/a	n/a	0.005131	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	**MW-302**	**0.200**	**n/a**	**4/26/2023**	**0.75**	**Yes**	**18**	**2R-OW**	**n/a**	**n/a**	**83.33**	**n/a**	**n/a**	**0.005131**	**NP Inter (NDs) 1 of 2**
Fluoride (mg/L)	MW-303	0.200	n/a	4/25/2023	0.095ND	No	18	2R-OW	n/a	n/a	83.33	n/a	n/a	0.005131	NP Inter (NDs) 1 of 2
Sulfate (mg/L)	**MW-301**	**36.7**	**n/a**	**4/25/2023**	**168**	**Yes**	**20**	**2R-OW**	**21.35**	**8.109**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Sulfate (mg/L)	**MW-302**	**36.7**	**n/a**	**4/26/2023**	**75.4**	**Yes**	**20**	**2R-OW**	**21.35**	**8.109**	**0**	**None**	**No**	**0.002505**	**Param Inter 1 of 2**
Sulfate (mg/L)	MW-303	36.7	n/a	4/25/2023	0.5J	No	20	2R-OW	21.35	8.109	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-301	1220	n/a	4/25/2023	554	No	20	2R-OW	851	197	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-302	1220	n/a	4/26/2023	344	No	20	2R-OW	851	197	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-303	1220	n/a	4/25/2023	740	No	20	2R-OW	851	197	0	None	No	0.002505	Param Inter 1 of 2

Exceeds Limit: MW-301, MW-302, MW-303

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=43.49, Std. Dev.=18.47, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8775, critical = 0.868. Kappa = 1.888 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Boron Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Boron (ug/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

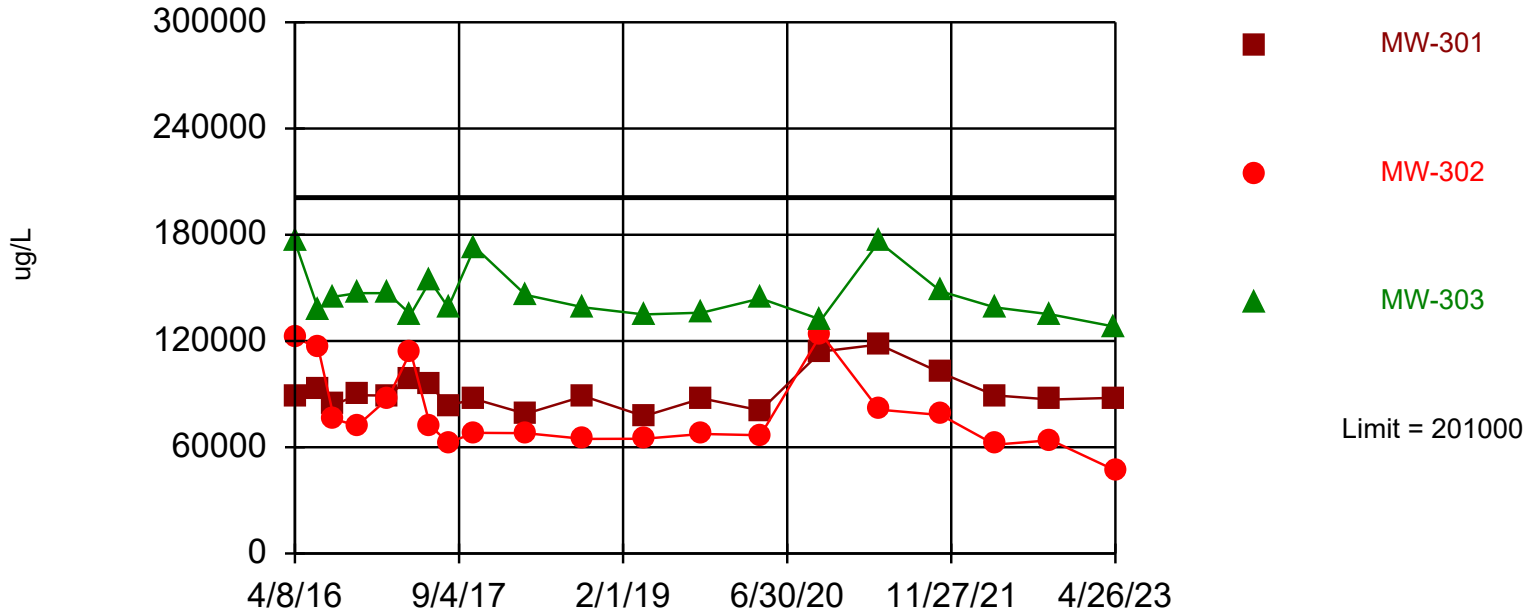
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	100	1950	4210	
4/11/2016				8550
6/20/2016	22.4	2010	3360	8190
8/9/2016	32.6	2000	3860	8450
10/20/2016	43.1	2150	3740	8620
1/23/2017				9280
1/24/2017	31.2	2000	4210	
4/6/2017	70.6	1970	4170	8370
6/6/2017	45.2	1970	4570	9160
8/1/2017	35.7			
8/2/2017		1890	3780	8610
10/23/2017	55.9			
10/24/2017		1760	3480	8820
4/2/2018	19.7	1800	3040	7950
10/1/2018	34.7	1570	2360	8230
4/8/2019	35.8	1670	2930	7310
10/7/2019	58.8	1730	2830	7220
4/8/2020	52.3	1570	3380	7450
10/15/2020	29.9	1410	3310	6550
4/14/2021	45.7	1550	4600	7200
10/26/2021	47.2	1580	3650	6710
4/13/2022	27.9	1460	4360	7240
10/6/2022	49	1610	3650	6230
4/25/2023			4870	6770
4/26/2023	32	1450		

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=149090, Std. Dev.=27509, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9729, critical = 0.868. Kappa = 1.888 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Calcium Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

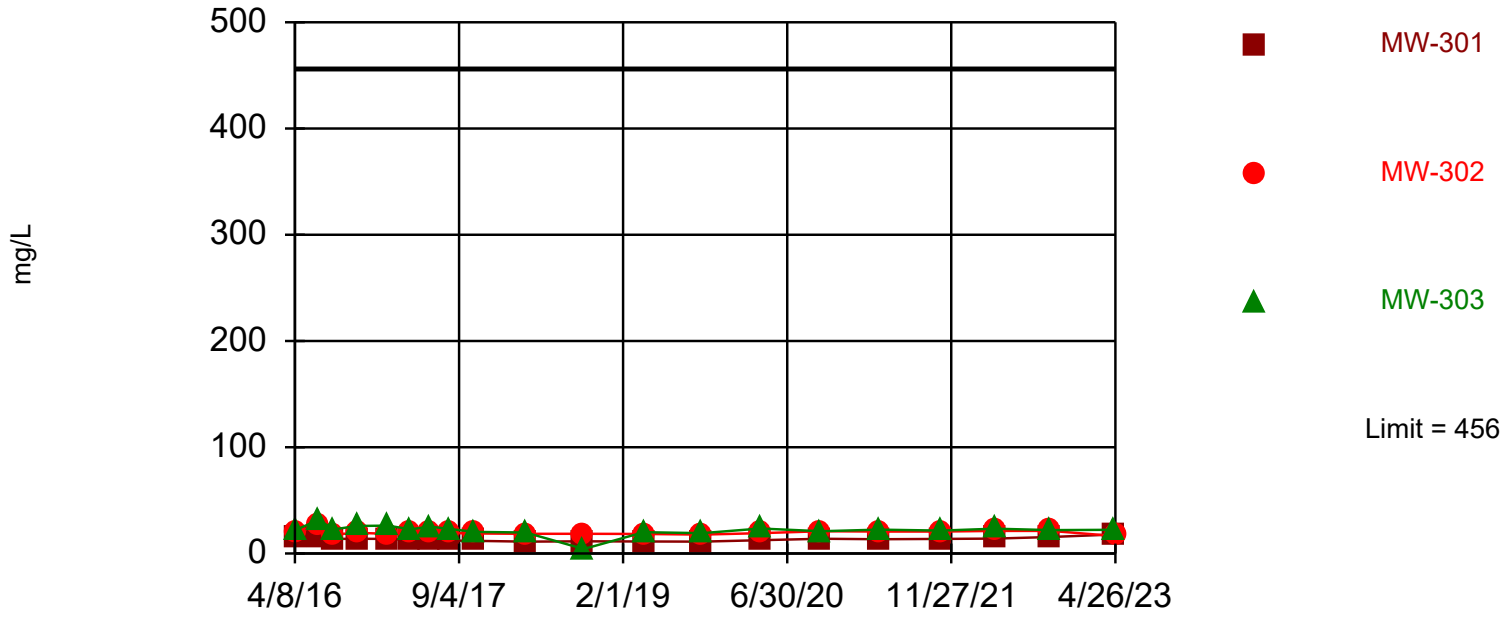
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	205000	122000	176000	
4/11/2016				88700
6/20/2016	148000	116000	138000	92200
8/9/2016	145000	75900	145000	84000
10/20/2016	155000	72100	147000	89400
1/23/2017				89200
1/24/2017	152000	87400	147000	
4/6/2017	143000	114000	135000	98800
6/6/2017	145000	72200	154000	94900
8/1/2017	164000			
8/2/2017		62600	139000	83600
10/23/2017	170000			
10/24/2017		68100	173000	87200
4/2/2018	121000	68000	146000	78900
10/1/2018	190000	64700	139000	88800
4/8/2019	121000	64800	135000	77500
10/7/2019	132000	67500	136000	87600
4/8/2020	117000	66800	144000	80800
10/15/2020	124000	124000	132000	114000
4/14/2021	154000	81200	176000	118000
10/26/2021	192000	78200	148000	102000
4/13/2022	160000	61500	139000	89300
10/6/2022	152000	64000	135000	86900
4/25/2023			128000	87900
4/26/2023	91800	46900		

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=203.1, Std. Dev.=133.8, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8906, critical = 0.868. Kappa = 1.888 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Chloride Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

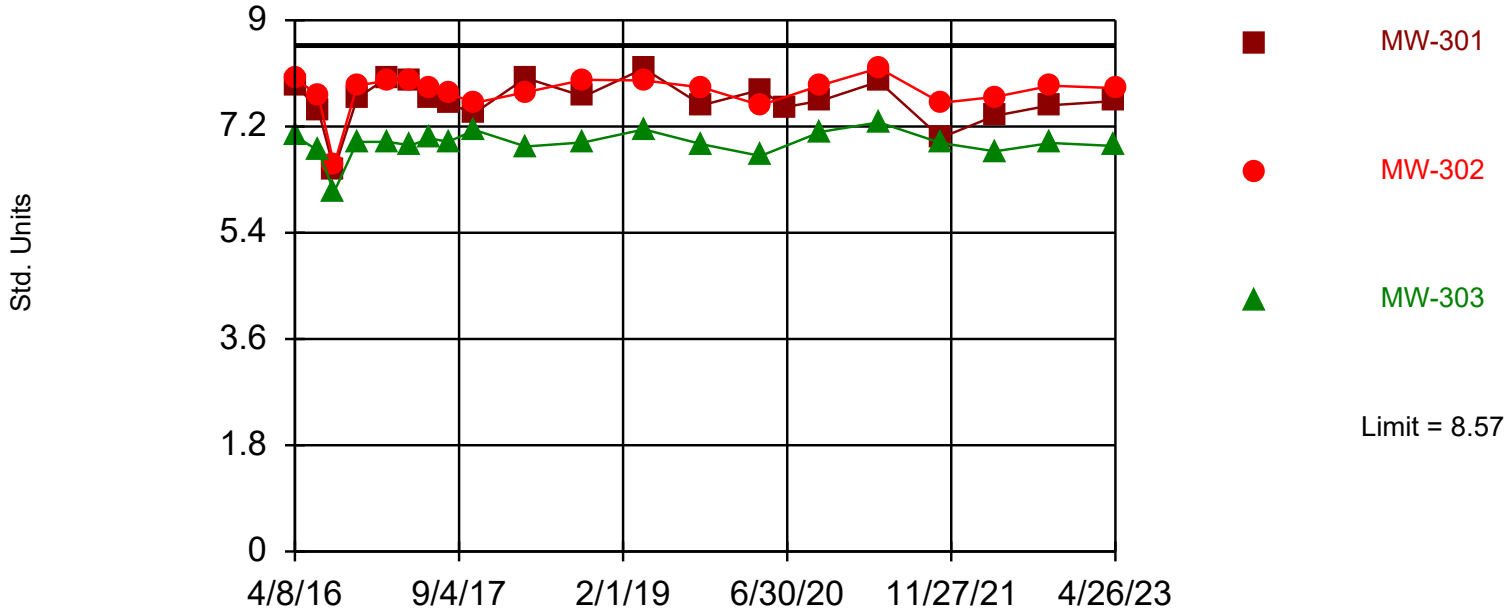
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	91.7	18.9	21.8	
4/11/2016				16.2
6/20/2016	232	27.2	31.5	15.9
8/9/2016	215	18	22.8	13.7
10/20/2016	217	19.5	26	13.9
1/23/2017				13.8
1/24/2017	201	18.6	26.2	
4/6/2017	102	18.9	22.7	12.7
6/6/2017	115	20	25.4	13.5
8/1/2017	272			
8/2/2017		19.3	23.2	12.3
10/23/2017	305			
10/24/2017		18.9	20.4	11.9
4/2/2018	108	18.5	19.7	11.2
10/1/2018	462	18.6	4.3	11.5
4/8/2019	55.3	18.4	20	11.4
10/7/2019	88.8	17.8	19.1	11.1
4/8/2020	67.5	19.2	23.5	12.5
10/15/2020	179	20.9	20.9	13.9
4/14/2021	116	20.6	22.5	13.5
10/26/2021	493	20.7	21.6	13.8
4/13/2022	275	21.2	23.4	14
10/6/2022	414	21.2	22	15.5
4/25/2023			22.3	17.9
4/26/2023	53.4	16.5		

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 19 background values. Annual per-constituent alpha = 0.02748. Individual comparison alpha = 0.004634 (1 of 2). Comparing 3 points to limit.

Constituent: Field pH Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Field pH (Std. Units) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

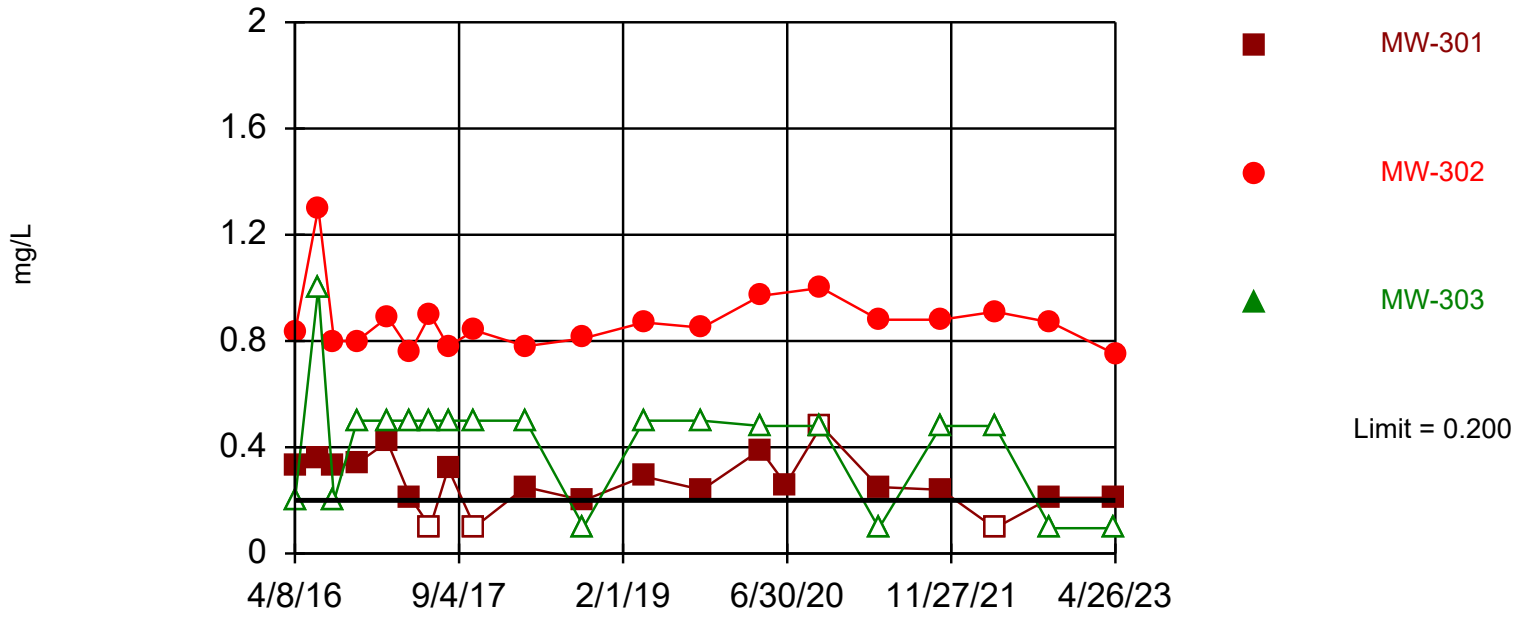
	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	7.34	8.01	7.04	
4/11/2016				7.91
6/20/2016	7.02	7.73	6.79	7.48
8/9/2016	6.1 (X)	6.55	6.09	6.47
10/20/2016	6.98	7.89	6.94	7.68
1/23/2017				8.03
1/24/2017	7.15	7.98	6.94	
4/6/2017	7.01	7.99	6.88	7.98
6/6/2017	6.86	7.84	7	7.7
8/1/2017	7			
8/2/2017		7.76	6.94	7.58
10/23/2017	7.23			
10/24/2017		7.6	7.14	7.43
4/2/2018	7.29	7.78	6.86	8.02
10/1/2018	7.03	7.99	6.93	7.71
4/8/2019	8.57	7.98	7.15	8.18
10/7/2019	6.88	7.86	6.9	7.56
4/8/2020	7.08	7.56	6.7	7.82
6/26/2020				7.53
10/15/2020	7.2	7.9	7.11	7.64
4/14/2021	7.52	8.19	7.27	7.96
10/26/2021	7.01	7.6	6.92	7.01
4/13/2022	7.2	7.7	6.78	7.38
10/6/2022	7.08	7.89	6.92	7.56
4/25/2023			6.87	7.63
4/26/2023	7.3	7.85		

Hollow symbols indicate censored values.

Exceeds Limit: MW-302

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 18 background values. 83.33% NDs. Annual per-constituent alpha = 0.0304. Individual comparison alpha = 0.005131 (1 of 2). Comparing 3 points to limit.

Constituent: Fluoride Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Fluoride (mg/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-303	MW-302	MW-301
4/8/2016	<0.2 (U)	<0.2 (U)	0.83	
4/11/2016				0.33 (J)
6/20/2016	<0.2 (U)	<1 (U)	1.3 (J)	0.36 (J)
8/9/2016	<0.2 (U)	<0.2 (U)	0.8	0.33 (J)
10/20/2016	<0.1 (U)	<0.5 (U)	0.8	0.34
1/23/2017				0.42
1/24/2017	<0.1 (U)	<0.5 (U)	0.89 (J)	
4/6/2017	<0.1 (U)	<0.5 (U)	0.76	0.21 (J)
6/6/2017	<0.1 (U)	<0.5 (U)	0.9	<0.1 (U)
8/1/2017	<0.1 (U)			
8/2/2017		<0.5 (U)	0.78	0.32
10/23/2017	<0.1 (U)			
10/24/2017		<0.5 (U)	0.84	<0.1 (U)
4/2/2018	0.12 (J)	<0.5 (U)	0.78	0.25 (J)
10/1/2018	<0.1 (U)	<0.1 (U)	0.81	0.2 (J)
4/8/2019	<0.1 (U)	<0.5 (U)	0.87	0.29 (J)
10/7/2019	<0.1 (U)	<0.5 (U)	0.85	0.24 (J)
4/8/2020	<0.095 (U)	<0.48 (U)	0.97	0.39
6/26/2020				0.26 (J)
10/15/2020	0.096 (J)	<0.48 (U)	1 (J)	<0.48 (U)
4/14/2021	<0.095 (U)	<0.095	0.88	0.25 (J)
10/26/2021	<4.8 (UX)	<0.48	0.88	0.24 (J)
4/13/2022	<0.95 (UX)	<0.48 (U)	0.91	<0.095 (U)
10/6/2022	<0.095 (U)	<0.095 (U)	0.87	0.21 (J)
4/25/2023		<0.095 (U)		0.21 (J)
4/26/2023	0.11 (J)		0.75	

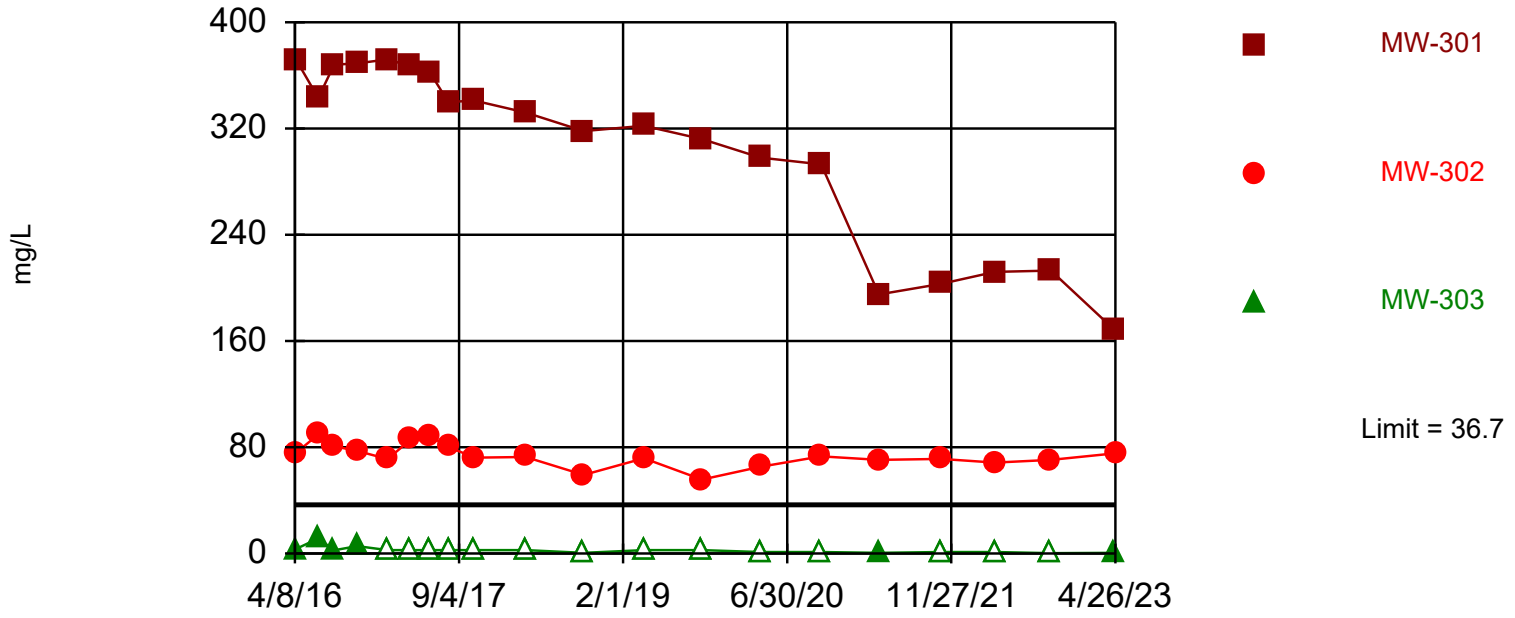
ND substitution: RL or RL/2 if <15% NDs.

Hollow symbols indicate censored values.

Exceeds Limit: MW-301, MW-302

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=21.35, Std. Dev.=8.109, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9727, critical = 0.868. Kappa = 1.888 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Sulfate Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

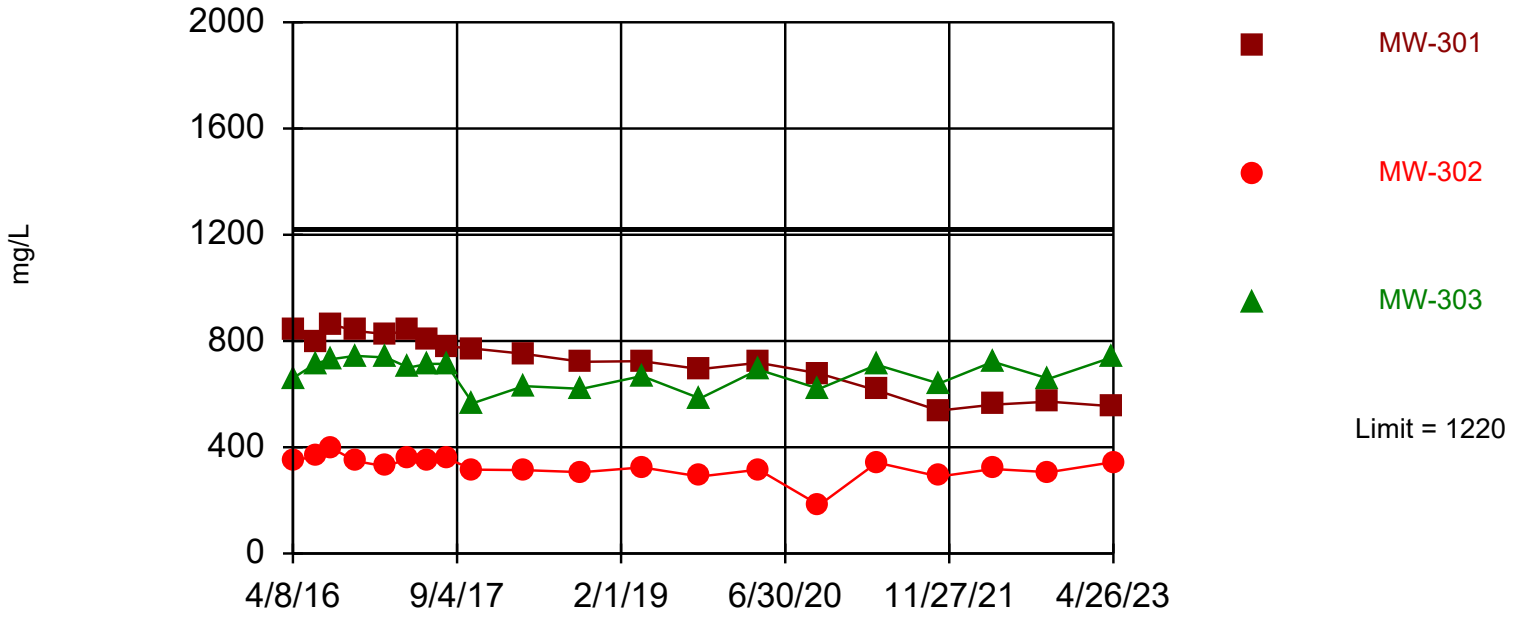
	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	19.5	75.1	3 (J)	
4/11/2016				372
6/20/2016	28	89.6	11.4 (J)	343
8/9/2016	25.4	80.7	2.4 (J)	368
10/20/2016	21.6	77.2	5.6 (J)	369
1/23/2017				372
1/24/2017	23.9	71.1	<5 (U)	
4/6/2017	17.6	85.8	<5 (U)	367
6/6/2017	17.8	88.5	<5 (U)	362
8/1/2017	28.8			
8/2/2017		80.2	<5 (U)	340
10/23/2017	29.3			
10/24/2017		72.2	<5 (U)	341
4/2/2018	17.2	72.7	<5 (U)	332
10/1/2018	37.2	59.2	<1 (U)	318
4/8/2019	10.6	71.7	<5 (U)	322
10/7/2019	13.2	55.7	<5 (U)	312
4/8/2020	11.6	65.3	<2.2 (U)	298
10/15/2020	20.3	73.1	<2.2 (U)	293
4/14/2021	15.3	70.5	0.54 (J)	195
10/26/2021	35.7 (J)	71.2	<2.2 (U)	203
4/13/2022	18.5 (J)	68.5	<2.2 (U)	212
10/6/2022	28	70.5	<0.44 (U)	213
4/25/2023			0.5 (J)	168
4/26/2023	7.5	75.4		

ND substitution: RL or RL/2 if <15% NDs.

Within Limit

Prediction Limit

Interwell Parametric



Background Data Summary: Mean=851, Std. Dev.=197, n=20. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9796, critical = 0.868. Kappa = 1.888 (c=7, w=3, 1 of 2, event alpha = 0.05132). Report alpha = 0.007498. Individual comparison alpha = 0.002505. Comparing 3 points to limit.

Constituent: Total Dissolved Solids Analysis Run 7/28/2023 3:34 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

Prediction Limit

Constituent: Total Dissolved Solids (mg/L) Analysis Run 7/28/2023 3:36 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG_Clsd - Chem- export-Dec2020

	2R-OW (bg)	MW-302	MW-303	MW-301
4/8/2016	774	352	660	
4/11/2016				838
6/20/2016	908	364	716	794
8/9/2016	974	396	732	862
10/20/2016	944	348	744	838
1/23/2017				826
1/24/2017	854	328	738	
4/6/2017	750	358	700	838
6/6/2017	744	350	714	804
8/1/2017	1000			
8/2/2017		360	714	780
10/23/2017	1010			
10/24/2017		316	566	772
4/2/2018	680	314	630	752
10/1/2018	1260	306	620	722
4/8/2019	610	324	668	724
10/7/2019	706	290	584	694
4/8/2020	604	316	692	718
10/15/2020	806	182	620	678
4/14/2021	737	342	710	614
10/26/2021	1170	290	640	538
4/13/2022	866	318	722	560
10/6/2022	1110	306	658	572
4/25/2023			740	554
4/26/2023	512	344		