

# 2020 Annual Groundwater Monitoring and Corrective Action Report

Edgewater Generating Station  
Sheboygan, Wisconsin

Prepared for:



**SCS ENGINEERS**

25220068.00 | January 29, 2021

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## OVERVIEW OF CURRENT STATUS

### Edgewater Generating Station, Surface Impoundments 2020 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 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
<b>Monitoring Status – Start of Year</b>	(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
<b>Monitoring Status – End of Year</b>	(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
<b>Statistically Significant Increases (SSIs)</b>	(iii) If it was determined that there was a statistically significant increase 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>April/June 2020</u> Boron: MW-301, MW-302, MW-303 Fluoride: MW-302 pH: MW-301, MW-302 Sulfate: MW-301, MW-302  <u>October 2020</u> Boron: MW-301, MW-302, MW-303 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 2019 and April 2020 events during 2020. Assessment monitoring not required. Alternative sources for October 2020 SSIs will be evaluated in 2021.

Category	Rule Requirement	Site Status
<b>Statistically Significant Levels (SSL) Above Groundwater Protection Standard</b>	(iv) If it was determined that there was a statistically significant level above the groundwater protection standard 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.	
<b>Selection of Remedy</b>	(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
<b>Corrective Action</b>	(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 2020 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the Coal Combustion Residuals (CCR) Rule [40 CFR 257.50-107]. Specifically, this report was prepared to fulfill the requirements of 40 CFR 257.90(e). The applicable sections of the Rule are provided below in italics, followed by applicable information relative to the 2020 Annual Groundwater Monitoring and Corrective Action Report for the CCR Units.

This report covers the period of groundwater monitoring from January 1, 2020, through December 31, 2020.

The groundwater monitoring system at the Edgewater Generating Station (EDG) is a multiunit system. The Edgewater Generation Station has four existing 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 in progress in 2020 and will be completed in 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 CCR surface impoundments that are currently undergoing closure and expected to complete closure in 2021. Adjacent to the surface impoundments is an inactive CCR landfill that was closed prior to 2015 and is regulated by the Wisconsin Department of Natural Resources (License #2524). A groundwater monitoring network 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 show 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.

Shallow groundwater in the area of the EDG site generally flows to the south-southeast. There is some localized groundwater mounding associated with the EDG ponds. The water table maps shown on **Figures 3** and **4** are based on groundwater levels measured in the unconsolidated deposits during the April 2020 and October 2020 detection monitoring events. A summary of the sampling events that occurred throughout 2020 is shown in **Table 2**. The water table maps show a generally southward flow direction, with localized groundwater mounding in the area of the EDG ponds. 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**.

## 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. 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 2020. To accommodate regrading due to pond closure construction activities occurring at the site, the casing of downgradient monitoring well MW-301 was extended during November 2020 and the casing of monitoring wells MW-302 and MW-303 was shortened during September 2020. A small amount of filter pack sand, originally placed above ground between the well casing and protective casing, fell into the well during the casing height reduction work. The sand was removed and the well was redeveloped prior to the October sampling event. The well casing elevations were resurveyed after the casing modifications were completed, as shown in **Table 3B**.

### **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 2020 for Appendix III constituents. A resampling event for monitoring well MW-301 was completed in June 2020 to further evaluate the GPS exceedance at MW-301. The resample was done in accordance with the Sampling and Analysis Plan for the site, which allows for 1-of-2 testing. 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 sampling results for Appendix III parameters in 2020 are summarized in **Tables 5A and 5B**. Field parameter results for the 2020 sampling events are provided in **Table 6**. The analytical laboratory



reports for 2020 are provided in **Appendix C**. Historical results for each monitoring well 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 2020. The EDG CCR units remained in the detection monitoring program.

In 2020, the monitoring results for the October 2019 and April 2020 monitoring events were evaluated for statistically significant increases (SSIs) in detection monitoring parameters relative to background. The Interwell UPLs were updated in January 2021 to be based on additional background monitoring results from compliance wells (MW-301, MW-302, and MW-303). The Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (USEPA, 2009) recommends periodic updating of background. The UPL update calculations are included in **Appendix E**. The UPLs calculated in January 2021 were applied to the October 2020 monitoring results (**Table 5B**).

For both the October 2019 and April 2020 events, SSIs for boron, fluoride, field pH, and sulfate were identified; 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 F**.

### **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 2020 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 2020.

#### **Summary of Key Actions Completed (2020):**

- Statistical evaluation and determination of SSIs for the October 2019 and April 2020 monitoring events.

- ASD reports for the SSIs identified from the October 2019 and April 2020 monitoring events.
- Two semiannual groundwater sampling and analysis events (April and October 2019).
- One resampling event in June 2020.
- Adjustments to well casing heights to accommodate regrading associated with closure of the ponds.

**Description of Any Problems Encountered.** No problems were encountered in 2020.

**Discussion of Actions to Resolve the Problems.** Not applicable.

**Projection of Key Activities for the Upcoming Year (2021):**

- Statistical evaluation and determination of any SSIs for the October 2020 and April 2021 monitoring events.
- If an SSI is determined, then within 90 days either:
  - Complete alternative source demonstration (if applicable), or
  - Establish an assessment monitoring program.
- Two semiannual groundwater sampling and analysis events (April and October 2021).

### **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 2019 and April 2020 sampling events are provided in **Appendix F**. 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.

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- 2 Groundwater Samples Summary
- 3A Groundwater Elevation Summary – State Wells
- 3B Groundwater Elevation Summary – CCR Wells
- 4 Groundwater Gradients and Average Linear Flow Velocities
- 5A 2020 Groundwater Analytical Results Summary – January to September 2020
- 5B 2020 Groundwater Analytical Results Summary – October 2020
- 6 2020 Groundwater Field Data Summary

**Table 1. Groundwater Monitoring Well Network  
Edgewater Closed Landfill  
SCS Engineers Project #25220068.00**

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

Created by: RM  
 Last revision by: RM  
 Checked by: NDK

Date: 12/14/2020  
 Date: 1/7/2021  
 Date: 1/7/2021

**Table 2. CCR Rule Groundwater Samples Summary  
Edgewater Generating Station  
SCS Engineers Project #25220068.00**

Sample Dates	Downgradient Wells			Background Well
	MW-301	MW-302	MW-303	2R-OW
4/8/2020	D	D	D	D
6/26/2020	D-R	--	--	--
10/15/2020	D	D	D	D
Total Samples	3	2	2	2

Abbreviations:

D = Required by Detection Monitoring Program

D-R = Detection Monitoring Retest Sample

-- = Not Sampled

Created by:	<u>NDK</u>	Date:	<u>1/4/2018</u>
Last revision by:	<u>RM</u>	Date:	<u>1/7/2021</u>
Checked by:	<u>NDK</u>	Date:	<u>1/7/2021</u>

I:\25220068.00\Deliverables\2020 Fed CCR Annual Report\Tables\[Table 2 - Groundwater Samples Summary.xlsx]GW Summary

**Table 3A. Groundwater Elevations - State Monitoring Wells  
Edgewater 1-4 Closed Ash Disposal Facility / SCS Engineers Project #25220068.00**

Ground Water Elevation in feet above mean sea level (amsl)																						
Well Number	1-OW	2R-OW	3R-OW	4R-OW	5-OW	W-5A	6AR	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 (feet amsl)	591.72	612.72	591.32	595.60	600.72	601.84	591.32	590.98	593.41	592.51	586.47	588.86	589.25	590.81	589.00	589.07	614.63	615.02	620.98	614.04	587.42	
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	591.71	589.56	583.49	585.16	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 <sup>(1)</sup>	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 <sup>(1)</sup>	585.38	588.22	587.53	583.75	583.75	NM <sup>(1)</sup>	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 <sup>(1)</sup>	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 <sup>(2)</sup>	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
Bottom of Well 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	570.12	0.00

Notes: Created by: MDB Date: 5/6/2013  
 NM = not measured Last revision by: JSN Date: 10/20/2020  
 ABAND = abandoned Checked by: RM Date: 10/21/2020

- 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

I:\25220068.00\Deliverables\2020 Fed CCR Annual Report\Tables\[Table 3A\_Groundwater Elevation Summary - State.xls]levels

**Table 3B. Groundwater Elevations - CCR Monitoring Wells**  
**WPL - Edgewater 1-4 (Closed) Ash Disposal Facility / SCS Engineers Project #25220068.00**

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	MW-301	MW-302	MW-303	2R-OW
<b>Top of Casing Elevation (feet amsl)</b>	604.42	615.15	611.99	612.72
<b>Revised Top of Casing Elevation (feet amsl)</b>	--	606.77	603.87	--
<b>Screen Length (ft)</b>	5.00	5.00	5.00	10.00
<b>Total Depth (ft from top of casing)</b>	27.47	40.00	33.26	14.50
<b>Top of Well Screen Elevation (ft)</b>	581.95	580.15	579.60	608.22
<b>Measurement Date</b>				
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
June 6, 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
April 8, 2020	599.17	595.33	588.66	608.97
June 26, 2020	597.89	--	--	--
October 15, 2020	595.10	590.18	585.07	604.27
<b>Bottom of Well Elevation (ft)</b>	576.95	575.15	578.73	598.22

Notes:  
 NM = not measured

Created by:	<u>NDK</u>	Date:	<u>4/8/2020</u>
Last rev. by:	<u>ZTW</u>	Date:	<u>1/15/2021</u>
Checked by:	<u>TK</u>	Date:	<u>1/16/2021</u>

I:\25220068.00\Deliverables\2020 Fed CCR Annual Report\Tables\[Table 3B\_Groundwater Elevation Summary - CCR.xls]levels



**Table 4. Horizontal Gradients and Flow Velocity  
Edgewater Closed Landfill  
SCS Engineers Project #25220068.00  
January - December 2020**

South					
Sampling Dates	h1 (ft)	h2 (ft)	$\Delta l$ (ft)	$\Delta h/\Delta l$ (ft/ft)	V (ft/d)
4/8-9/2020	595.0	590.0	185	0.03	0.02
10/14-15/2020	595.0	590.0	300	0.02	0.01

Southeast					
Sampling Dates	h1 (ft)	h2 (ft)	$\Delta l$ (ft)	$\Delta h/\Delta l$ (ft/ft)	V (ft/d)
4/8-9/2020	595.0	590.0	67	0.08	0.05
10/14-15/2020	595.0	590.0	250	0.02	0.01

Sampling Dates	K (ft/d)	n	Average $\Delta h/\Delta l$ (ft/ft)	V (ft/d)
4/8-9/2020	0.274	0.40	0.051	0.035
10/14-15/2020	0.274	0.40	0.018	0.013

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	9.7E-05	0.274

Assumed Porosity, n
0.40

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

ft = feet

ft/d = feet per day

K = hydraulic conductivity

n = effective porosity

V = groundwater flow velocity

h1, h2 = point interpreted

groundwater elevation at locations 1

$\Delta l$  = distance between location 1 and 2

$\Delta h/\Delta l$  = hydraulic gradient

Created by: RM  
Last revision by: RM  
Checked by: TK

Date: 12/29/2020  
Date: 1/15/2021  
Date: 1/16/2021

**Table 5A. Groundwater Analytical Results Summary -  
April - June 2020  
Edgewater Generating Station / SCS Engineers Project #25220068.00**

Parameter Name	UPL	Background Well	Compliance Wells			
		2R-OW	MW-301		MW-302	MW-303
		4/8/2020	4/8/2020	6/26/2020	4/8/2020	4/8/2020
<b>Appendix III</b>						
Boron, µg/L	107	52.3	7,450	--	1,570	3,380
Calcium, µg/L	206,247	117,000	80,800	--	66,800	144,000
Chloride, mg/L	378	67.5	12.5	--	19.2	23.5
Fluoride, mg/L	DQ	<0.095	0.39 M0	0.26 J,M0	0.97	<0.48 D3
Field pH, Std. Units	7.47	7.08	7.82	7.53	7.56	6.7
Sulfate, mg/L	35	11.6	298	--	65.3	<2.2 D3
Total Dissolved Solids, mg/L	1,145	604	718	--	316	692

**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                      LOD = Limit of Detection                      mg/L = milligrams per liter  
 GPS = Groundwater Protection Standard      LOQ = Limit of Quantitation                      µg/L = micrograms per liter  
 -- = Not Applicable

**Lab Notes:**

D3 = Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.  
 J = Estimated concentration at or above the LOD and below the LOQ.  
 M0 = Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.

**Notes:**

1. An individual result above the UPL does not constitute an SSI above background. See the accompanying report text for identification of statistically significant results.
2. Interwell UPLs calculated based on results from background wells 2R-OW. Interwell UPLs based on 1-of-2 retesting approach.

Created by: <u>NDK</u>	Date: <u>1/7/2021</u>
Last revision by: <u>SCC</u>	Date: <u>1/15/2021</u>
Checked by: <u>TK</u>	Date: <u>1/15/2021</u>
Scientist/PM QA/QC: <u>TK</u>	Date: <u>1/15/2021</u>



**Table 6. 2020 Groundwater Field Monitoring Data**  
**Edgewater 1-4 (Closed) Ash Disposal Facility / SCS Engineers Project #25220068.00**  
**January - December 2020**

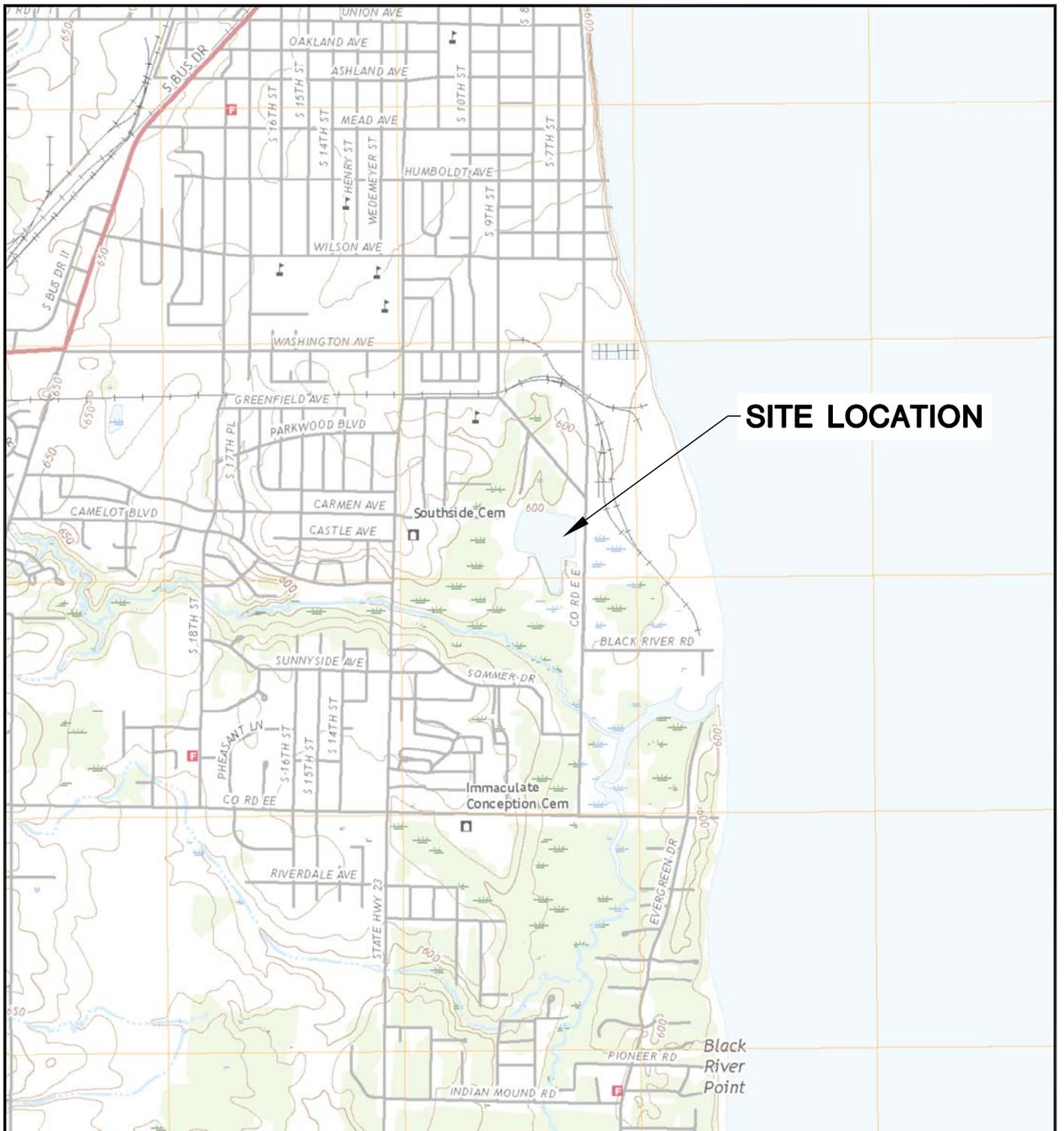
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	4/8/2020	599.17	8.5	7.82	6.90	977	17.1	37.12
	6/26/2020	597.89	16.8	7.53	5.47	983	49.1	62.57
	10/15/2020	595.10	11.2	7.64	0.80	996	140.0	130.00
MW-302	4/8/2020	595.33	11.3	7.56	0.40	476	-107.6	69.22
	10/15/2020	590.18	11.2	7.90	0.30	523	-83.0	161.80
MW-303	4/8/2020	588.66	10.0	6.70	0.20	1,241	-102.9	87.60
	10/15/2020	585.07	10.9	7.11	0.20	1,123	-32.0	70.42
2R-OW	4/8/2020	608.97	6.1	7.08	1.50	1,081	43.7	15.24
	10/15/2020	604.27	13.6	7.20	3.50	1,490	282.0	28.74

Created by: RM \_\_\_\_\_  
 Last revision by: RM \_\_\_\_\_  
 Checked by: TK \_\_\_\_\_

Date: 12/22/2020  
 Date: 1/6/2021  
 Date: 1/16/2021

## Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 April 2020 Water Table Map
- 4 October 2020 Water Table Map



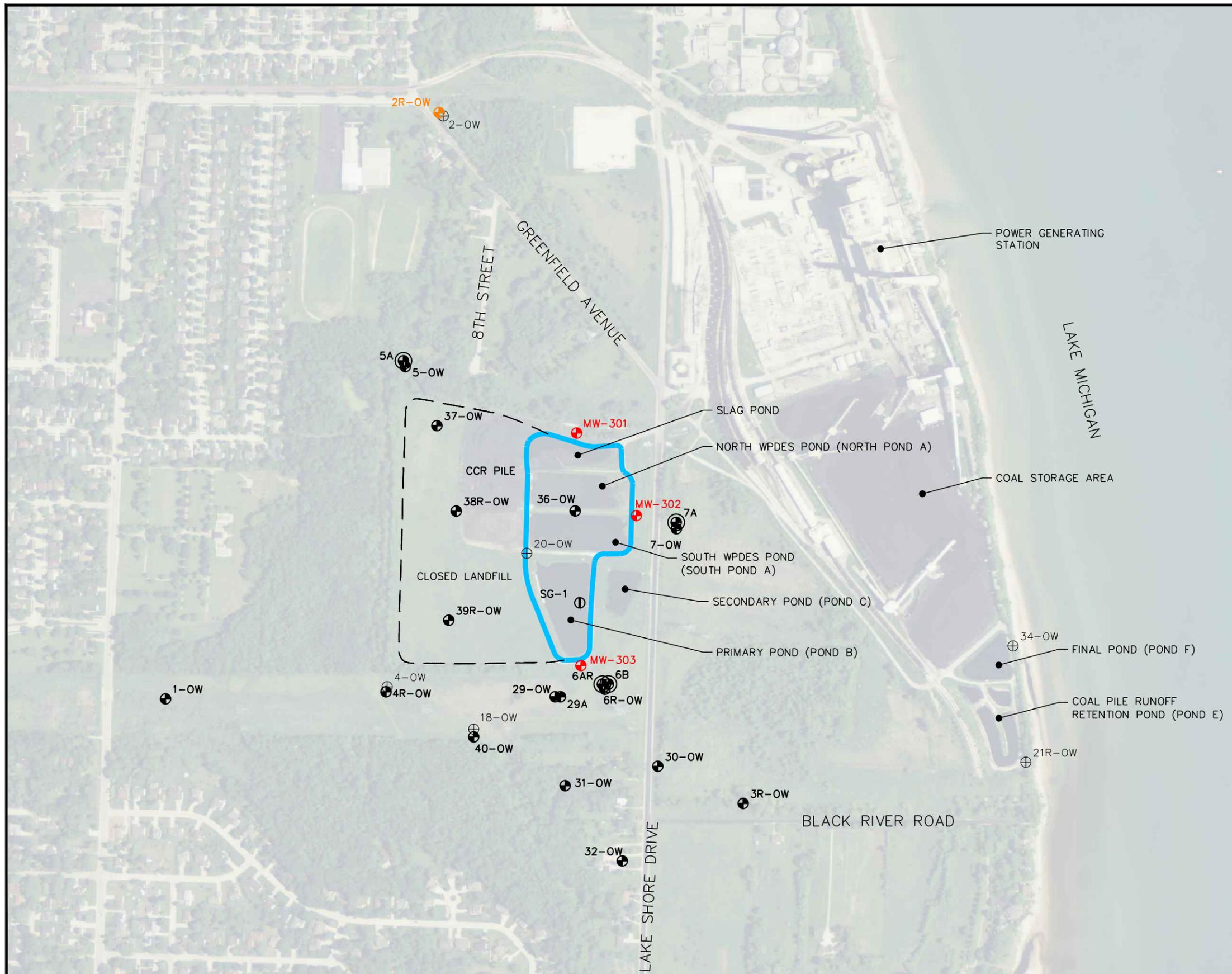
**SITE LOCATION**



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	ALLIANT ENERGY EDGEWATER GENERATING STATION SHEBOYGAN, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25220068.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	11/20/19	CHECKED BY:	MDB	APPROVED BY:	TK 04/10/2020			
REVISED:	11/20/19							

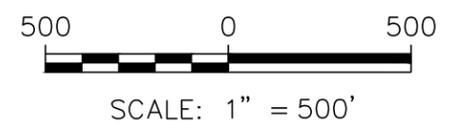


LEGEND

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

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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.



PROJECT NO.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/09/2020	APPROVED BY:	TK 1/28/2021

**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  
 ALLIANT ENERGY  
 EDGEWATER GENERATING STATION  
 SHEBOYGAN, WI

SITE PLAN AND MONITORING WELL LOCATIONS

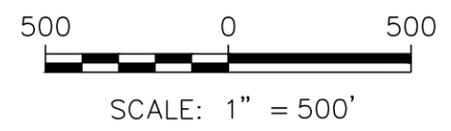
FIGURE  
 2



LEGEND

	ABANDONED MONITORING WELL
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
	MONITORING WELL
	PIEZOMETER
	CCR UNITS
	CLOSED LANDFILL LIMITS
	DESIGN MANAGEMENT ZONE
<b>598.54</b>	WATER TABLE ELEVATION (APRIL 8-9, 2020)
	WATER TABLE CONTOUR (5' INTERVAL)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

- NOTES:
1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
  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 WDRN-APPROVED SITE-SPECIFIC MONITORING PLAN
  6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON APRIL 8 AND 9, 2020.
  7. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER 1-4 (CLOSED) ASH DISPOSAL FACILITY IS 2R-OW.



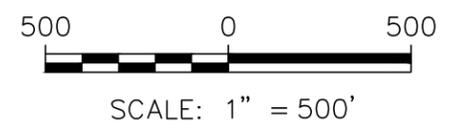
PROJECT NO. 25220068.00	DRAWN BY: KP/ZW	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT WISCONSIN POWER AND LIGHT EDGEWATER GENERATING STATION 3739 LAKESHORE DRIVE SHEBOYGAN, WI 53081	SITE EDGEWATER 1-4 (CLOSED) ASH DISPOSAL FACILITY SHEBOYGAN, WISCONSIN	WATER TABLE MAP APRIL 2020	FIGURE
DRAWN: 02/10/2020	CHECKED BY: NDK					3
REVISED: 08/26/2020	APPROVED BY: SCC 09/25/2020					





LEGEND	
	ABANDONED MONITORING WELL
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
	MONITORING WELL
	PIEZOMETER
	CCR UNITS
	CLOSED LANDFILL LIMITS
	DESIGN MANAGEMENT ZONE
<b>598.54</b>	WATER TABLE ELEVATION (OCTOBER 14-15, 2020)
	WATER TABLE CONTOUR (5' INTERVAL)
	APPROXIMATE GROUNDWATER FLOW DIRECTION

- NOTES:
1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
  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 WDRN-APPROVED SITE-SPECIFIC MONITORING PLAN
  6. GROUNDWATER ELEVATIONS COLLECTED FROM MONITORING WELLS ON OCTOBER 14-15, 2020.
  7. THE BACKGROUND MONITORING WELL FOR THE EDGEWATER 1-4 (CLOSED) ASH DISPOSAL FACILITY IS 2R-OW.



PROJECT NO.	25220068.00	DRAWN BY:	KP/ZW
DRAWN:	02/10/2020	CHECKED BY:	TK
REVISED:	01/15/2021	APPROVED BY:	TK 1/15/2021

**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 2020

FIGURE  
 3

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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**

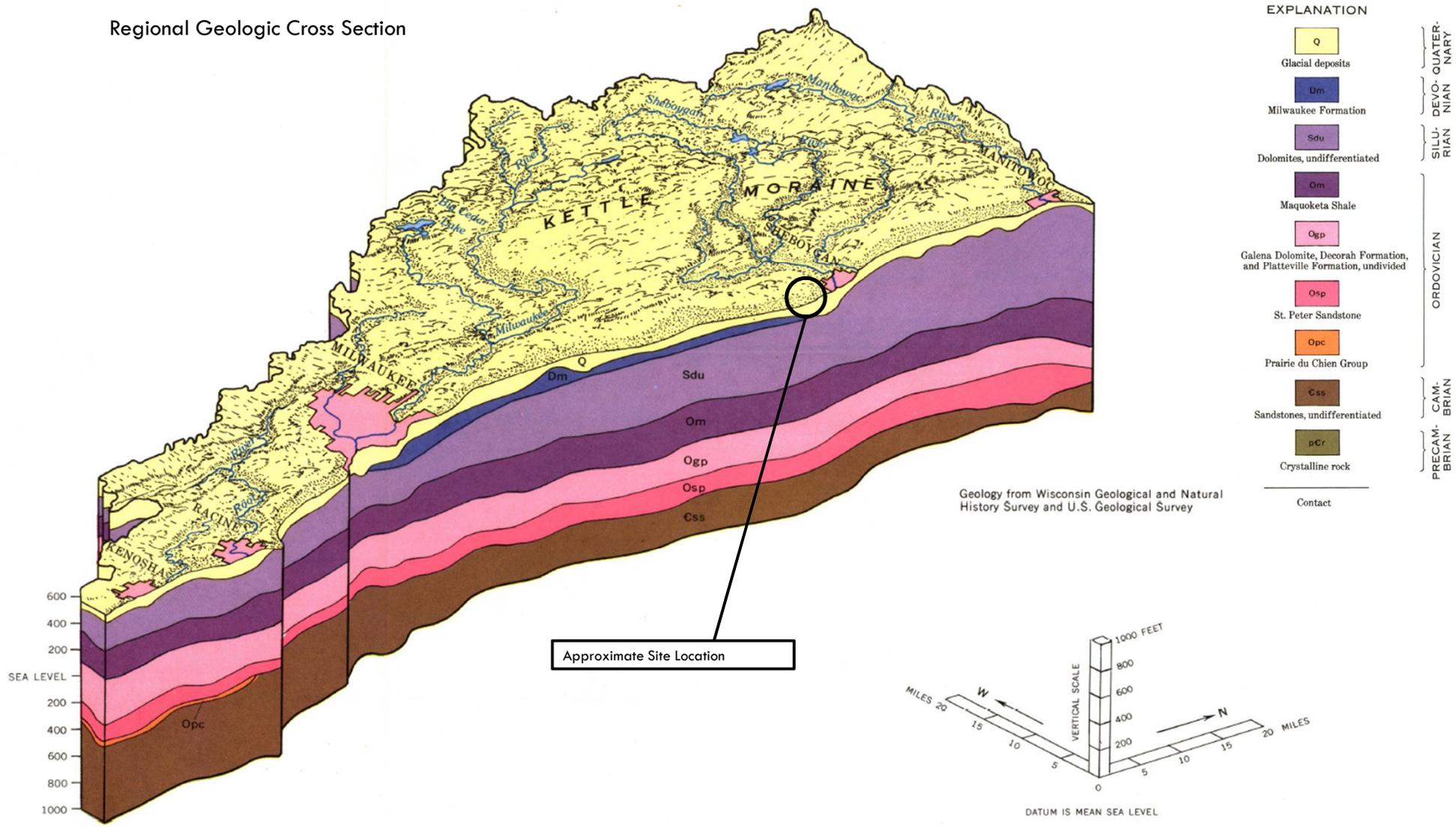
Age	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Predominant Lithology
Quaternary	Sand and Gravel Aquifer	0 to 235	Surface sand and gravel	Sand and Gravel
		0 to 300	Buried sand and gravel	
Devonian	Niagara Dolomite Aquifer	0 to 750	Dolomite (undifferentiated)	Dolomite
Silurian				
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.

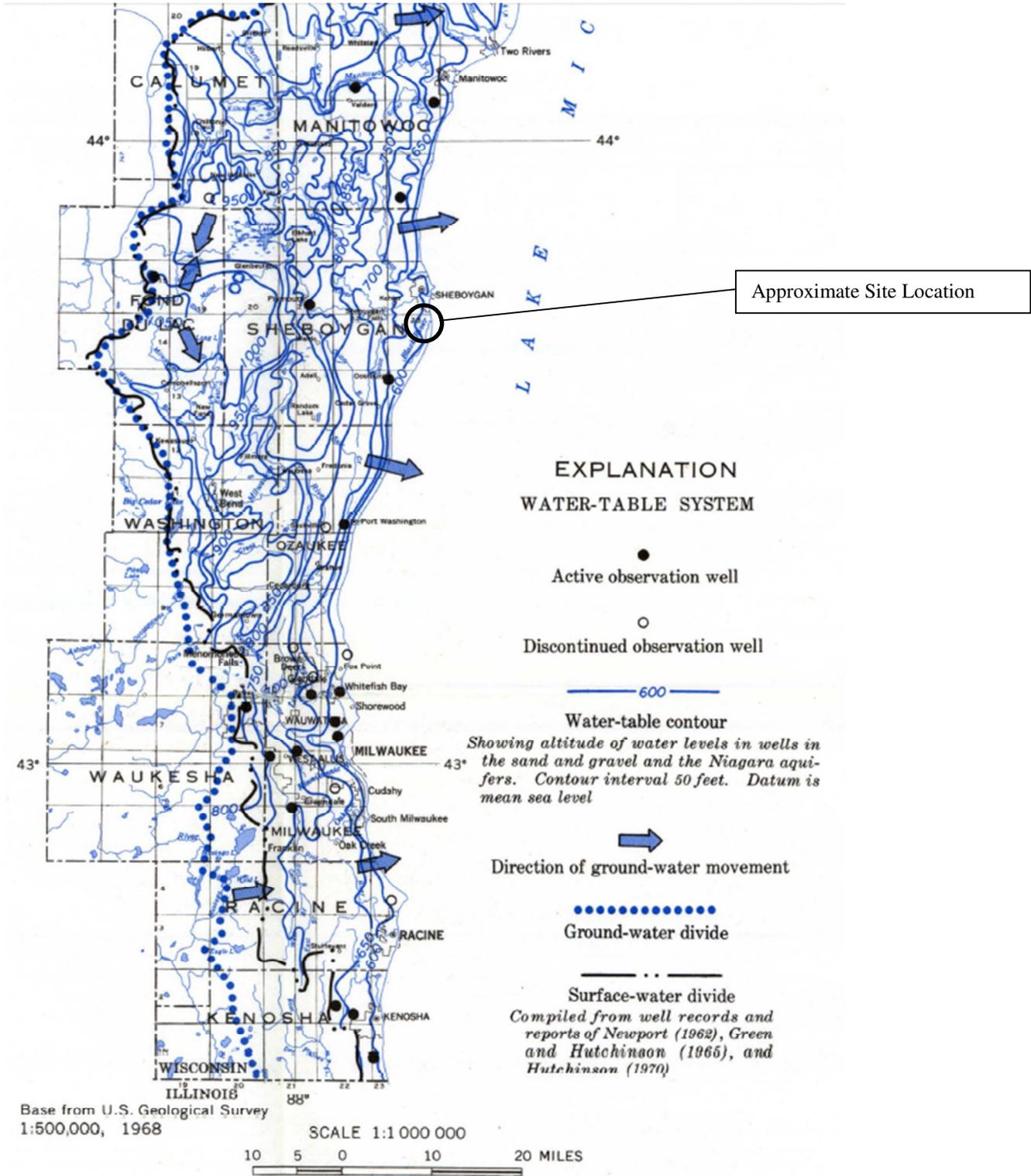
I:\25215053\Reports\Report 6 - EGS\Tables\Table\_2\_Regional\_Hydrogeologic\_Stratigraphy\_I43.doc

# 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

Facility/Project Name <b>Monitoring Well Installation</b>			License/Permit/Monitoring Number <b>02524</b>		Boring Number <b>2R-OW</b>	
Boring Drilled By (Firm name and name of crew chief) <b>M&amp;K Environmental Drilling, Chief Driller Michael McCardle.</b>			Date Drilling Started <b>04/29/98</b>		Date Drilling Completed <b>04/29/98</b>	
DNR Facility Well No.			WI Unique Well No.		Common Well Name	
Final Static Water Level <b>607.2 Feet MSL</b>			Surface Elevation <b>610.3 Feet MSL</b>		Borehole Diameter <b>8.0 Inches</b>	
Boring Location <b>NW 1/4 of NE 1/4 of Section 2 T 14 N.R 23E</b>			Lat <b>0 0 "</b> Long <b>0 0 "</b>		Local Grid Location (If applicable) <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W <b>1772 Feet 1600 Feet</b>	
County <b>SHEBOYGAN</b>			DNR County Code <b>60</b>		Civil Town/City/ or Village <b>SHEBOYGAN</b>	

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

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

Facility/Project Name WPL-Edgewater Generating Station SCS#: 25215135.10			License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State			Date Drilling Started 1/14/2016		Date Drilling Completed 1/14/2016	
WI Unique Well No. VV862		DNR Well ID No.	Common Well Name MW-301	Final Static Water Level 13.7 Feet		Surface Elevation 601.95 Feet
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> 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 _____ ' _____ "		Local Grid Location		Borehole Diameter 8.5 in.
Facility ID		County Shawano	County Code 59	Civil Town/City/ or Village 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					RQD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	Boring already cleared to 8' bgs by hydrovac.											
			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.
S1	22	5 7 9 13	8	SILTY CLAY, brown (7.5YR 4/6).	CL-ML				3.5	M					water @ 11.9 ft bgs after sitting an hour with augers at 20 ft bgs.
S2	20	7 13 23 21	14	SANDY SILT, grey brown (10YR 4/2).	ML				2.75	W					

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

Signature <i>Joe Larson</i>	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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.



Boring Number **MW-301**

Use only as an attachment to Form 4400-122.

Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16	SANDY SILT, grey brown.										
S3	20	57 18 13	19											
			20	Same as above, except brown (7.5 YR 4/6).										
S4	22	22 34	24											
S5	20	33 49	26		ML									
S6	24	22 22	29											
S7	24	22 48	31											
S8	16	23 45	33											
S9	24	22 22	35											
			36	CLAY, grey (7.5YR 4/6). End of boring at 36 ft bgs.	CL									
								1.0	M					water at 16.8 ft bgs with augers at 34 ft bgs.

screen 20-25 ft  
bgs.

water at 16.8 ft  
bgs with augers  
at 34 ft bgs.

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

Facility/Project Name WPL-Edgewater Generating Station SCS#: 25215135.10		License/Permit/Monitoring Number		Boring Number MW-302	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State		Date Drilling Started 1/15/2016		Date Drilling Completed 1/15/2016	
WI Unique Well No. VV861		DNR Well ID No.		Common Well Name MW-302	
Final Static Water Level Feet		Surface Elevation 612.65 Feet		Borehole Diameter 8.5 in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 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 _____ ° _____ ' _____ "		Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> S	
Facility ID		County Shawano		County Code 59	
				Civil Town/City/ or Village Sheboygan	

Sample			Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Blow Counts							Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	Boring already cleared to 8' bgs by hydrovac.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
S1	16	68 11 10	9	SANDY CLAY, various colors (fill).					2.5/1.75	M				
			10											
			11											
			12											
			13											
S2	16	56 11 19	14		CL				3.5	M				
			15											

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

Signature <i>John Larson</i> 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-302**

Use only as an attachment to Form 4400-122.

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

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	16	67 9 12	16	SANDY CLAY, (fill).  CLAY, dark brown, some gravel and fill (topsoil).  LEAN CLAY, brown (7.5YR 4/6).	CL				3.25	M				
			17											
			18											
S4	24	47 10 13	19	SANDY SILT, brown (7.5YR 4/6).	CL				2.75	M				
			20											
			21											
S5	24	66 7 8	22	6 inch sandier zone at 35-35.5 ft bgs, soil less cohesive, more water.	ML				1.5	W				
			23											
			24											
S6	12	57 8 8	25	End of boring at 40 ft bgs.										
			26											
			27											
S7	22	22 4 9	28											
			29											
			30											
S8	24	22 4 7	31											
			32											
			33											
S9	24	22 2 4	34											
			35											
			36											
S10	24	22 4 6	37											
			38											
			39											
			40											

water at 17.8 ft  
bgs after well  
installation.

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

Facility/Project Name WPL-Edgewater Generating Station SCS#: 25215135.10		License/Permit/Monitoring Number		Boring Number MW-303	
Boring Drilled By: Name of crew chief (first, last) and Firm Kevin Durst Badger State		Date Drilling Started 2/4/2016		Date Drilling Completed 2/4/2016	
Drilling Method Hollow stem auger					
WI Unique Well No. VV860	DNR Well ID No.	Common Well Name MW-303	Final Static Water Level Feet	Surface Elevation 609.73 Feet	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 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			Local Grid Location Lat _____ ° _____ ' _____ " _____" Long _____ ° _____ ' _____ " _____" Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Shawano	County Code 59	Civil Town/City/ or Village Sheboygan	

Sample			Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)	Blow Counts							Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1-8	Boring already cleared to 8' bgs by hydrovac.										
S1	15	59 9 12	8-9	SANDY LEAN CLAY, yellowish brown (10YR 5/4).					3.0	W				
S2	18	11 11 12 14	13-14	Same as above except, very dark grayish brown (10YR 3/2).	CL				>4.5	W				

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

Signature *[Signature]* for Kyle Kramer 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 used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.



Facility/Project Name <i>WPHL Edgewater Site</i>	Local Grid Location of Well <i>1771.89</i> ft. <input checked="" type="checkbox"/> N. <i>1599.69</i> ft. <input checked="" type="checkbox"/> W.	Well Name <i>2A-OW</i>
Facility License, Permit or Monitoring Number <i>02524</i>	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <i>NE 1/4 of NE 1/4 of Sec. 2, T. 14 N, R. 23</i> <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Date Well Installed <i>4 29 98</i> m m d d y y
Distance Well Is From Waste/Source Boundary ft. _____	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <i>Mike McArto</i> <i>M&amp;K Environmental</i>
Is Well A Point of Enforcement Std. Application? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		

A. Protective pipe, top elevation <i>612.80</i> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <i>612.72</i> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: _____ ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <i>610.3</i> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom _____ ft. MSL or <i>1.0</i> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input checked="" type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Trenie <input checked="" type="checkbox"/> 01 Trenie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	6. Bentonite seal: a. Bentonite granules <input checked="" type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	7. Fine sand material: Manufacturer, product name & mesh size a. <i>Boeger Mine 65-75</i> b. Volume added _____ ft <sup>3</sup>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	8. Filter pack material: Manufacturer, product name and mesh size a. <i>Boeger Mine 65-75</i> b. Volume added _____ ft <sup>3</sup>
Describe _____	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
17. Source of water (attach analysis): _____	10. Screen material: <i>PVC</i> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or <i>1.0</i> ft.	b. Manufacturer <i>Beovack Inc.</i> c. Slot size: <i>0.010</i> in. d. Slotted length: _____ ft.
F. Fine sand, top _____ ft. MSL or <i>3.5</i> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
G. Filter pack, top _____ ft. MSL or <i>3.5</i> ft.	
H. Screen joint, top _____ ft. MSL or <i>4.5</i> ft.	
I. Well bottom _____ ft. MSL or <i>14.5</i> ft.	
J. Filter pack, bottom _____ ft. MSL or <i>14.5</i> ft.	
K. Borehole, bottom _____ ft. MSL or <i>14.5</i> ft.	
L. Borehole, diameter <i>8.0</i> in.	
M. O.D. well casing <i>2.38</i> in.	
N. I.D. well casing <i>2.00</i> in.	

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.

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. <input type="checkbox"/> N. <input type="checkbox"/> E. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name MW-301
Facility License, Permit or Monitoring No. 02524	Local Grid Origin (estimated: <input type="checkbox"/> ) or Well Location <input checked="" type="checkbox"/> Lat. " Long. " or	Wis. Unique Well No. <input type="checkbox"/> DNR Well ID No. <input type="checkbox"/>
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 v v 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 <input checked="" type="checkbox"/> E <input type="checkbox"/> W	Well Installed By: Name (first, last) and Firm Kevin Durst
Distance from Waste/Source _____ ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Badger State Drilling

- 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

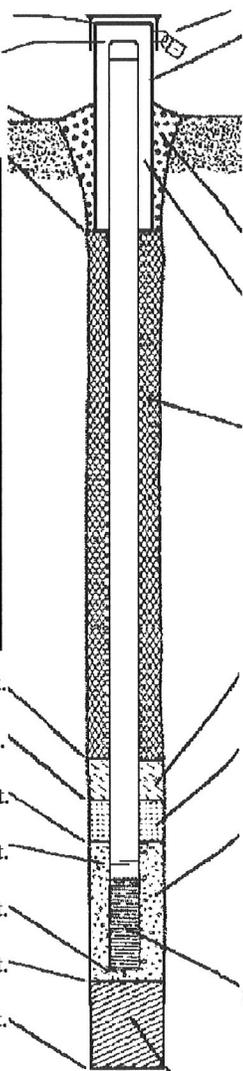
13. Sieve analysis performed?  Yes  No

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

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

16. Drilling additives used?  Yes  No  
 Describe \_\_\_\_\_

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



- 1. Cap and lock?  Yes  No
- 2. Protective cover pipe:
  - a. Inside diameter: 6.0 in.
  - b. Length: 5.0 ft.
  - c. Material: Steel  0 4  
Other
  - d. Additional protection?  Yes  No  
If yes, describe: Steel Posts -3
- 3. Surface seal:
  - Bentonite  3 0
  - Concrete  0 1
  - Other
- 4. Material between well casing and protective pipe:
  - Bentonite  3 0
  - Ohio #5 Sand
  - Other
- 5. Annular space seal:
  - a. Granular/Chipped Bentonite  3 3
  - b. \_\_\_\_\_ Lbs/gal mud weight . . . Bentonite-sand slurry  3 5
  - c. \_\_\_\_\_ Lbs/gal mud weight . . . . . Bentonite slurry  3 1
  - d. \_\_\_\_\_ % Bentonite . . . . . Bentonite-cement grout  5 0
  - e. \_\_\_\_\_ Ft<sup>3</sup> volume added for any of the above
  - f. How installed: Tremie  0 1  
Tremie pumped  0 2  
Gravity  0 8
- 6. Bentonite seal:
  - a. Bentonite granules  3 3
  - b.  1/4 in.  3/8 in.  1/2 in. Bentonite chips  3 2
  - c. \_\_\_\_\_ Other
- 7. Fine sand material: Manufacturer, product name & mesh size
  - a. \_\_\_\_\_ Ohio #7
  - b. Volume added \_\_\_\_\_ 0.5 ft<sup>3</sup>
- 8. Filter pack material: Manufacturer, product name & mesh size
  - a. \_\_\_\_\_ Ohio #5
  - b. Volume added \_\_\_\_\_ 2 ft<sup>3</sup>
- 9. Well casing:
  - Flush threaded PVC schedule 40  2 3
  - Flush threaded PVC schedule 80  2 4
  - Other
- 10. Screen material: 2" dia PVC Sch 40
  - a. Screen type:
    - Factory cut  1 1
    - Continuous slot  0 1
    - Other
  - b. Manufacturer \_\_\_\_\_ Monoflex
  - c. Slot size: 0.010 in.
  - d. Slotted length: 5.0 ft.
- 11. Backfill material (below filter pack):
  - None  1 4
  - 3/8 Bentonite Chips
  - Other

- 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.

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

Signature *[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

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

A. Protective pipe, top elevation 615.35 ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
B. Well casing, top elevation 615.15 ft. MSL	2. Protective cover pipe: a. Inside diameter: <u>6.0</u> in. b. Length: <u>5.0</u> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation 612.65 ft. MSL	d. Additional protection? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: <u>Steel posts</u>
D. Surface seal, bottom <u>612.15</u> ft. MSL or <u>0.5</u> ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input checked="" type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: <u>Ohio #5 Sand</u> Other <input type="checkbox"/>
13. Sieve analysis performed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular/Chipped Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite . . . . . Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed: Tremie <input checked="" type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input checked="" type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite chips <input checked="" type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe _____	7. Fine sand material: Manufacturer, product name & mesh size a. <u>Ohio #7 sand</u> <input type="checkbox"/> b. Volume added <u>0.5</u> ft <sup>3</sup>
17. Source of water (attach analysis, if required): <u>None</u>	8. Filter pack material: Manufacturer, product name & mesh size a. <u>Ohio #5 sand</u> <input type="checkbox"/> b. Volume added <u>2</u> ft <sup>3</sup>
E. Bentonite seal, top <u>612.15</u> ft. MSL or <u>0.5</u> ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
F. Fine sand, top <u>584.15</u> ft. MSL or <u>28.5</u> ft.	10. Screen material: a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 <u>2" dia sch 40 PVC</u> Other <input type="checkbox"/>
G. Filter pack, top <u>582.15</u> ft. MSL or <u>30.5</u> ft.	b. Manufacturer <u>Monoflex</u>
H. Screen joint, top <u>580.15</u> ft. MSL or <u>32.5</u> ft.	c. Slot size: <u>0.010</u> in.
I. Well bottom <u>575.15</u> ft. MSL or <u>37.5</u> ft.	d. Slotted length: <u>5.0</u> ft.
J. Filter pack, bottom <u>572.65</u> ft. MSL or <u>40</u> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
K. Borehole, bottom <u>572.65</u> ft. MSL or <u>40</u> ft.	
L. Borehole, diameter <u>8.5</u> in.	
M. O.D. well casing <u>2.4</u> in.	
N. I.D. well casing <u>2.0</u> in.	

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

Signature [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

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

- 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

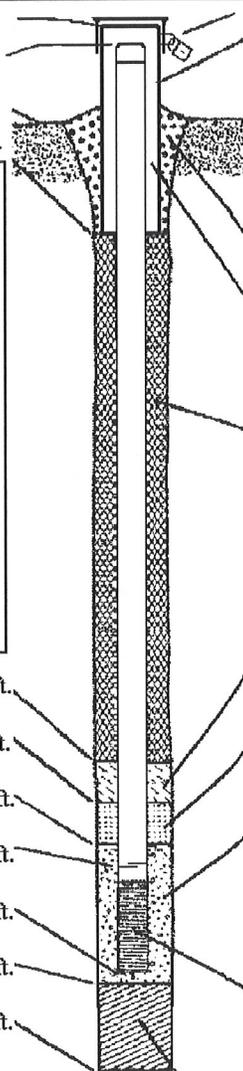
13. Sieve analysis performed?  Yes  No

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

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

16. Drilling additives used?  Yes  No  
 Describe \_\_\_\_\_

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



- 1. Cap and lock?  Yes  No
- 2. Protective cover pipe:
  - a. Inside diameter: \_\_\_\_\_ in.
  - b. Length: \_\_\_\_\_ ft.
  - c. Material: Steel  0 4  
Other
  - d. Additional protection?  Yes  No  
If yes, describe: Steel Posts-3
- 3. Surface seal:
  - Bentonite  3 0
  - Concrete  0 1
  - Other
- 4. Material between well casing and protective pipe:
  - Bentonite  3 0
  - Ohio #5 sand  Other
- 5. Annular space seal:
  - a. Granular/Chipped Bentonite  3 3
  - b. \_\_\_\_\_ Lbs/gal mud weight . . . Bentonite-sand slurry  3 5
  - c. \_\_\_\_\_ Lbs/gal mud weight . . . . . Bentonite slurry  3 1
  - d. \_\_\_\_\_ % Bentonite . . . . . Bentonite-cement grout  5 0
  - e. \_\_\_\_\_ Ft<sup>3</sup> volume added for any of the above
  - f. How installed: Tremie  0 1  
Tremie pumped  0 2  
Gravity  0 8
- 6. Bentonite seal:
  - a. Bentonite granules  3 3
  - b.  1/4 in.  3/8 in.  1/2 in. Bentonite chips  3 2
  - c. \_\_\_\_\_ Other
- 7. Fine sand material: Manufacturer, product name & mesh size  
 a. Ohio #7 sand
- b. Volume added 0.5 ft<sup>3</sup>
- 8. Filter pack material: Manufacturer, product name & mesh size  
 a. Ohio #5
- b. Volume added 1.5 ft<sup>3</sup>
- 9. Well casing: Flush threaded PVC schedule 40  2 3  
 Flush threaded PVC schedule 80  2 4  
 Other
- 10. Screen material: sch PVC 40
  - a. Screen type: Factory cut  1 1  
Continuous slot  0 1  
Other
  - b. Manufacturer Monoflex
  - c. Slot size: 0.010 in.
  - d. Slotted length: 5.0 ft.
- 11. Backfill material (below filter pack): None  1 4  
Other

- 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.

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

Signature [Signature] Bar Kyle Kamer Firm SCS ENGINEERS, 2830 Dairy Drive, Madison, WI 53718-6751

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

Route for: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <i>WPL Edgewater site</i>	County Name <i>Sheboygan</i>	Well Name <i>ZB-0W</i>
Facility License, Permit or Monitoring Number <i>02524</i>	County Code ---	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry?  Yes  No

2. Well development method

surged with bailer and bailed	<input type="checkbox"/>	41
surged with bailer and pumped	<input type="checkbox"/>	61
surged with block and bailed	<input type="checkbox"/>	42
surged with block and pumped	<input type="checkbox"/>	62
surged with block, bailed and pumped	<input type="checkbox"/>	70
compressed air	<input type="checkbox"/>	20
bailed only	<input type="checkbox"/>	10
pumped only	<input checked="" type="checkbox"/>	51
pumped slowly	<input type="checkbox"/>	50
Other	<input type="checkbox"/>	

3. Time spent developing well 90 min.

4. Depth of well (from top of well casing) 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)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>5.57</u> ft.	<u>15.42</u> ft.
Date	b. <u>5/04/98</u> m m d d y y	<u>5/08/98</u> m m d d y y
Time	c. <u>11:05</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<u>10:45</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	<u>0.5</u> inches	<u>0.0</u> inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe)	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. 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	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>Brian Leitcham</u>	Signature: <u>[Signature]</u>
Firm: <u>Miller Engineers + Scientists</u>	Print Initials: <u>BSL</u>
	Firm: <u>Miller Engineers + Scientists</u>

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

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

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

1. Can this well be purged dry?  Yes  No

2. Well development method

surged with bailer and bailed	<input type="checkbox"/> 4 1
surged with bailer and pumped	<input type="checkbox"/> 6 1
surged with block and bailed	<input type="checkbox"/> 4 2
surged with block and pumped	<input type="checkbox"/> 6 2
surged with block, bailed and pumped	<input checked="" type="checkbox"/> 7 0
compressed air	<input type="checkbox"/> 2 0
bailed only	<input type="checkbox"/> 1 0
pumped only	<input type="checkbox"/> 5 1
pumped slowly	<input type="checkbox"/> 5 0
Other _____	<input type="checkbox"/> _____

3. Time spent developing well \_\_\_\_\_ 60 min.

4. Depth of well (from top of well casing) \_\_\_\_\_ 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?  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 5.23 ft.	_____ 27.62 ft.
Date	b. <u>2</u> / <u>15</u> / <u>2016</u>	<u>3</u> / <u>7</u> / <u>2016</u>
Time	c. _____ 12:00 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	_____ 10:40 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ 0 inches	_____ 0 inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 (Describe) _____	Clear <input type="checkbox"/> 2 0 Turbid <input checked="" type="checkbox"/> 2 5 (Describe) _____
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l
16. Well developed by: Name (first, last) and Firm		
First Name: 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: Sheboygan, WI 53081

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

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.

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

Facility/Project Name WPL-Edgewater Generating Station	County Name Sheboygan	Well Name MW-302	
Facility License, Permit or Monitoring Number FID 460021980, License #02524	County Code 59	Wis. Unique Well Number VV861	DNR Well ID Number _____

1. Can this well be purged dry?  Yes  No

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

3. Time spent developing well \_\_\_\_\_ 150 min.

4. Depth of well (from top of well casing) \_\_\_\_\_ 36.15 ft.

5. Inside diameter of well \_\_\_\_\_ 2.0 in.

6. Volume of water in filter pack and well casing \_\_\_\_\_ 9.6 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)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 19.14 ft.	_____ ft.
Date	b. _____ 2 / 15 / 2016	_____ 2 / 15 / 2016
Time	c. _____ 1 : 35 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	_____ 4 : 05 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 1 0 Turbid <input checked="" type="checkbox"/> 1 5 (Describe) _____	Clear <input type="checkbox"/> 2 0 Turbid <input checked="" type="checkbox"/> 2 5 (Describe) _____

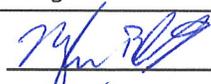
Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids \_\_\_\_\_ mg/l \_\_\_\_\_ mg/l

15. COD \_\_\_\_\_ mg/l \_\_\_\_\_ mg/l

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

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: Sheboygan, WI 53081

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

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

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

1. Can this well be purged dry?  Yes  No

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

3. Time spent developing well \_\_\_\_\_ 70 min.

4. Depth of well (from top of well casing) \_\_\_\_\_ 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?  Yes  No  
(If yes, attach results)

17. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. _____ 23 . _____ 41 ft.	_____ 33 . _____ 1 ft.
Date	b. _____ 2 / _____ 4 / _____ 2016	_____ 3 / _____ 7 / _____ 2016
	m m d d y y y y	m m d d y y y y
Time	c. _____ 1 : 00 <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	_____ 10 : 15 <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.

12. Sediment in well \_\_\_\_\_ inches bottom \_\_\_\_\_ inches

13. Water clarity Clear  1 0 Turbid  1 5 (Describe) \_\_\_\_\_

Clear  2 0 Turbid  2 5 (Describe) \_\_\_\_\_

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

14. Total suspended \_\_\_\_\_ mg/l \_\_\_\_\_ mg/l solids

15. COD \_\_\_\_\_ mg/l \_\_\_\_\_ mg/l

16. Well developed by: Name (first, last) and Firm

First Name: Kyle Last Name: Kramer

Firm: SCS ENGINEERS

Name and Address of Facility Contact /Owner/Responsible Party

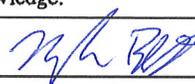
First Name: Jim Last Name: Jakubiak

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: 

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

- C1 April 2020 Assessment Monitoring
- C2 June Resample
- C3 October 2020 Assessment Monitoring

## C1 April 2020 Assessment Monitoring

April 24, 2020

Meghan Blodgett  
SCS ENGINEERS  
2830 Dairy Drive  
Madison, WI 53718

RE: Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

Dear Meghan Blodgett:

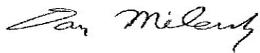
Enclosed are the analytical results for sample(s) received by the laboratory on April 10, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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: Tom Karwoski, SCS ENGINEERS  
Nicole Kron, SCS ENGINEERS  
Jeff Maxted, ALLIANT ENERGY  
Marc Morandi, ALLIANT ENERGY



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

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### **Pace Analytical Services Green Bay**

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40206073001	MW301	Water	04/08/20 14:20	04/10/20 08:55
40206073002	MW302	Water	04/08/20 13:40	04/10/20 08:55
40206073003	MW303	Water	04/08/20 13:00	04/10/20 08:55
40206073004	2ROW	Water	04/08/20 15:10	04/10/20 08:55
40206073005	FIELD BLANK	Water	04/08/20 13:45	04/10/20 08:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40206073001	MW301	EPA 6020	KXS	2
			HMG	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40206073002	MW302	EPA 6020	KXS	2
			HMG	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40206073003	MW303	EPA 6020	KXS	2
			HMG	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40206073004	2R0W	EPA 6020	KXS	2
			HMG	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40206073005	FIELD BLANK	EPA 6020	KXS	2
			SM 2540C	HNT
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

**Sample: MW301**      **Lab ID: 40206073001**      Collected: 04/08/20 14:20      Received: 04/10/20 08:55      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Boron	<b>7450</b>	ug/L	100	30.3	10	04/12/20 22:16	04/17/20 12:23	7440-42-8	
Calcium	<b>80800</b>	ug/L	254	76.2	1	04/12/20 22:16	04/17/20 12:10	7440-70-2	
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	<b>7.82</b>	Std. Units			1		04/08/20 14:20		
Field Specific Conductance	<b>977</b>	umhos/cm			1		04/08/20 14:20		
Oxygen, Dissolved	<b>6.9</b>	mg/L			1		04/08/20 14:20	7782-44-7	
REDOX	<b>17.1</b>	mV			1		04/08/20 14:20		
Turbidity	<b>37.12</b>	NTU			1		04/08/20 14:20		
Static Water Level	<b>599.17</b>	feet			1		04/08/20 14:20		
Temperature, Water (C)	<b>8.5</b>	deg C			1		04/08/20 14:20		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	<b>718</b>	mg/L	20.0	8.7	1		04/13/20 17:27		
<b>9040 pH</b>									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	<b>7.9</b>	Std. Units	0.10	0.010	1		04/13/20 09:39		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	<b>12.5</b>	mg/L	2.0	0.43	1		04/16/20 17:43	16887-00-6	
Fluoride	<b>0.39</b>	mg/L	0.32	0.095	1		04/16/20 17:43	16984-48-8	M0
Sulfate	<b>298</b>	mg/L	20.0	4.4	10		04/17/20 10:38	14808-79-8	

**Sample: MW302**      **Lab ID: 40206073002**      Collected: 04/08/20 13:40      Received: 04/10/20 08:55      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Boron	<b>1570</b>	ug/L	10.0	3.0	1	04/12/20 22:16	04/17/20 12:51	7440-42-8	
Calcium	<b>66800</b>	ug/L	254	76.2	1	04/12/20 22:16	04/17/20 12:51	7440-70-2	
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	<b>7.56</b>	Std. Units			1		04/08/20 13:40		
Field Specific Conductance	<b>476</b>	umhos/cm			1		04/08/20 13:40		
Oxygen, Dissolved	<b>0.4</b>	mg/L			1		04/08/20 13:40	7782-44-7	
REDOX	<b>-107.6</b>	mV			1		04/08/20 13:40		
Turbidity	<b>69.22</b>	NTU			1		04/08/20 13:40		

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

Sample: MW302 Lab ID: 40206073002 Collected: 04/08/20 13:40 Received: 04/10/20 08:55 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Static Water Level	595.33	feet			1		04/08/20 13:40		
Temperature, Water (C)	11.3	deg C			1		04/08/20 13:40		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	316	mg/L	20.0	8.7	1		04/13/20 17:27		
<b>9040 pH</b>									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.8	Std. Units	0.10	0.010	1		04/13/20 09:40		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	19.2	mg/L	2.0	0.43	1		04/16/20 18:27	16887-00-6	
Fluoride	0.97	mg/L	0.32	0.095	1		04/16/20 18:27	16984-48-8	
Sulfate	65.3	mg/L	10.0	2.2	5		04/17/20 11:22	14808-79-8	

Sample: MW303 Lab ID: 40206073003 Collected: 04/08/20 13:00 Received: 04/10/20 08:55 Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Boron	3380	ug/L	10.0	3.0	1	04/12/20 22:16	04/17/20 12:57	7440-42-8	
Calcium	144000	ug/L	254	76.2	1	04/12/20 22:16	04/17/20 12:57	7440-70-2	
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	6.70	Std. Units			1		04/08/20 13:00		
Field Specific Conductance	1241	umhos/cm			1		04/08/20 13:00		
Oxygen, Dissolved	0.2	mg/L			1		04/08/20 13:00	7782-44-7	
REDOX	-102.9	mV			1		04/08/20 13:00		
Turbidity	87.60	NTU			1		04/08/20 13:00		
Static Water Level	588.66	feet			1		04/08/20 13:00		
Temperature, Water (C)	10.0	deg C			1		04/08/20 13:00		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	692	mg/L	20.0	8.7	1		04/13/20 17:28		

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

Sample: MW303      Lab ID: 40206073003      Collected: 04/08/20 13:00      Received: 04/10/20 08:55      Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>9040 pH</b>									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.8	Std. Units	0.10	0.010	1		04/13/20 09:42		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	23.5	mg/L	10.0	2.2	5		04/16/20 19:27	16887-00-6	
Fluoride	<0.48	mg/L	1.6	0.48	5		04/16/20 19:27	16984-48-8	D3
Sulfate	<2.2	mg/L	10.0	2.2	5		04/16/20 19:27	14808-79-8	D3

Sample: 2R0W      Lab ID: 40206073004      Collected: 04/08/20 15:10      Received: 04/10/20 08:55      Matrix: Water									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Boron	52.3	ug/L	10.0	3.0	1	04/12/20 22:16	04/17/20 13:04	7440-42-8	
Calcium	117000	ug/L	254	76.2	1	04/12/20 22:16	04/17/20 13:04	7440-70-2	
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	7.08	Std. Units			1		04/08/20 15:10		
Field Specific Conductance	1081	umhos/cm			1		04/08/20 15:10		
Oxygen, Dissolved	1.5	mg/L			1		04/08/20 15:10	7782-44-7	
REDOX	43.7	mV			1		04/08/20 15:10		
Turbidity	15.24	NTU			1		04/08/20 15:10		
Static Water Level	608.97	feet			1		04/08/20 15:10		
Temperature, Water (C)	6.1	deg C			1		04/08/20 15:10		
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	604	mg/L	20.0	8.7	1		04/13/20 17:28		
<b>9040 pH</b>									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	7.1	Std. Units	0.10	0.010	1		04/13/20 09:44		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	67.5	mg/L	10.0	2.2	5		04/17/20 11:37	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		04/16/20 19:41	16984-48-8	
Sulfate	11.6	mg/L	2.0	0.44	1		04/16/20 19:41	14808-79-8	

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### ANALYTICAL RESULTS

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

**Sample: FIELD BLANK**      **Lab ID: 40206073005**      Collected: 04/08/20 13:45      Received: 04/10/20 08:55      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020    Preparation Method: EPA 3010									
Pace Analytical Services - Green Bay									
Boron	<3.0	ug/L	10.0	3.0	1	04/12/20 22:16	04/16/20 14:23	7440-42-8	
Calcium	<76.2	ug/L	254	76.2	1	04/12/20 22:16	04/16/20 14:23	7440-70-2	
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C									
Pace Analytical Services - Green Bay									
Total Dissolved Solids	10.0J	mg/L	20.0	8.7	1		04/13/20 17:28		
<b>9040 pH</b>									
Analytical Method: EPA 9040									
Pace Analytical Services - Green Bay									
pH at 25 Degrees C	6.2	Std. Units	0.10	0.010	1		04/13/20 09:49		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0									
Pace Analytical Services - Green Bay									
Chloride	<0.43	mg/L	2.0	0.43	1		04/16/20 19:56	16887-00-6	
Fluoride	<0.095	mg/L	0.32	0.095	1		04/16/20 19:56	16984-48-8	
Sulfate	<0.44	mg/L	2.0	0.44	1		04/16/20 19:56	14808-79-8	

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### QUALITY CONTROL DATA

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

QC Batch: 352275 Analysis Method: EPA 6020  
QC Batch Method: EPA 3010 Analysis Description: 6020 MET  
Laboratory: Pace Analytical Services - Green Bay  
Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

METHOD BLANK: 2039942 Matrix: Water  
Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	04/16/20 14:16	
Calcium	ug/L	<76.2	254	04/16/20 14:16	

LABORATORY CONTROL SAMPLE: 2039943

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	469	94	80-120	
Calcium	ug/L	5000	5100	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2039944 2039945

Parameter	Units	40206073006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	65.8	500	500	538	535	95	94	75-125	1	20	
Calcium	ug/L	88800	5000	5000	91900	94800	62	118	75-125	3	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.

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### QUALITY CONTROL DATA

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

QC Batch: 352371 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Laboratory: Pace Analytical Services - Green Bay  
Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

METHOD BLANK: 2040332 Matrix: Water  
Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	04/13/20 17:22	

LABORATORY CONTROL SAMPLE: 2040333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	549	558	102	80-120	

SAMPLE DUPLICATE: 2040334

Parameter	Units	40206049001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	646	684	6	10	

SAMPLE DUPLICATE: 2040335

Parameter	Units	40206073001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	718	696	3	10	

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### QUALITY CONTROL DATA

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

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QC Batch:	352315	Analysis Method:	EPA 9040
QC Batch Method:	EPA 9040	Analysis Description:	9040 pH
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

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SAMPLE DUPLICATE: 2040062

Parameter	Units	40205757001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	20	H6

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SAMPLE DUPLICATE: 2040063

Parameter	Units	40205948001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.5	1	20	H6

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### QUALITY CONTROL DATA

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

QC Batch: 352599 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: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

METHOD BLANK: 2041158 Matrix: Water  
Associated Lab Samples: 40206073001, 40206073002, 40206073003, 40206073004, 40206073005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	04/16/20 10:24	
Fluoride	mg/L	<0.095	0.32	04/16/20 10:24	
Sulfate	mg/L	<0.44	2.0	04/16/20 10:24	

LABORATORY CONTROL SAMPLE: 2041159

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.3	101	90-110	
Fluoride	mg/L	2	2.0	99	90-110	
Sulfate	mg/L	20	20.1	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2041160 2041161

Parameter	Units	40206062001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	421	400	400	842	834	105	103	90-110	1	15		
Fluoride	mg/L	8.1	40	40	49.5	49.1	103	102	90-110	1	15		
Sulfate	mg/L	20.4J	400	400	461	456	110	109	90-110	1	15		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2041162 2041163

Parameter	Units	40206073001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	12.5	20	20	34.4	34.3	109	109	90-110	0	15		
Fluoride	mg/L	0.39	2	2	2.6	2.6	112	112	90-110	0	15 M0		
Sulfate	mg/L	298	200	200	481	495	92	99	90-110	3	15		

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## QUALIFIERS

Project: 25220068 EDGEWATER CLOSED CCR

Pace Project No.: 40206073

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### 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

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

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

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

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

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25220068 EDGEWATER CLOSED CCR  
Pace Project No.: 40206073

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40206073001	MW301	EPA 3010	352275	EPA 6020	352306
40206073002	MW302	EPA 3010	352275	EPA 6020	352306
40206073003	MW303	EPA 3010	352275	EPA 6020	352306
40206073004	2R0W	EPA 3010	352275	EPA 6020	352306
40206073005	FIELD BLANK	EPA 3010	352275	EPA 6020	352306
40206073001	MW301				
40206073002	MW302				
40206073003	MW303				
40206073004	2R0W				
40206073001	MW301	SM 2540C	352371		
40206073002	MW302	SM 2540C	352371		
40206073003	MW303	SM 2540C	352371		
40206073004	2R0W	SM 2540C	352371		
40206073005	FIELD BLANK	SM 2540C	352371		
40206073001	MW301	EPA 9040	352315		
40206073002	MW302	EPA 9040	352315		
40206073003	MW303	EPA 9040	352315		
40206073004	2R0W	EPA 9040	352315		
40206073005	FIELD BLANK	EPA 9040	352315		
40206073001	MW301	EPA 300.0	352599		
40206073002	MW302	EPA 300.0	352599		
40206073003	MW303	EPA 300.0	352599		
40206073004	2R0W	EPA 300.0	352599		
40206073005	FIELD BLANK	EPA 300.0	352599		

### REPORT OF LABORATORY ANALYSIS

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(Please Print Clearly)

Company Name: *SCS Engineers*  
 Branch/Location: *Madison WI*  
 Project Contact: *Tom Karwaske*  
 Phone: *608 216 7369*  
 Project Number:  
 Project Name: *Edgewater*  
 Project State: *WI*  
 Sampled By (Print): *ZACH WATSON*  
 Sampled By (Sign): *[Signature]*  
 PO #:  
 Regulatory Program:



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

*40006073*

### CHAIN OF CUSTODY

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

FILTERED?  
(YES/NO)  
 PRESERVATION  
(CODE)\*

Y/N	N	N	N	N	N						
Pick Letter	A	A	D	D	D						
Analyses Requested	<i>TDS, Cl, F, SO4</i>	<i>pH</i>	<i>B</i>	<i>Radium 226/226</i>	<i>Meta 15, 1st</i>						

Quote #:  
 Mail To Contact:  
 Mail To Company:  
 Mail To Address:  
 Invoice To Contact:  
 Invoice To Company:  
 Invoice To Address:  
 Invoice To Phone:

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

MS/MSD  
 On your sample (billable)  
 NOT needed on your sample

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

PACE LAB #	CLIENT FIELD ID	COLLECTION		MATRIX
		DATE	TIME	
001	MW301	4-8	1420	GW
002	MW302	4-8	1340	GW
003	MW303	4-8	1300	GW
004	2R 0W	4-8	1510	GW
005	<del>Field</del> Field Blank	4-8	1345	W
006	MW305	4-7	1320	GW
007	Field Blank	4-7	1335	W
008	MW301	4-7	1531	GW
009	MW304	4-7	1216	GW
010	MW303	4-8	930	GW
011	MW302	4-8	1020	GW

CLIENT COMMENTS  
 LAB COMMENTS (Lab Use Only)  
 Profile #

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

Relinquished By: *Zach Watson* Date/Time: *4-8-2020 1730*  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Transmit Prelim Rush Results by (complete what you want):  
 Relinquished By: *CS Rogstad* Date/Time: *4-10-20 0855*  
 Received By: *Susan Wolfe* Date/Time: *4-10-20 0855*

EMAIL #1:  
 EMAIL #2:  
 TELEPHONE:  
 FAX:

Samples on HOLD are subject to special pricing and release of liability

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished By: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

FACE Project No. *40006073*  
 Receipt Temp = *ROT* °C  
 Sample Receipt pH *OK* Adjusted  
 Chain Custody Seal Present/Not Present Intact/Not Intact



 1241 Bellevue Street, Green Bay, WI 54302	Document Name: Sample Condition Upon Receipt (SCUR)	Document Revised: 26Mar2020
	Document No.: ENV-FRM-GBAY-0014-Rev.00	Author: Pace Green Bay Quality Office

### Sample Condition Upon Receipt Form (SCUR)

Client Name: SCS  
 Courier:  CS Logistics  Fed Ex  Speedee  UPS  Waltco  
 Client  Pace Other: \_\_\_\_\_

Project #: **WO# : 40206073**  
  
 40206073

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

Cooler Temperature Uncorr: ROI / Corr: \_\_\_\_\_  
 Temp Blank Present:  yes  no Biological Tissue is Frozen:  yes  no

Person examining contents:  
4-10-20 SL  
 Date: / Initials:  
 Labeled By Initials: \_\_\_\_\_

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	2. <u>No Pg#, Mail, Invoice, Project # 4-10-20</u>
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. <u>SL</u>
Sampler Name & Signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	5.
- VOA Samples frozen upon receipt	<input type="checkbox"/> Yes <input type="checkbox"/> No	Date/Time: _____
Short Hold Time Analysis (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	7.
Sufficient Volume:		8.
For Analysis: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No MS/MSD: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A		
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
-Pace Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
-Pace IR Containers Used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>005-time 1425</u>
-Includes date/time/ID/Analysis Matrix: <u>W</u>		<u>4-10-20</u>
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. <u>SL</u>
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased): _____		

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

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



## C2 June Resample

July 06, 2020

Meghan Blodgett  
SCS ENGINEERS  
2830 Dairy Drive  
Madison, WI 53718

RE: Project: 25220068.00 WPL-EDGEWATER  
Pace Project No.: 40210355

Dear Meghan Blodgett:

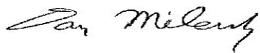
Enclosed are the analytical results for sample(s) received by the laboratory on June 30, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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: Tom Karwoski, SCS ENGINEERS  
Nicole Kron, SCS ENGINEERS  
Jeff Maxted, ALLIANT ENERGY  
Marc Morandi, ALLIANT ENERGY



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

---

### **Pace Analytical Services Green Bay**

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

---

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40210355001	MW-301	Water	06/26/20 14:00	06/30/20 11:40
40210355002	FIELD BLANK	Water	06/26/20 14:05	06/30/20 11:40

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40210355001	MW-301		AXL	7
		EPA 300.0	HMB	1
40210355002	FIELD BLANK	EPA 300.0	HMB	1

PASI-G = Pace Analytical Services - Green Bay

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

**Sample: MW-301**      **Lab ID: 40210355001**      Collected: 06/26/20 14:00      Received: 06/30/20 11:40      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>Field Data</b>									
Analytical Method: Pace Analytical Services - Green Bay									
Field pH	<b>7.53</b>	Std. Units			1		06/26/20 14:00		
Field Specific Conductance	<b>983</b>	umhos/cm			1		06/26/20 14:00		
Oxygen, Dissolved	<b>5.47</b>	mg/L			1		06/26/20 14:00	7782-44-7	
REDOX	<b>49.1</b>	mV			1		06/26/20 14:00		
Turbidity	<b>62.57</b>	NTU			1		06/26/20 14:00		
Static Water Level	<b>597.89</b>	feet			1		06/26/20 14:00		
Temperature, Water (C)	<b>16.8</b>	deg C			1		06/26/20 14:00		
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Fluoride	<b>0.26J</b>	mg/L	0.32	0.095	1		07/01/20 12:54	16984-48-8	M0

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

**Sample: FIELD BLANK**      **Lab ID: 40210355002**      Collected: 06/26/20 14:05      Received: 06/30/20 11:40      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Fluoride	<0.095	mg/L	0.32	0.095	1		07/01/20 13:38	16984-48-8	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 25220068.00 WPL-EDGEWATER  
Pace Project No.: 40210355

QC Batch: 359094      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: 40210355001, 40210355002

METHOD BLANK: 2076786      Matrix: Water  
Associated Lab Samples: 40210355001, 40210355002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.095	0.32	07/01/20 11:54	

LABORATORY CONTROL SAMPLE: 2076787

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2	2.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2076788      2076789

Parameter	Units	2076788		2076789		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		40210355001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Fluoride	mg/L	0.26J	2	2	2.5	2.6	114	116	90-110	1	15 M0

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: 25220068.00 WPL-EDGEWATER

Pace Project No.: 40210355

---

### 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

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

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: 25220068.00 WPL-EDGEWATER  
Pace Project No.: 40210355

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40210355001	MW-301				
40210355001	MW-301	EPA 300.0	359094		
40210355002	FIELD BLANK	EPA 300.0	359094		

**REPORT OF LABORATORY ANALYSIS**

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# Pace Container Order #663400

40210355

Addresses \_\_\_\_\_

**Order By :** \_\_\_\_\_ **Ship To :** \_\_\_\_\_ **Return To :** \_\_\_\_\_

Company SCS ENGINEERS Company SCS ENGINEERS Company Pace Analytical Green Bay  
 Contact Blodgett, Meghan Contact Blodgett, Meghan Contact Milewsky, Dan  
 Email mblodgett@scsengineers.com Email mblodgett@scsengineers.com dan.milewsky@pacelabs.com  
 Address 2830 Dairy Drive Address 2830 Dairy Drive Address 1241 Bellevue Street  
 Address 2 \_\_\_\_\_ Address 2 \_\_\_\_\_ Address 2 Suite 9 \_\_\_\_\_  
 City Madison City Madison City Green Bay  
 State WI Zip 53718 State WI Zip 54302  
 Phone 608-216-7362 Phone 608-216-7362 Phone (920)469-2436

**Info**

**Project Name** Alliant Edgewater Fluoride **Due Date** 06/25/2020 **Profile** 4908 **Quote** \_\_\_\_\_

**Project Manager** Milewsky, Dan **Return Date** \_\_\_\_\_ **Carrier** Most Economical **Location** \_\_\_\_\_

**Trip Blanks**

Include Trip Blanks

**Bottle Labels**

Blank  
 Pre-Printed No Sample IDs  
 Pre-Printed With Sample IDs

**Bottles**

Boxed Cases  
 Individually Wrapped  
 Grouped By Sample ID/Matrix

**Return Shipping Labels**

No Shipper  
 With Shipper

**Misc**

Sampling Instructions  
 Custody Seal  
 Temp. Blanks  
 Coolers  
 Syringes

**Extra Bubble Wrap**  
 Short Hold/Rush Stickers  
 DI Water 1 Liter(s)  
 USDA Regulated Soils

**COC Options**

Number of Blanks \_\_\_\_\_  
 Pre-Printed \_\_\_\_\_

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
2	WT	Fluoride by 300.0	250mL plastic unpres	2	0	M-9-311-06BB	
1	WT	Lab DI Water - 1 liter	1 liter lab DI water	1	0	NA	

## Hazard Shipping Placard In Place : NA

\*Sample receiving hours are typically 8am-5pm, but may differ by location. Please check with your Pace Project Manager.  
 \*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.  
 \*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage/disposal.  
 \*Payment term are net 30 days.  
 \*Please include the proposal number on the chain of custody to insure proper billing.

**LAB USE:**

**Ship Date :** 06/24/2020  
**Prepared By:** Mai Yer Her  
**Verified By:** \_\_\_\_\_

**Sample**

**CLIENT USE (Optional):**

Date Rec'd: \_\_\_\_\_  
 Received By: \_\_\_\_\_  
 Verified By: \_\_\_\_\_



 1241 Bellevue Street, Green Bay, WI 54302	Document Name: <b>Sample Condition Upon Receipt (SCUR)</b>	Document Revised: 26Mar2020
	Document No.: <b>ENV-FRM-GBAY-0014-Rev.00</b>	Author: Pace Green Bay Quality Office

**Sample Condition Upon Receipt Form (SCUR)**

Client Name: SCS Project #: \_\_\_\_\_

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

Tracking #: 1483062920

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

**WO#: 40210355**



Packing Material:  Bubble Wrap  Bubble Bags  None  Other

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

Cooler Temperature Uncorr: RET Corr: \_\_\_\_\_

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

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

Person examining contents:  
 Date: 1/30/20 Initials: SMW  
 Labeled By Initials: SMW

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

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_



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

## SAMPLE ACKNOWLEDGMENT

**Samples Submitted By:** SCS ENGINEERS  
**Client Project ID:** 25220068.00 WPL-EDGEWATER  
**Client PO#:**

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

**Pace Analytical Project ID:** 40210355  
**Samples Received:** June 30, 2020 11:40 AM  
**Estimated Completion:** July 02, 2020

**CC:** Meghan Blodgett, Nicole Kron  
**Client Specified QC Sample(s):** MW-301

Customer Sample ID	Pace Analytical Lab ID	Matrix	Date/Time Collected	Method
MW-301	40210355001	Water	06/26/20 14:00	300.0 IC Anions Field Data
TB-1	40210355002	Water	06/26/20 14:05	300.0 IC Anions

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Confidentiality Statement: The Parties agree that they will take all reasonable precautions to prevent the unauthorized disclosure of any proprietary or confidential information of each other and that they will not disclose such information except to those employees, subcontractors, or agents who have expressly agreed to maintain confidentiality.

Thank you for choosing Pace Analytical Services, LLC.

## SAMPLE ACKNOWLEDGMENT

### Analyte List

Customer Sample ID	Method	Compound	Reporting	
			Limit	Units
MW-301	300.0 IC Anions Field Data	Fluoride	0.316	mg/L
		Collected By		no units
		Collected Date		no units
		Collected Time		no units
		Field pH		Std. Units
		Field Temperature		deg C
		Appearance		no units
		Field Specific Conductance		umhos/cm
		Field Oxidation Potential		mV
		Oxygen, Dissolved		mg/L
		Field Residual Chlorine		no units
		REDOX		mV
		Turbidity		NTU
		Chlorine, Total Residual		mg/L
		Salinity ppt		mg/L
		Chlorine, Free		mg/L
		Static Water Level		feet
		Apparent Color		no units
		Odor		no units
		Barometric Pressure (mm Hg)		no units
		CO2 Volume		%
		Methane Volume		%
		Oxygen Volume		%
		Pressure Trend		no units
		Gas Flow Rate		no units
		Header Pressure		no units
		Elevation Water Level		feet
		Methane Volume Dissolved Gases		%
		Methane Volume LEL		%
		Field Temperature, C		deg C
		Field Temperature, F		deg F
		Volume Leachate (Pumped)		Kgallons
		Leachate Head Elevation		feet
		Leachate Depth		feet
		Depth to Groundwater		feet
		Laboratory Temperature, C		deg C
		Temperature, Water (C)		deg C
		Temperature, Air (F)		deg F
		Temperature, Gas (F)		deg F
		Temperature, Soil (F)		deg F
		Flow Rate		deg F
Well Frozen		no units		
Well Broken		no units		
Well Dry		no units		
Balance Gases		%		
Well Pressure		no units		
Well Vacuum		no units		
Valve Position		%		
Well Obstructed		%		
TB-1	300.0 IC Anions	Lysimeter Discharge		no units
		Fluoride	0.316	mg/L

Please contact your project manager if you recognize any discrepancy in this form or have any questions about your project.

Thank you for choosing Pace Analytical Services, LLC.



## C3 October 2020 Assessment Monitoring

November 04, 2020

Meghan Blodgett  
SCS ENGINEERS  
2830 Dairy Drive  
Madison, WI 53718

RE: Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

Dear Meghan Blodgett:

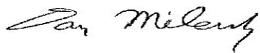
Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise 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: Tom Karwoski, SCS ENGINEERS  
Nicole Kron, SCS ENGINEERS  
Jeff Maxted, ALLIANT ENERGY  
Marc Morandi, ALLIANT ENERGY



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

---

### **Pace Analytical Services Green Bay**

1241 Bellevue Street, Green Bay, WI 54302

Florida/NELAP Certification #: E87948

Illinois Certification #: 200050

Kentucky UST Certification #: 82

Louisiana Certification #: 04168

Minnesota Certification #: 055-999-334

New York Certification #: 12064

North Dakota Certification #: R-150

Virginia VELAP ID: 460263

South Carolina Certification #: 83006001

Texas Certification #: T104704529-14-1

Wisconsin Certification #: 405132750

Wisconsin DATCP Certification #: 105-444

USDA Soil Permit #: P330-16-00157

Federal Fish & Wildlife Permit #: LE51774A-0

---

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

Lab ID	Sample ID	Matrix	Date Collected	Date Received
40216742001	MW-301	Water	10/15/20 14:00	10/17/20 09:05
40216742002	MW-302	Water	10/15/20 13:20	10/17/20 09:05
40216742003	MW-303	Water	10/15/20 12:30	10/17/20 09:05
40216742004	FIELD BLANK	Water	10/15/20 14:05	10/17/20 09:05
40216742005	2R-OW	Water	10/15/20 14:30	10/17/20 09:05

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

Lab ID	Sample ID	Method	Analysts	Analytes Reported
40216742001	MW-301	EPA 6020	KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40216742002	MW-302	EPA 6020	DS1, KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40216742003	MW-303	EPA 6020	DS1, KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40216742004	FIELD BLANK	EPA 6020	KXS	2
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3
40216742005	2R-OW	EPA 6020	DS1, KXS	2
			VGC	7
		SM 2540C	HNT	1
		EPA 9040	ALY	1
		EPA 300.0	HMB	3

PASI-G = Pace Analytical Services - Green Bay

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

**Sample: MW-301**      **Lab ID: 40216742001**      Collected: 10/15/20 14:00      Received: 10/17/20 09:05      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay							
Boron	<b>6550</b>	ug/L	200	60.6	20	10/20/20 07:54	10/23/20 23:53	7440-42-8	SD
Calcium	<b>114000</b>	ug/L	508	152	2	10/20/20 07:54	10/22/20 19:29	7440-70-2	
<b>Field Data</b>		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	<b>7.64</b>	Std. Units			1		10/15/20 14:00		
Field Specific Conductance	<b>996</b>	umhos/cm			1		10/15/20 14:00		
Oxygen, Dissolved	<b>0.8</b>	mg/L			1		10/15/20 14:00	7782-44-7	
REDOX	<b>140</b>	mV			1		10/15/20 14:00		
Turbidity	<b>130.0</b>	NTU			1		10/15/20 14:00		
Static Water Level	<b>595.10</b>	feet			1		10/15/20 14:00		
Temperature, Water (C)	<b>11.2</b>	deg C			1		10/15/20 14:00		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	<b>678</b>	mg/L	20.0	8.7	1		10/19/20 17:04		
<b>9040 pH</b>		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	<b>7.6</b>	Std. Units	0.10	0.010	1		10/20/20 08:03		H6
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	<b>13.9</b>	mg/L	10.0	2.2	5		10/28/20 13:59	16887-00-6	
Fluoride	<b>&lt;0.48</b>	mg/L	1.6	0.48	5		10/28/20 13:59	16984-48-8	D3,M0
Sulfate	<b>293</b>	mg/L	40.0	8.9	20		11/02/20 13:12	14808-79-8	

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## ANALYTICAL RESULTS

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

**Sample: MW-302**      **Lab ID: 40216742002**      Collected: 10/15/20 13:20      Received: 10/17/20 09:05      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay							
Boron	<b>1410</b>	ug/L	50.0	15.2	5	10/20/20 07:54	10/26/20 19:07	7440-42-8	
Calcium	<b>124000</b>	ug/L	508	152	2	10/20/20 07:54	10/22/20 19:56	7440-70-2	
<b>Field Data</b>		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	<b>7.90</b>	Std. Units			1		10/15/20 13:20		
Field Specific Conductance	<b>523</b>	umhos/cm			1		10/15/20 13:20		
Oxygen, Dissolved	<b>0.3</b>	mg/L			1		10/15/20 13:20	7782-44-7	
REDOX	<b>-83.0</b>	mV			1		10/15/20 13:20		
Turbidity	<b>161.8</b>	NTU			1		10/15/20 13:20		
Static Water Level	<b>598.56</b>	feet			1		10/15/20 13:20		
Temperature, Water (C)	<b>11.2</b>	deg C			1		10/15/20 13:20		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	<b>182</b>	mg/L	20.0	8.7	1		10/19/20 17:04		
<b>9040 pH</b>		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	<b>7.7</b>	Std. Units	0.10	0.010	1		10/20/20 08:07		H6
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	<b>20.9</b>	mg/L	10.0	2.2	5		10/28/20 14:42	16887-00-6	
Fluoride	<b>1.0J</b>	mg/L	1.6	0.48	5		10/28/20 14:42	16984-48-8	D3
Sulfate	<b>73.1</b>	mg/L	10.0	2.2	5		10/28/20 14:42	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

**Sample: MW-303**      **Lab ID: 40216742003**      Collected: 10/15/20 12:30      Received: 10/17/20 09:05      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay							
Boron	<b>3310</b>	ug/L	100	30.3	10	10/20/20 07:54	10/26/20 19:13	7440-42-8	
Calcium	<b>132000</b>	ug/L	254	76.2	1	10/20/20 07:54	10/22/20 20:03	7440-70-2	
<b>Field Data</b>		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	<b>7.11</b>	Std. Units			1		10/15/20 12:30		
Field Specific Conductance	<b>1123</b>	umhos/cm			1		10/15/20 12:30		
Oxygen, Dissolved	<b>0.2</b>	mg/L			1		10/15/20 12:30	7782-44-7	
REDOX	<b>-32.0</b>	mV			1		10/15/20 12:30		
Turbidity	<b>70.42</b>	NTU			1		10/15/20 12:30		
Static Water Level	<b>593.19</b>	feet			1		10/15/20 12:30		
Temperature, Water (C)	<b>10.9</b>	deg C			1		10/15/20 12:30		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	<b>620</b>	mg/L	20.0	8.7	1		10/19/20 17:05		
<b>9040 pH</b>		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.010	1		10/20/20 08:08		H6
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	<b>20.9</b>	mg/L	10.0	2.2	5		10/28/20 14:56	16887-00-6	
Fluoride	<b>&lt;0.48</b>	mg/L	1.6	0.48	5		10/28/20 14:56	16984-48-8	D3
Sulfate	<b>&lt;2.2</b>	mg/L	10.0	2.2	5		10/28/20 14:56	14808-79-8	D3

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### ANALYTICAL RESULTS

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

**Sample: FIELD BLANK**      **Lab ID: 40216742004**      Collected: 10/15/20 14:05      Received: 10/17/20 09:05      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>									
Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay									
Boron	<b>3.5J</b>	ug/L	10.0	3.0	1	10/20/20 07:54	10/22/20 14:18	7440-42-8	
Calcium	<b>90.8J</b>	ug/L	254	76.2	1	10/20/20 07:54	10/22/20 14:18	7440-70-2	
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C Pace Analytical Services - Green Bay									
Total Dissolved Solids	<b>&lt;8.7</b>	mg/L	20.0	8.7	1		10/19/20 17:05		
<b>9040 pH</b>									
Analytical Method: EPA 9040 Pace Analytical Services - Green Bay									
pH at 25 Degrees C	<b>6.8</b>	Std. Units	0.10	0.010	1		10/20/20 08:10		H6
<b>300.0 IC Anions</b>									
Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay									
Chloride	<b>&lt;0.43</b>	mg/L	2.0	0.43	1		10/28/20 15:25	16887-00-6	
Fluoride	<b>&lt;0.095</b>	mg/L	0.32	0.095	1		10/28/20 15:25	16984-48-8	
Sulfate	<b>&lt;0.44</b>	mg/L	2.0	0.44	1		10/28/20 15:25	14808-79-8	

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### ANALYTICAL RESULTS

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

**Sample: 2R-OW**      **Lab ID: 40216742005**      Collected: 10/15/20 14:30      Received: 10/17/20 09:05      Matrix: Water

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
<b>6020 MET ICPMS</b>		Analytical Method: EPA 6020    Preparation Method: EPA 3010 Pace Analytical Services - Green Bay							
Boron	<b>29.9</b>	ug/L	10.0	3.0	1	10/20/20 07:54	10/26/20 19:20	7440-42-8	
Calcium	<b>124000</b>	ug/L	254	76.2	1	10/20/20 07:54	10/22/20 20:10	7440-70-2	
<b>Field Data</b>		Analytical Method: Pace Analytical Services - Green Bay							
Field pH	<b>7.20</b>	Std. Units			1		10/15/20 14:30		
Field Specific Conductance	<b>1490</b>	umhos/cm			1		10/15/20 14:30		
Oxygen, Dissolved	<b>3.5</b>	mg/L			1		10/15/20 14:30	7782-44-7	
REDOX	<b>282</b>	mV			1		10/15/20 14:30		
Turbidity	<b>28.74</b>	NTU			1		10/15/20 14:30		
Static Water Level	<b>604.27</b>	feet			1		10/15/20 14:30		
Temperature, Water (C)	<b>13.6</b>	deg C			1		10/15/20 14:30		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C Pace Analytical Services - Green Bay							
Total Dissolved Solids	<b>806</b>	mg/L	20.0	8.7	1		10/19/20 17:05		
<b>9040 pH</b>		Analytical Method: EPA 9040 Pace Analytical Services - Green Bay							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.010	1		10/20/20 08:15		H6
<b>300.0 IC Anions</b>		Analytical Method: EPA 300.0 Pace Analytical Services - Green Bay							
Chloride	<b>179</b>	mg/L	10.0	2.2	5		10/28/20 17:20	16887-00-6	
Fluoride	<b>0.096J</b>	mg/L	0.32	0.095	1		11/02/20 12:43	16984-48-8	
Sulfate	<b>20.3</b>	mg/L	2.0	0.44	1		11/02/20 12:43	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

QC Batch:	368751	Analysis Method:	EPA 6020
QC Batch Method:	EPA 3010	Analysis Description:	6020 MET
		Laboratory:	Pace Analytical Services - Green Bay

Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

METHOD BLANK: 2131937 Matrix: Water  
Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<3.0	10.0	10/22/20 14:05	
Calcium	ug/L	<76.2	254	10/22/20 14:05	

LABORATORY CONTROL SAMPLE: 2131938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	474	95	80-120	
Calcium	ug/L	5000	4900	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2131939 2131940

Parameter	Units	40216632001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	690	500	500	1110	1110	84	84	75-125	0	20	
Calcium	ug/L	192000	5000	5000	203000	205000	220	254	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.

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### QUALITY CONTROL DATA

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

QC Batch: 368700 Analysis Method: SM 2540C  
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
Laboratory: Pace Analytical Services - Green Bay  
Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

METHOD BLANK: 2131681 Matrix: Water  
Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<8.7	20.0	10/19/20 17:01	

LABORATORY CONTROL SAMPLE: 2131682

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	584	532	91	80-120	

SAMPLE DUPLICATE: 2131683

Parameter	Units	40216680001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	228	218	4	10	

SAMPLE DUPLICATE: 2131684

Parameter	Units	40216744001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	228	214	6	10	

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### QUALITY CONTROL DATA

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

QC Batch: 368741

Analysis Method: EPA 9040

QC Batch Method: EPA 9040

Analysis Description: 9040 pH

Laboratory: Pace Analytical Services - Green Bay

Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

SAMPLE DUPLICATE: 2131902

Parameter	Units	40216567010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	20	H6

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### QUALITY CONTROL DATA

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

QC Batch: 369393

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: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

METHOD BLANK: 2135651

Matrix: Water

Associated Lab Samples: 40216742001, 40216742002, 40216742003, 40216742004, 40216742005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<0.43	2.0	10/28/20 10:09	
Fluoride	mg/L	<0.095	0.32	10/28/20 10:09	
Sulfate	mg/L	<0.44	2.0	10/28/20 10:09	

LABORATORY CONTROL SAMPLE: 2135652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	20	20.6	103	90-110	
Fluoride	mg/L	2	2.1	105	90-110	
Sulfate	mg/L	20	20.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2135653 2135654

Parameter	Units	40216742001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.9	100	100	122	121	108	108	90-110	0	15	
Fluoride	mg/L	<0.48	10	10	11.6	11.6	116	116	90-110	1	15	M0
Sulfate	mg/L	293	400	400	731	730	110	109	90-110	0	15	

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## QUALIFIERS

Project: 25220068 EDGE I-4 CLOSED CCR

Pace Project No.: 40216742

---

### 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

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

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

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

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

SD The serial dilution and the original analysis did not agree within  $\pm 10\%$ . The concentration is estimated due to a suspected chemical or physical interference.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 25220068 EDGE I-4 CLOSED CCR  
Pace Project No.: 40216742

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
40216742001	MW-301	EPA 3010	368751	EPA 6020	368970
40216742002	MW-302	EPA 3010	368751	EPA 6020	368970
40216742003	MW-303	EPA 3010	368751	EPA 6020	368970
40216742004	FIELD BLANK	EPA 3010	368751	EPA 6020	368970
40216742005	2R-OW	EPA 3010	368751	EPA 6020	368970
40216742001	MW-301				
40216742002	MW-302				
40216742003	MW-303				
40216742005	2R-OW				
40216742001	MW-301	SM 2540C	368700		
40216742002	MW-302	SM 2540C	368700		
40216742003	MW-303	SM 2540C	368700		
40216742004	FIELD BLANK	SM 2540C	368700		
40216742005	2R-OW	SM 2540C	368700		
40216742001	MW-301	EPA 9040	368741		
40216742002	MW-302	EPA 9040	368741		
40216742003	MW-303	EPA 9040	368741		
40216742004	FIELD BLANK	EPA 9040	368741		
40216742005	2R-OW	EPA 9040	368741		
40216742001	MW-301	EPA 300.0	369393		
40216742002	MW-302	EPA 300.0	369393		
40216742003	MW-303	EPA 300.0	369393		
40216742004	FIELD BLANK	EPA 300.0	369393		
40216742005	2R-OW	EPA 300.0	369393		

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 1241 Bellevue Street, Green Bay, WI 54302	Document Name: <b>Sample Condition Upon Receipt (SCUR)</b>	Document Revised: 26Mar2020
	Document No.: <b>ENV-FRM-GBAY-0014-Rev.00</b>	Author: Pace Green Bay Quality Office

**Sample Condition Upon Receipt Form (SCUR)**

**Client Name:** SCS Engineers  
**Courier:**  CS Logistics  Fed Ex  Speedee  UPS  Walco  
 Client  Pace Other: \_\_\_\_\_

Project #: \_\_\_\_\_

**WO# : 40216742**



40216742

**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 - NA 99 **Type of Ice:**  Wet  Blue Dry  None

**Cooler Temperature** 7.20 **Uncorr:** 0.5 **ICorr:** 2.5  Samples on ice, cooling process has begun  
**Temp Blank Present:**  yes  no 3.5 **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:** 10/17/20 **Initials:** MLR  
**Labeled By Initials:** MLR

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

**Client Notification/ Resolution:** \_\_\_\_\_ If checked, see attached form for additional comments   
 Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Comments/ Resolution: 11 # containers, pres. MLR 10-17-20

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



Appendix D  
Historical Monitoring Results

# Single Location

Name: WPL - Edgewater Closed

Location ID: 2R-OW																
Number of Sampling Dates: 15																
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	10/23/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020
Boron	ug/L	100	22.4	32.6	43.1	31.2	70.6	45.2	35.7	55.9	19.7	34.7	35.8	58.8	52.3	29.9
Calcium	ug/L	205000	148000	145000	155000	152000	143000	145000	164000	170000	121000	190000	121000	132000	117000	124000
Chloride	mg/L	91.7	232	215	217	201	102	115	272	305	108	462	55.3	88.8	67.5	179
Fluoride	mg/L	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.1	<0.1	<0.1	<0.095	0.096
Field pH	Std. Units	7.34	7.02	6.1	6.98	7.15	7.01	6.86	7	7.23	7.29	7.03	8.57	6.88	7.08	7.2
Sulfate	mg/L	19.5	28	25.4	21.6	23.9	17.6	17.8	28.8	29.3	17.2	37.2	10.6	13.2	11.6	20.3
Total Dissolved Solids	mg/L	774	908	974	944	854	750	744	1000	1010	680	1260	610	706	604	806
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	7.1	7.4	7	7.5	7.1	7.1	7.4
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	1864	1177	2202	1077	1261	1081	1490
Oxygen, Dissolved	mg/L	4.6	0.9	1	0.6	1	0.5	0.1	0	4.9	6.7	1.6	0.6	2.5	1.5	3.5
Field Oxidation Potential	mV	130	82	140	117	87	120	-20	-22	131	85	180	75	148	43.7	282
Groundwater Elevation	feet	610.02	606.7	605.74	607.27	609.64	609.27	607.63	604.59	601.74	607.87	604.61	609.5	609.39	608.97	604.27
Temperature, Water (C)	deg C	5.6	10.6	13.9	14.1	7.5	7	10.1	13	13	5.2	13.4	6.7	14	6.1	13.6
Turbidity	NTU	612.3	10.97	3.64	3.32	11.71	16.46	0.55	41.3	2.24	6.38	7.09	8.59	--	15.24	28.74

# Single Location

Name: WPL - Edgewater Closed

Location ID: MW-301																	
Number of Sampling Dates: 16																	
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	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	8550	8190	8450	8620	9280	8370	9160	8610	8820	7950	8230	7310	7220	7450	--	6550
Calcium	ug/L	88700	92200	84000	89400	89200	98800	94900	83600	87200	78900	88800	77500	87600	80800	--	114000
Chloride	mg/L	16.2	15.9	13.7	13.9	13.8	12.7	13.5	12.3	11.9	11.2	11.5	11.4	11.1	12.5	--	13.9
Fluoride	mg/L	0.33	0.36	0.33	0.34	0.42	0.21	<0.1	0.32	<0.1	0.25	0.2	0.29	0.24	0.39	0.26	<0.48
Field pH	Std. Units	7.91	7.48	6.47	7.68	8.03	7.98	7.7	7.58	7.43	8.02	7.71	8.18	7.56	7.82	7.53	7.64
Sulfate	mg/L	372	343	368	369	372	367	362	340	341	332	318	322	312	298	--	293
Total Dissolved Solids	mg/L	838	794	862	838	826	838	804	780	772	752	722	724	694	718	--	678
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	7.5	7.8	7.7	7.9	7.8	7.9	--	7.6
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	1096	1071	1086	1022	1052	977	983	996
Oxygen, Dissolved	mg/L	4.8	1.6	0.1	0.2	7.4	5.5	3	0.5	0	6.5	4.5	6.2	2.7	6.9	5.47	0.8
Field Oxidation Potential	mV	5.2	89	-31	-24	173	51	-15	-13	-18	44	53	55	146	17.1	49.1	140
Groundwater Elevation	feet	599.94	598.3	598	598.5	597.1	600.04	598.77	597.4	597.2	598.54	597.6	598.92	599.56	599.17	597.89	595.1
Temperature, Water (C)	deg C	7.2	10.1	10.5	10.8	8.8	8.9	9.5	11.6	10.7	7.8	11	9	12.2	8.5	16.8	11.2
Turbidity	NTU	10.88	3.13	2.42	46.07	21.84	168.6	16.11	6.51	11.58	12.19	13.32	32.91	79.44	37.12	62.57	130

# Single Location

Name: WPL - Edgewater Closed

Location ID: MW-302		Number of Sampling Dates: 15														
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	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020
Boron	ug/L	1950	2010	2000	2150	2000	1970	1970	1890	1760	1800	1570	1670	1730	1570	1410
Calcium	ug/L	122000	116000	75900	72100	87400	114000	72200	62600	68100	68000	64700	64800	67500	66800	124000
Chloride	mg/L	18.9	27.2	18	19.5	18.6	18.9	20	19.3	18.9	18.5	18.6	18.4	17.8	19.2	20.9
Fluoride	mg/L	0.83	1.3	0.8	0.8	0.89	0.76	0.9	0.78	0.84	0.78	0.81	0.87	0.85	0.97	1
Field pH	Std. Units	8.01	7.73	6.55	7.89	7.98	7.99	7.84	7.76	7.6	7.78	7.99	7.98	7.86	7.56	7.9
Sulfate	mg/L	75.1	89.6	80.7	77.2	71.1	85.8	88.5	80.2	72.2	72.7	59.2	71.7	55.7	65.3	73.1
Total Dissolved Solids	mg/L	352	364	396	348	328	358	350	360	316	314	306	324	290	316	182
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	7.7	7.8	7.6	7.8	7.6	7.8	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	505	517	504	519	487	476	523
Oxygen, Dissolved	mg/L	1	0.2	0.1	1	0.1	0	0.5	0	0	0.6	0.8	1.6	1.3	0.4	0.3
Field Oxidation Potential	mV	-41	-123	-123	-111	-87	-517	-40	-121	-118	-123	-96	-95	124	-107.6	-83
Groundwater Elevation	feet	596.39	595.68	595.53	595.46	596.3	593.57	595.86	595.22	595.25	595.71	595.28	595.68	595.58	595.33	590.18
Temperature, Water (C)	deg C	9	13.1	13.2	11.2	9.3	9.6	12.2	12.6	11.1	10.3	11.6	11.9	13.5	11.3	11.2
Turbidity	NTU	885.4	369.4	108.3	62.99	161.1	367.5	94.92	39.69	42.45	24.89	55.15	59.51	32.69	69.22	161.8

# Single Location

Name: WPL - Edgewater Closed

Location ID: MW-303		Number of Sampling Dates: 15														
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	10/24/2017	4/2/2018	10/1/2018	4/8/2019	10/7/2019	4/8/2020	10/15/2020
Boron	ug/L	4210	3360	3860	3740	4210	4170	4570	3780	3480	3040	2360	2930	2830	3380	3310
Calcium	ug/L	176000	138000	145000	147000	147000	135000	154000	139000	173000	146000	139000	135000	136000	144000	132000
Chloride	mg/L	21.8	31.5	22.8	26	26.2	22.7	25.4	23.2	20.4	19.7	4.3	20	19.1	23.5	20.9
Fluoride	mg/L	<0.2	<1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.48	<0.48
Field pH	Std. Units	7.04	6.79	6.09	6.94	6.94	6.88	7	6.94	7.14	6.86	6.93	7.15	6.9	6.7	7.11
Sulfate	mg/L	3	11.4	2.4	5.6	<5	<5	<5	<5	<5	<5	<1	<5	<5	<2.2	<2.2
Total Dissolved Solids	mg/L	660	716	732	744	738	700	714	714	566	630	620	668	584	692	620
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	6.8	7	6.8	6.9	7	6.8	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	1095	1131	1105	1196	1127	1241	1123
Oxygen, Dissolved	mg/L	0.49	0.9	0.1	0	0	0	0.8	0	0	0.3	0.2	0.3	0.2	0.2	0.2
Field Oxidation Potential	mV	-48	-71	-81	-102	-89	-20	-58	-116	-108	-97	-93	-85	122	-102.9	-32
Groundwater Elevation	feet	589.24	587.22	587.72	588.37	588.84	589.04	588.44	587.36	587.97	588.77	588.17	588.88	588.77	588.66	585.07
Temperature, Water (C)	deg C	9.1	11.6	11.9	10.7	10.5	10	10.2	10.4	11	9.8	10.7	10.3	11.8	10	10.9
Turbidity	NTU	409.5	18.26	48.39	16.45	12.58	9.61	186.4	28.41	563	233.5	107.1	61.84	94.01	87.6	70.42





Appendix E  
Statistical Evaluation

January 14, 2021  
File No. 25220068.00

## TECHNICAL MEMORANDUM

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

**PREPARED BY:** Nicole Kron

**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 October 2020 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 October 2020 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.

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 8/2017) and the data to be added (10/2017 through 10/2020) 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 significant 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 October 2020 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 Quantification 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 October 2020 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 quantification 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.

TECHNICAL MEMORANDUM

January 14, 2021

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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**.

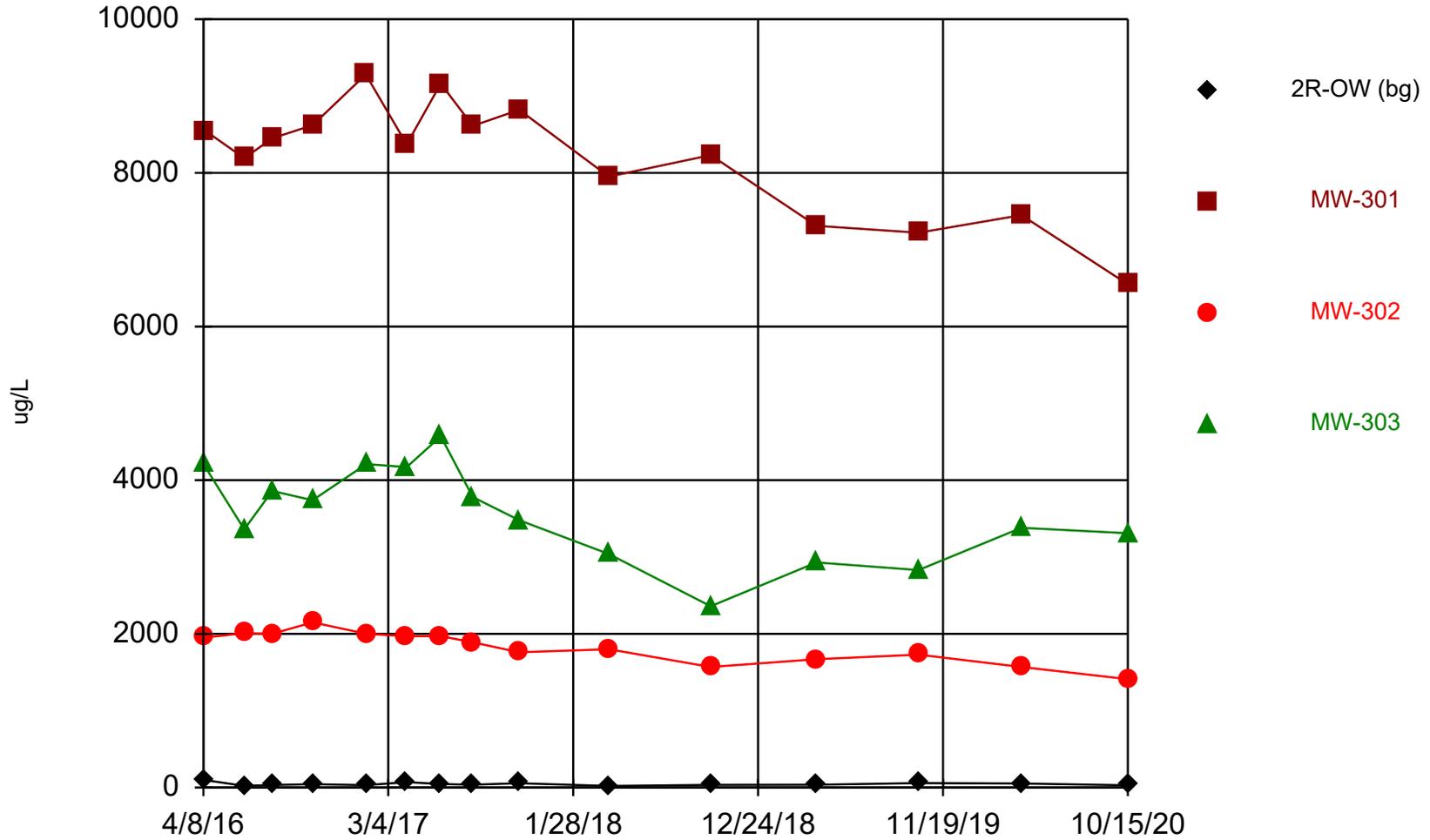
NDK/SCC

I:\25220068.00\Data and Calculations\Sanitas\EDG\_Clsd - UPL calcs\Edg Closed CCR Stats Memo.docx

## Attachment 1

### Times Series Graphs

# Boron



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Time Series

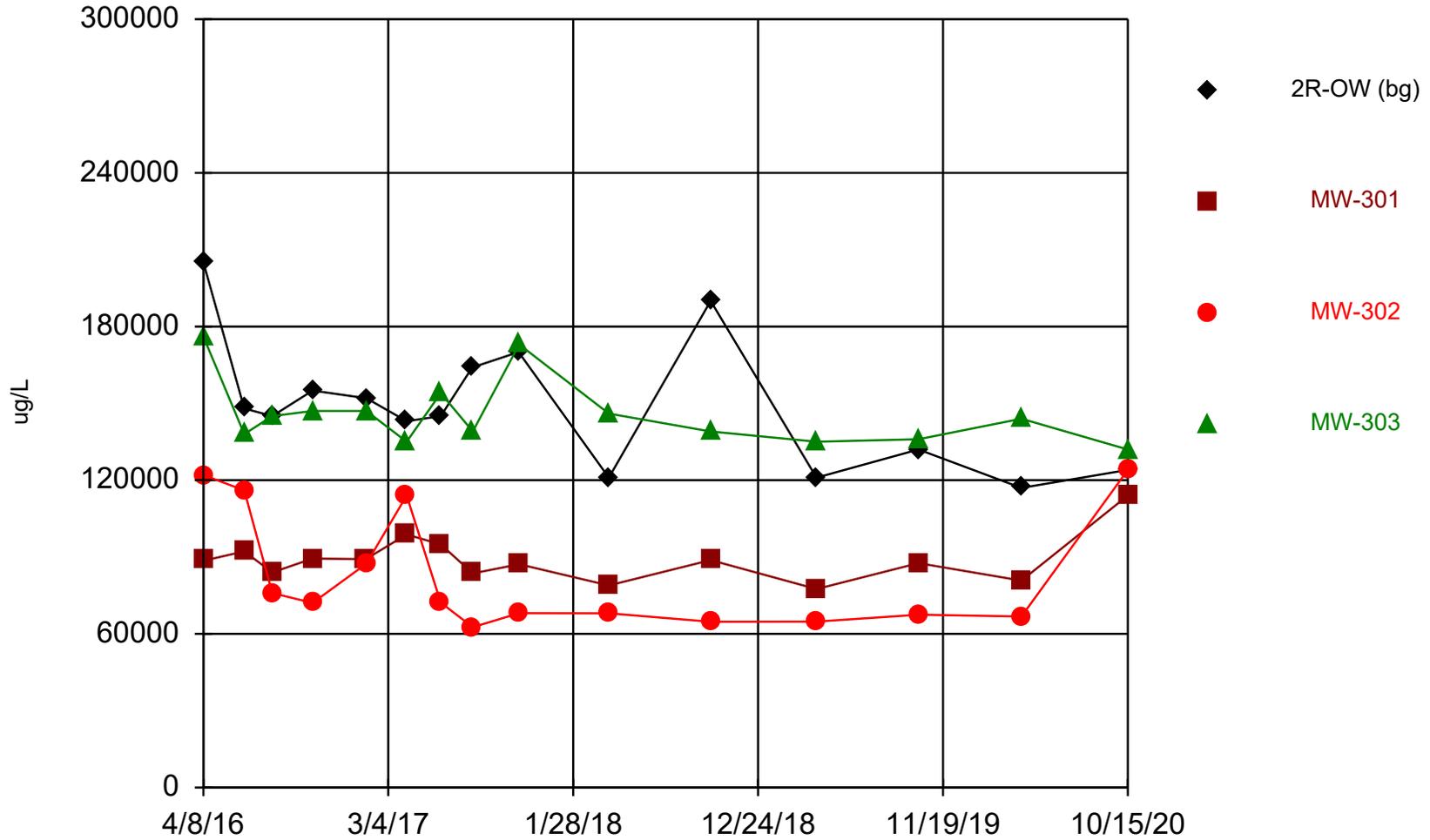
Constituent: Boron (ug/L) Analysis Run 12/21/2020 5:36 PM

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



# Calcium



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

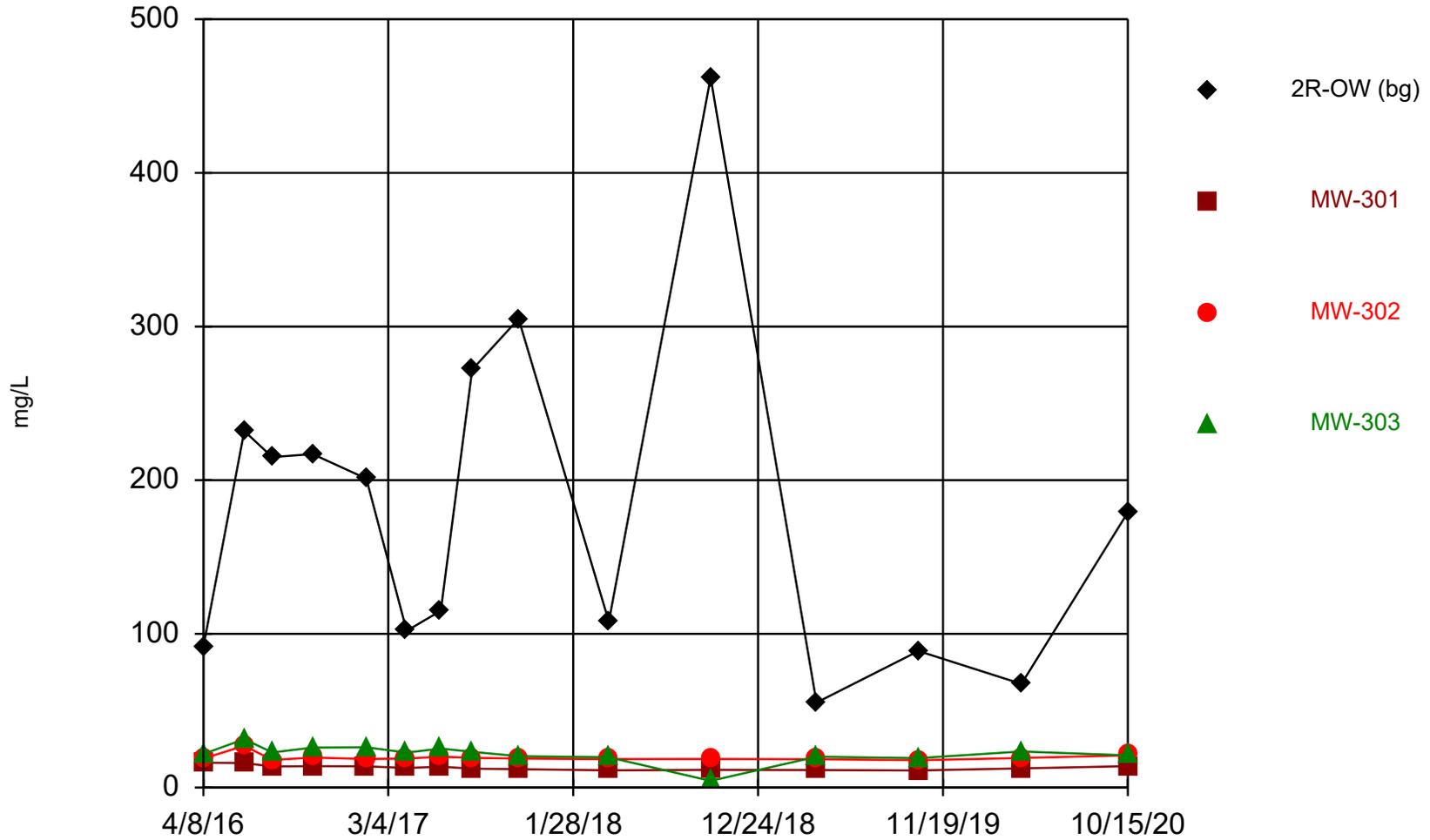
# Time Series

Constituent: Calcium (ug/L) Analysis Run 12/21/2020 5:36 PM

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

# Chloride



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

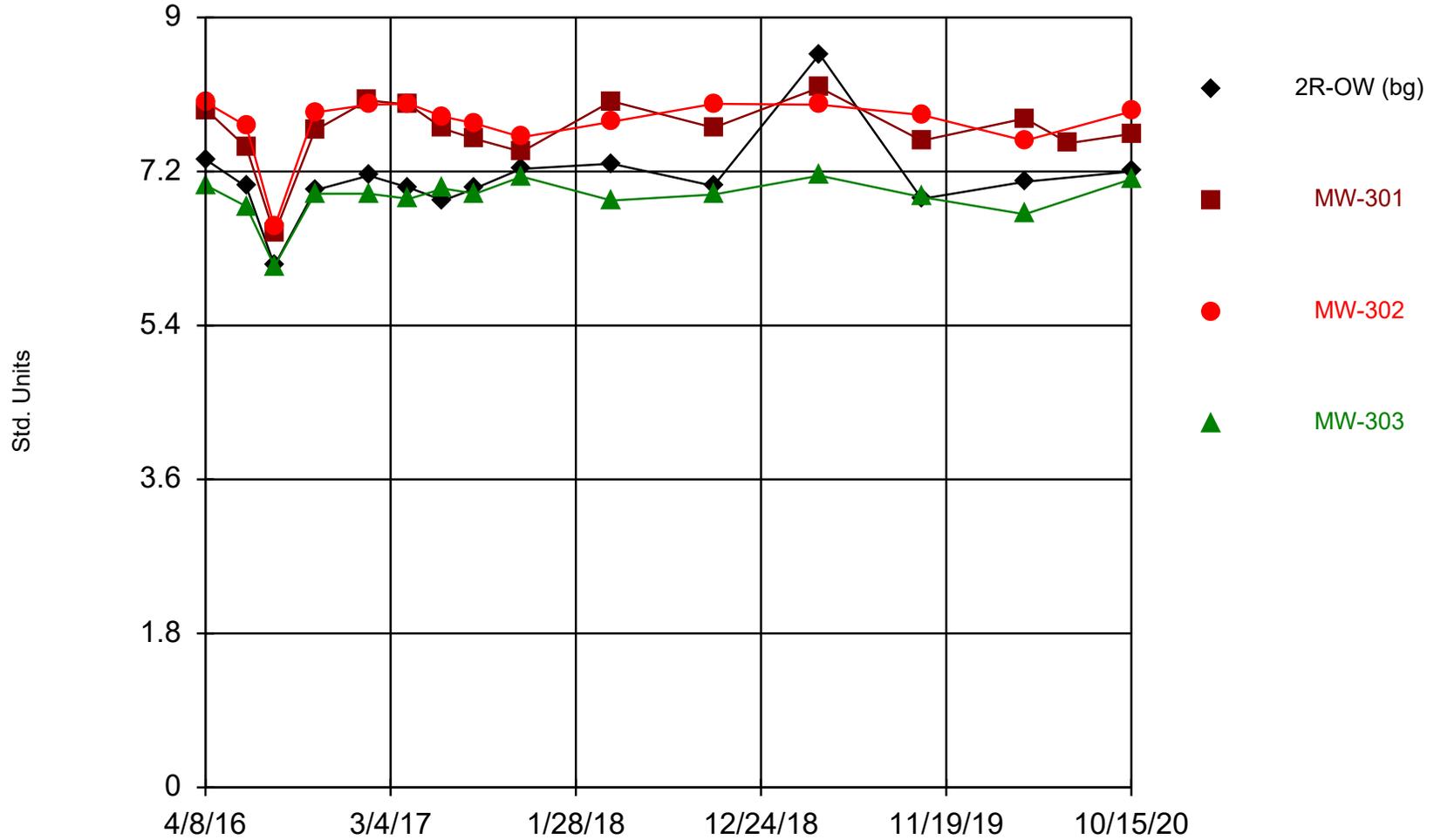
# Time Series

Constituent: Chloride (mg/L) Analysis Run 12/21/2020 5:36 PM

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

### Field pH



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

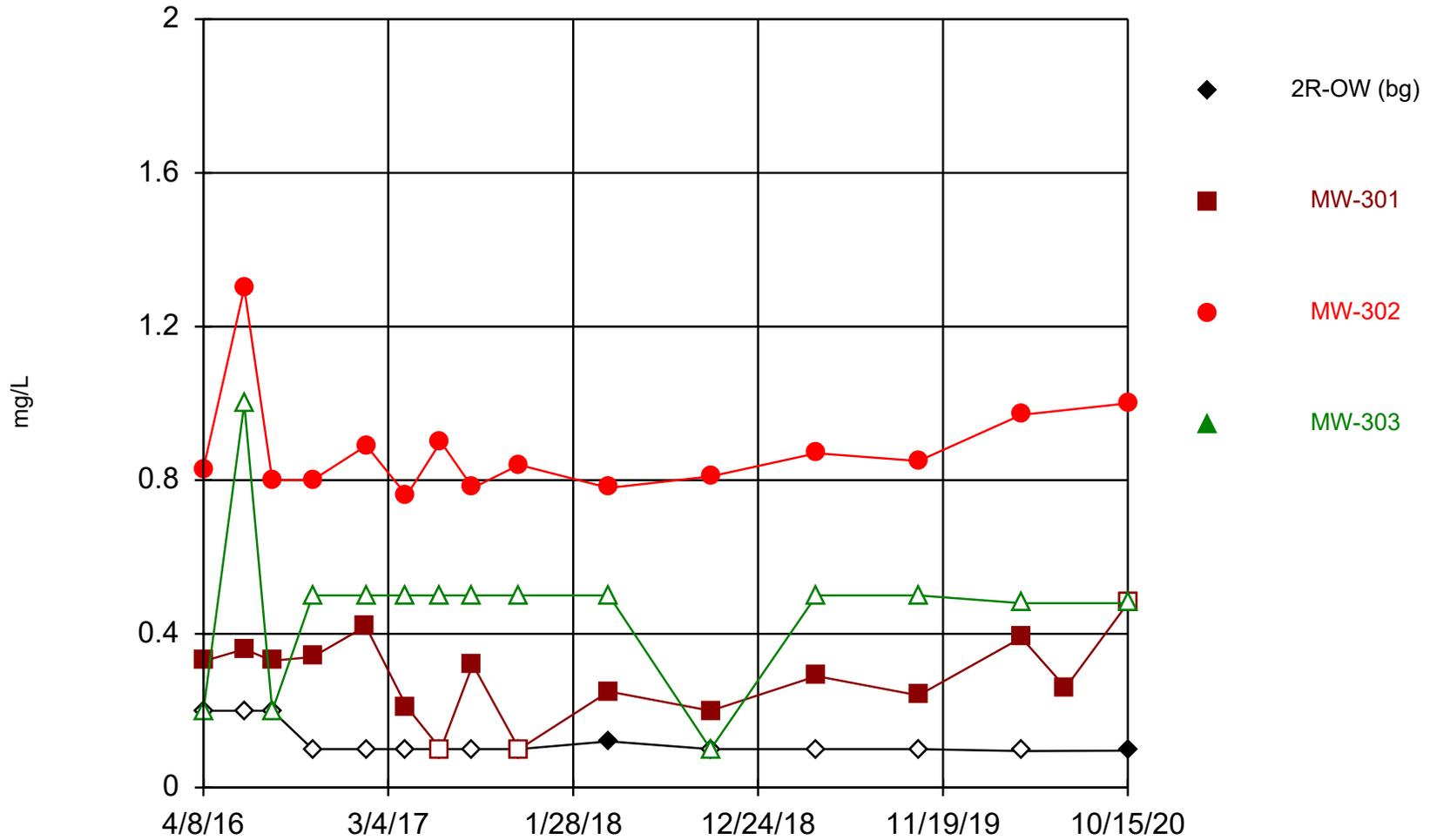
# Time Series

Constituent: Field pH (Std. Units) Analysis Run 12/21/2020 5:36 PM

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	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

# Fluoride



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Time Series

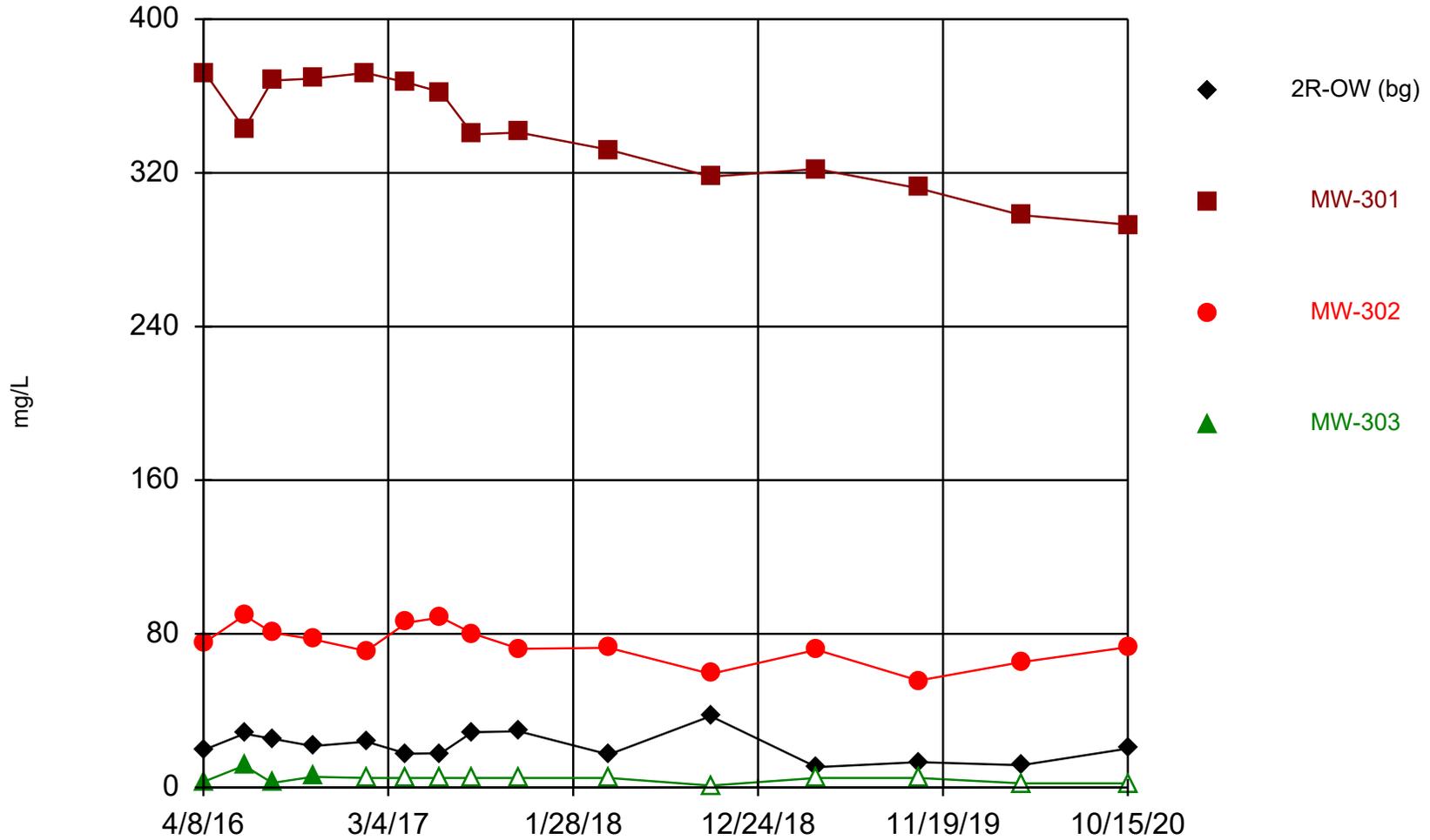
Constituent: Fluoride (mg/L) Analysis Run 12/21/2020 5:36 PM

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)



### Sulfate



Time Series Analysis Run 12/21/2020 5:35 PM

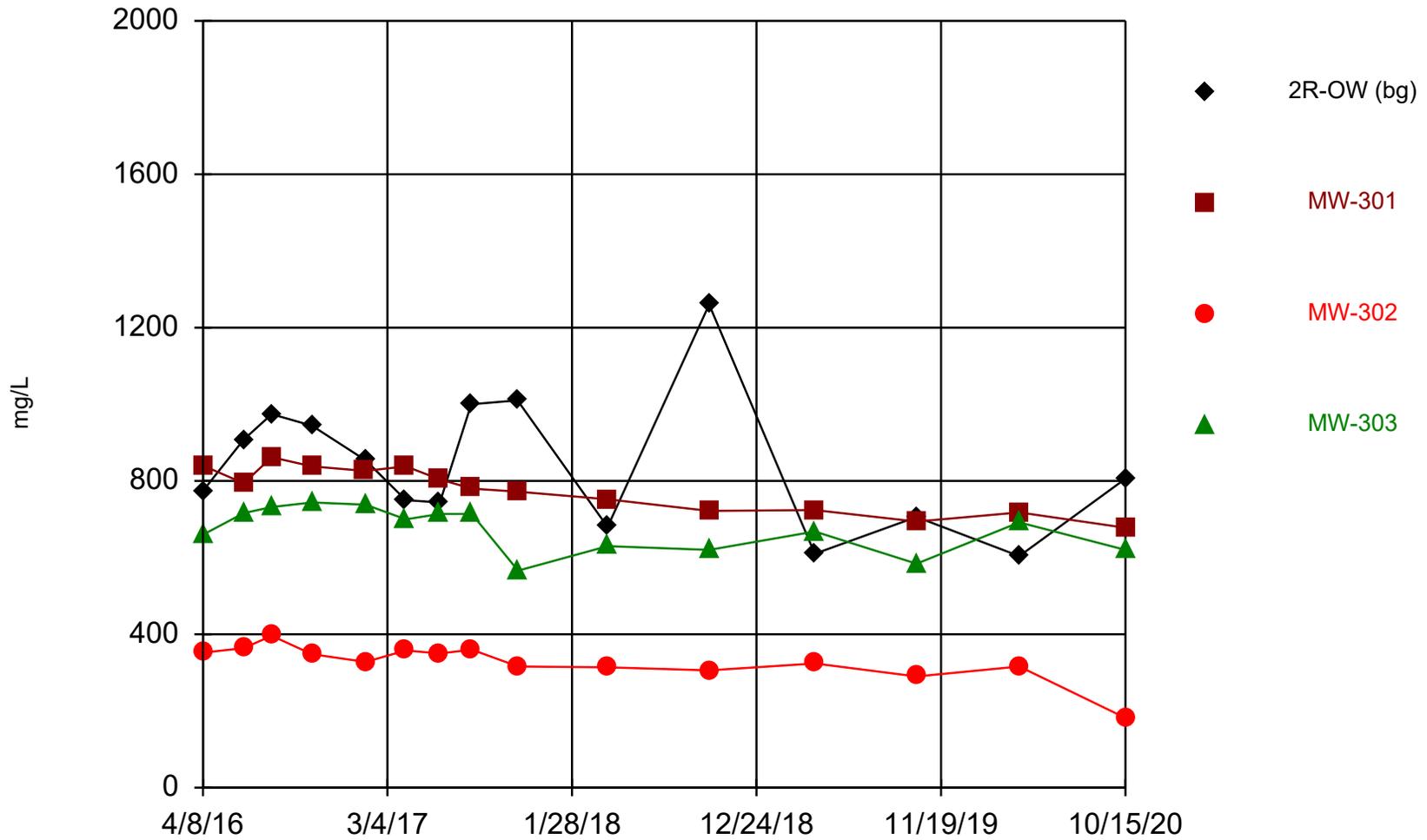
# Time Series

Constituent: Sulfate (mg/L) Analysis Run 12/21/2020 5:36 PM

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)

### Total Dissolved Solids



Time Series Analysis Run 12/21/2020 5:35 PM

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Time Series

Constituent: Total Dissolved Solids (mg/L) Analysis Run 12/21/2020 5:36 PM

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

Attachment 2

Outlier Analysis

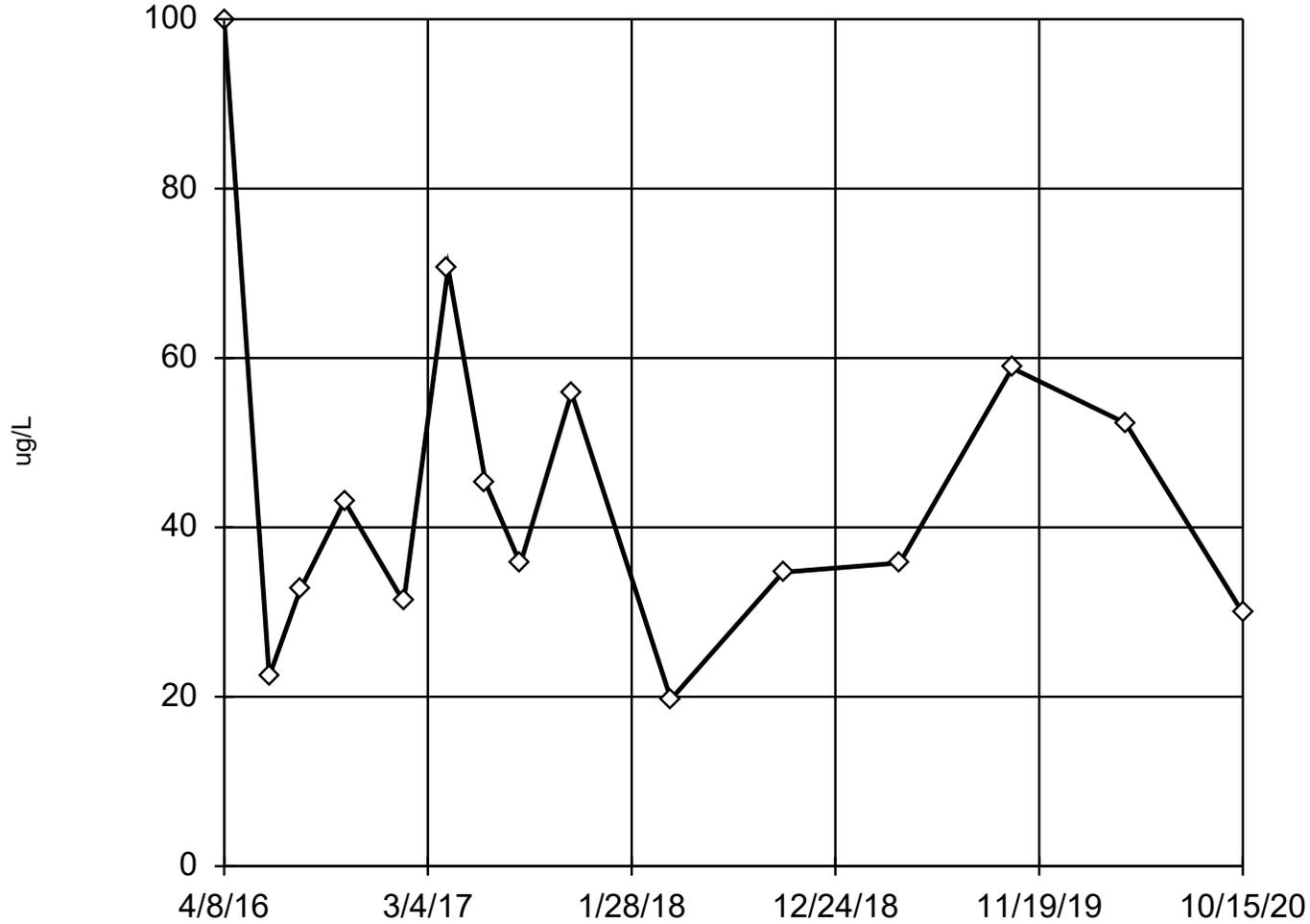
# Outlier Analysis

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020 Printed 12/28/2020, 6:04 PM

<u>Constituent</u>	<u>Well</u>	<u>Outlier</u>	<u>Value(s)</u>	<u>Date(s)</u>	<u>Method</u>	<u>Alpha</u>	<u>N</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>Distribution</u>	<u>Normality Test</u>
Boron (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	44.53	20.78	ln(x)	ShapiroWilk
Calcium (ug/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	148800	25498	normal	ShapiroWilk
Chloride (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	180.8	109.9	ln(x)	ShapiroWilk
<b>Field pH (Std. Units)</b>	<b>2R-OW (bg)</b>	<b>Yes</b>	<b>8.57,6.1</b>	<b>4/8/2019,...</b>	<b>Dixon`s</b>	<b>0.05</b>	<b>15</b>	<b>7.116</b>	<b>0.495</b>	<b>normal</b>	<b>ShapiroWilk</b>
Sulfate (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	21.47	7.379	normal	ShapiroWilk
Total Dissolved Solids (mg/L)	2R-OW (bg)	No	n/a	n/a	EPA 1989	0.05	15	841.6	177.2	normal	ShapiroWilk

### EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 44.53, std. dev.  
20.78, critical Tn 2.409

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9789  
Critical = 0.901 (after  
natural log transforma-  
tion)  
The distribution was found  
to be log-normal.

Constituent: Boron Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# EPA 1989 Outlier Screening

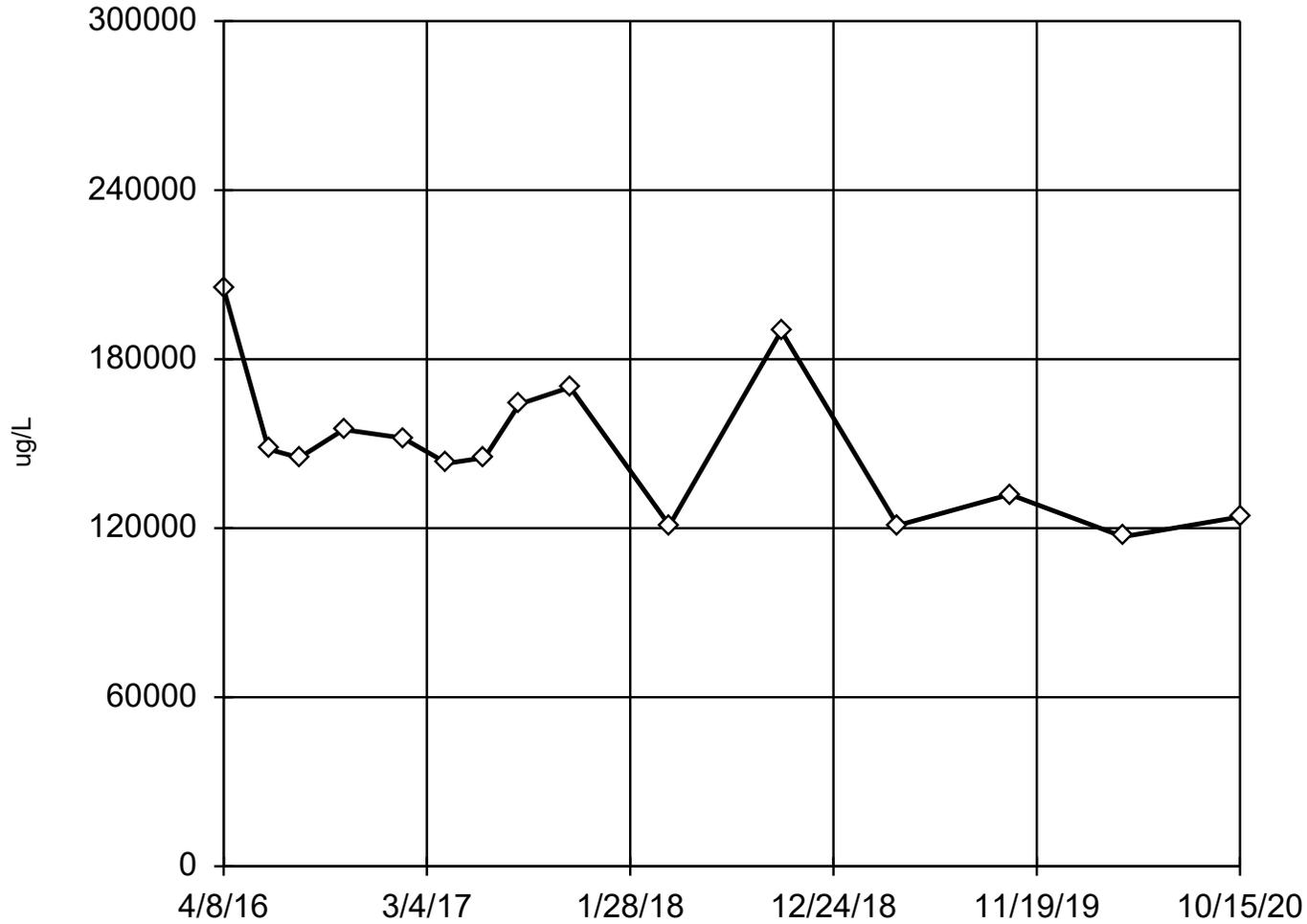
Constituent: Boron (ug/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

	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



### EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 148800, std. dev.  
25498, critical Tn 2.409

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9279  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Calcium Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

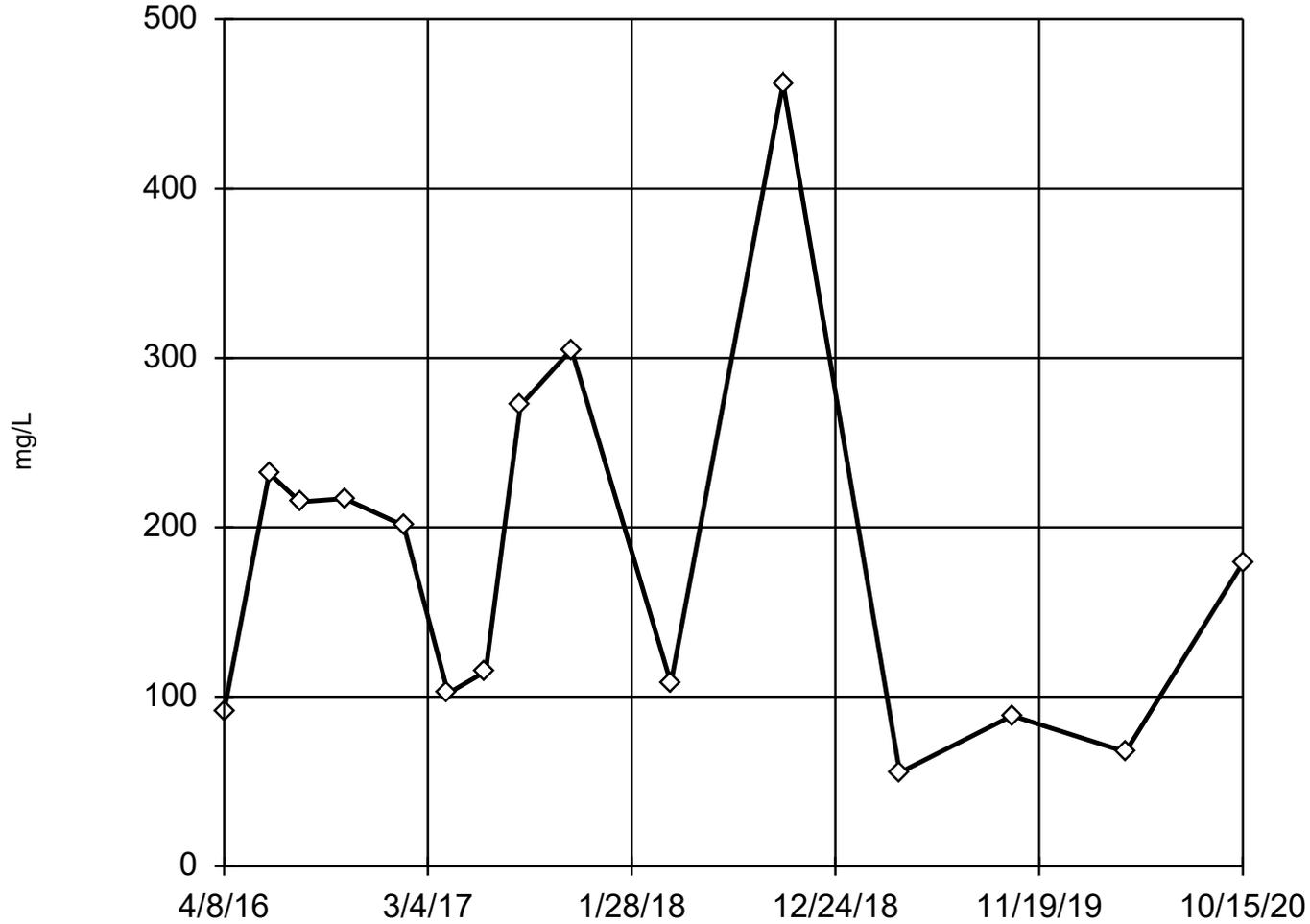
# EPA 1989 Outlier Screening

Constituent: Calcium (ug/L) Analysis Run 12/28/2020 6:04 PM 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

### EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 180.8, std. dev.  
109.9, critical Tn 2.409

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9641  
Critical = 0.901 (after  
natural log transforma-  
tion)  
The distribution was found  
to be log-normal.

Constituent: Chloride Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

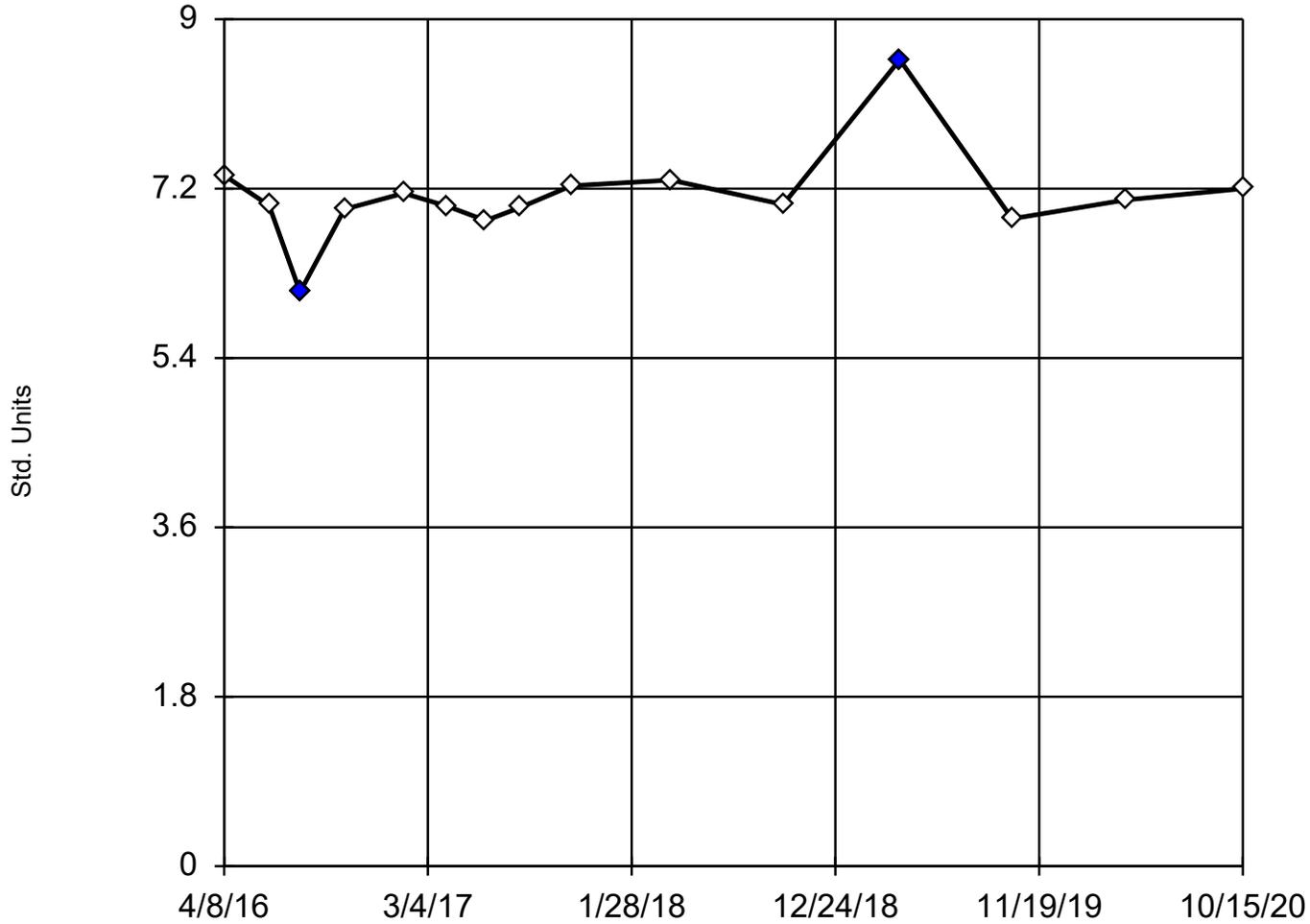
# EPA 1989 Outlier Screening

Constituent: Chloride (mg/L) Analysis Run 12/28/2020 6:04 PM 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

### Dixon's Outlier Test

2R-OW (bg)



n = 15

Statistical outliers are drawn as solid.  
Testing for 1 high and 1 low outliers.  
Mean = 7.116.  
Std. Dev. = 0.495.  
8.57: c = 0.7574  
tab1 = 0.525.  
6.1: c = 0.6555  
tab1 = 0.525.  
Alpha = 0.05.

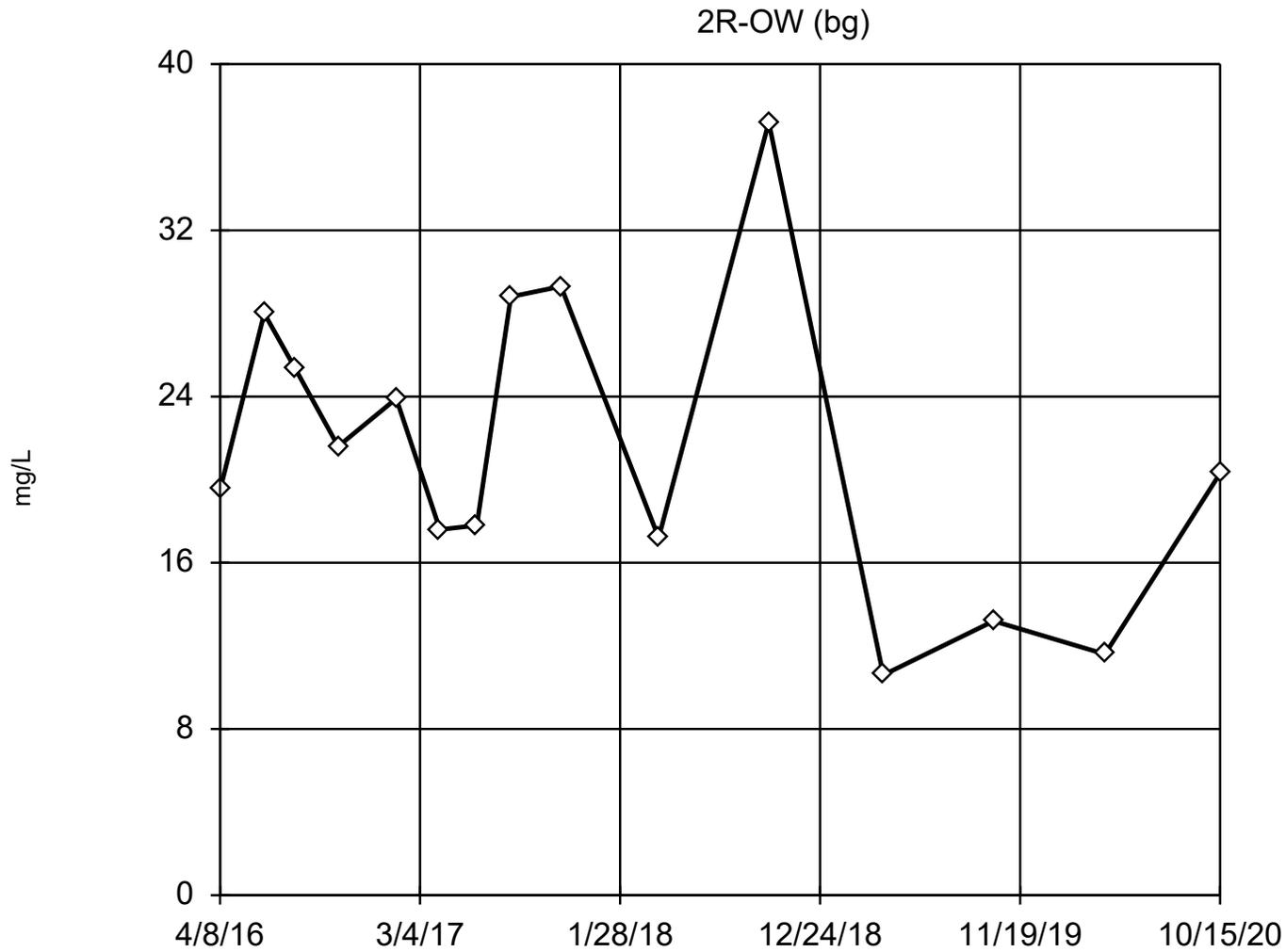
Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9533  
Critical = 0.889  
The distribution, after removal of suspect values, was found to be normally distributed.

# Dixon's Outlier Test

Constituent: Field pH (Std. Units) Analysis Run 12/28/2020 6:04 PM 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 (O)
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

### EPA Screening (suspected outliers for Dixon's Test)



n = 15

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 21.47, std. dev.  
7.379, critical Tn 2.409

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9672  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Sulfate Analysis Run 12/28/2020 6:03 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# EPA 1989 Outlier Screening

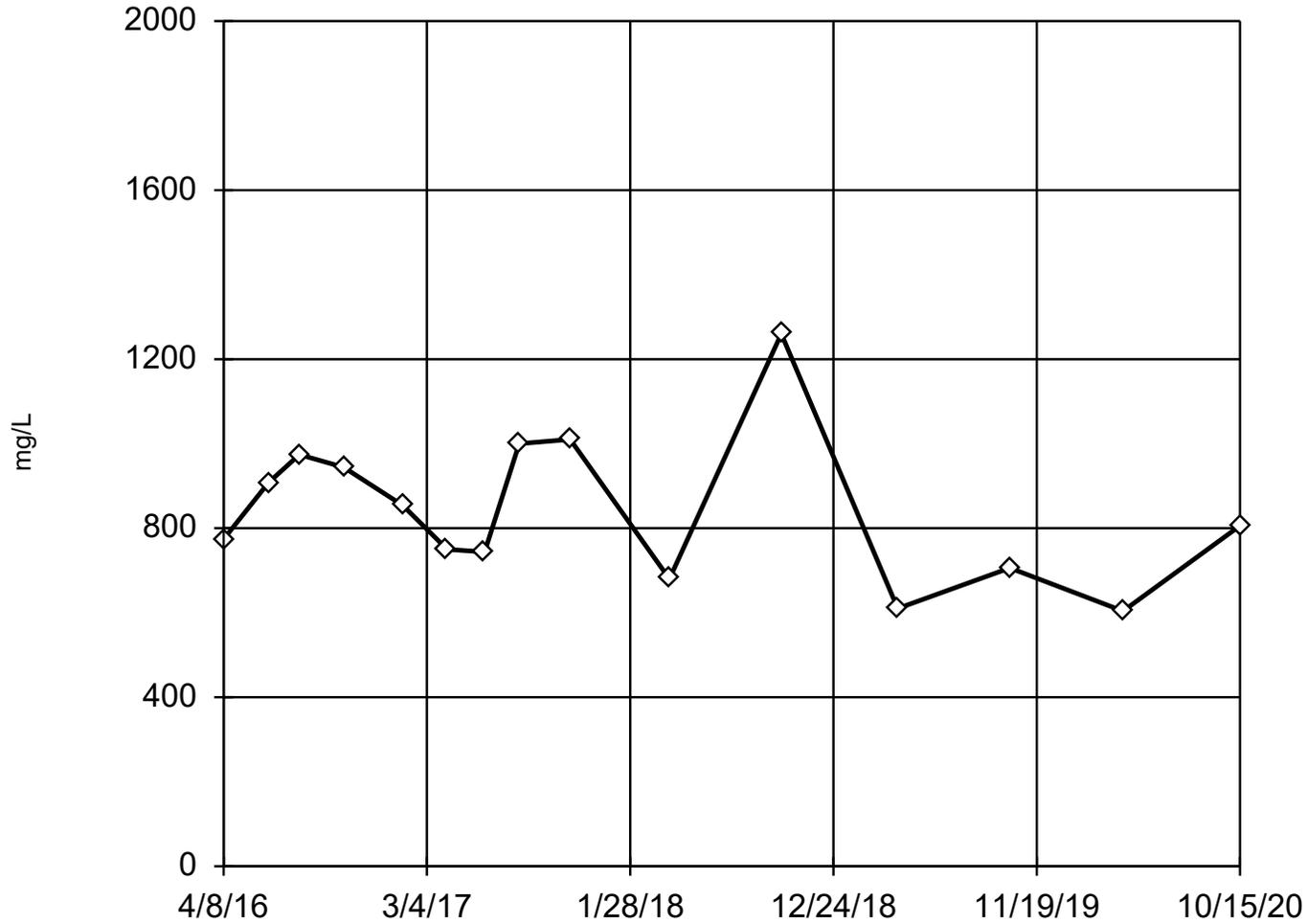
Constituent: Sulfate (mg/L) Analysis Run 12/28/2020 6:04 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

	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



### EPA Screening (suspected outliers for Dixon's Test)

2R-OW (bg)



n = 15

Dixon's will not be run.  
No suspect values identified  
or unable to establish  
suspect values.  
Mean 841.6, std. dev.  
177.2, critical Tn 2.409

Normality test used:  
Shapiro Wilk@alpha = 0.1  
Calculated = 0.9458  
Critical = 0.901  
The distribution was found  
to be normally distrib-  
uted.

Constituent: Total Dissolved Solids    Analysis Run 12/28/2020 6:03 PM    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 12/28/2020 6:04 PM 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

## Attachment 3

Welch's/Mann-Whitney Comparison

# Welch's t-test/Mann-Whitney

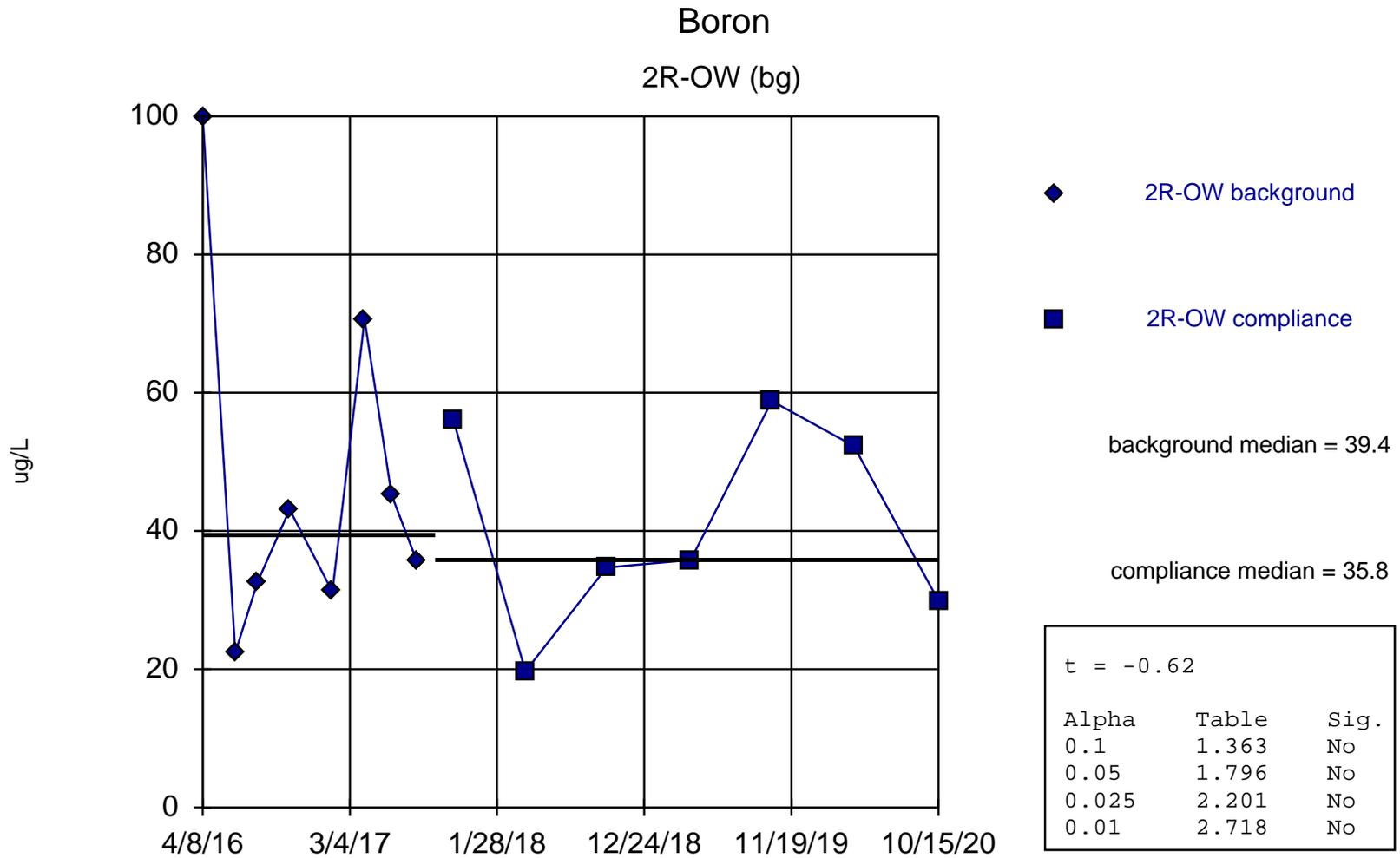
Edgewater Closed Generating Station

Client: SCS Engineers

Data: EDG\_Clsd - Chem- export-Dec2020

Printed 1/3/2021, 4:20 PM

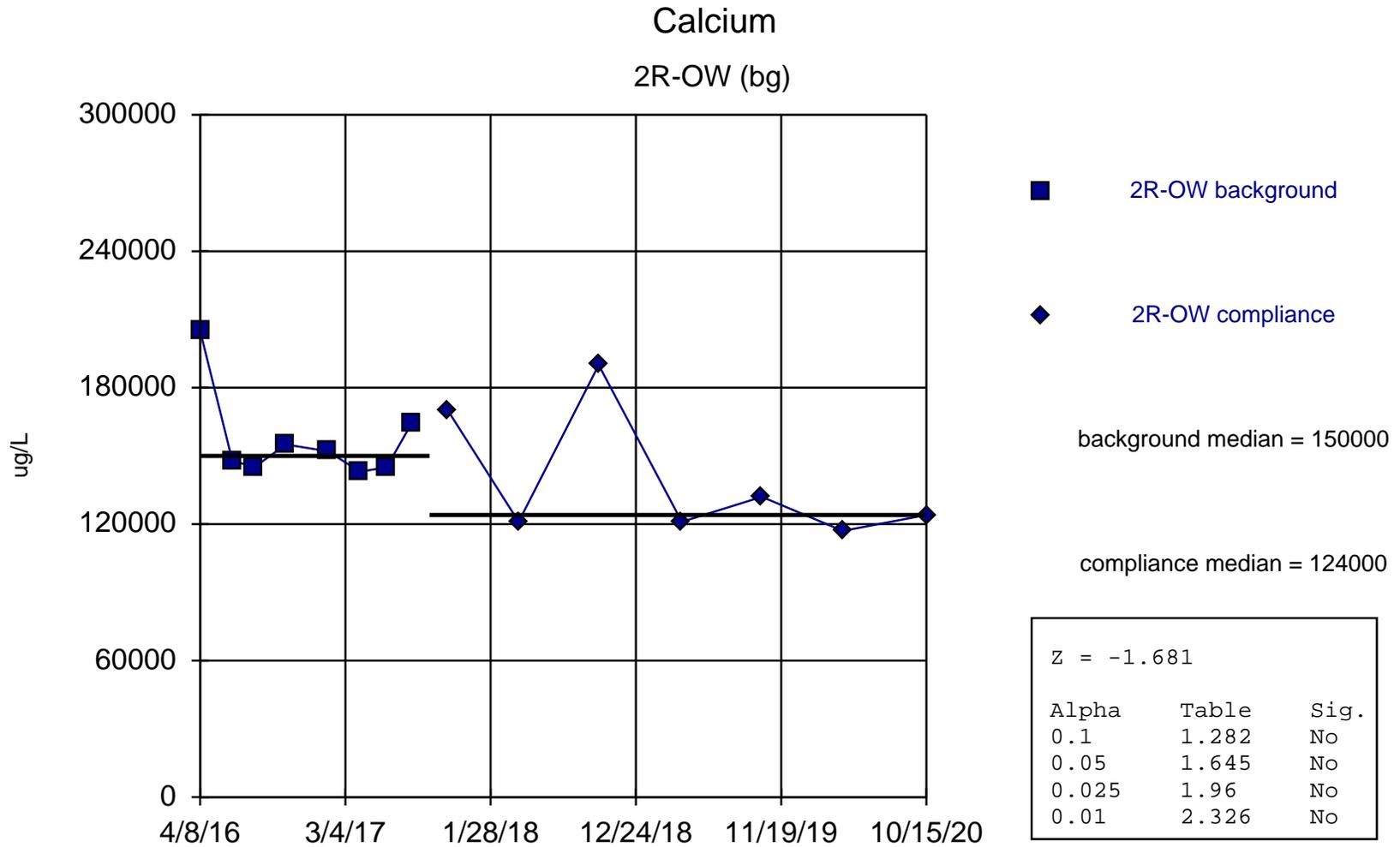
<u>Constituent</u>	<u>Well</u>	<u>Calc.</u>	<u>0.1</u>	<u>0.05</u>	<u>0.025</u>	<u>0.01</u>	<u>Alpha</u>	<u>Sig.</u>	<u>Bg. Wells</u>	<u>Method</u>
Boron (ug/L)	2R-OW (bg)	-0.62	No	No	No	No	0.01	No	(inrawell)	Welch`s
Calcium (ug/L)	2R-OW (bg)	-1.681	No	No	No	No	0.01	No	(inrawell)	Mann-W (normality)
Chloride (mg/L)	2R-OW (bg)	0.0...	No	No	No	No	0.01	No	(inrawell)	Welch`s
Field pH (Std. Units)	2R-OW (bg)	1.238	No	No	No	No	0.01	No	(inrawell)	Welch`s
Fluoride (mg/L)	2R-OW (bg)	-1.771	No	No	No	No	0.01	No	(inrawell)	Mann-W (NDs)
Sulfate (mg/L)	2R-OW (bg)	-0....	No	No	No	No	0.01	No	(inrawell)	Welch`s
Total Dissolved Solids (mg/L)	2R-OW (bg)	-0....	No	No	No	No	0.01	No	(inrawell)	Welch`s



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.842, critical = 0.818.

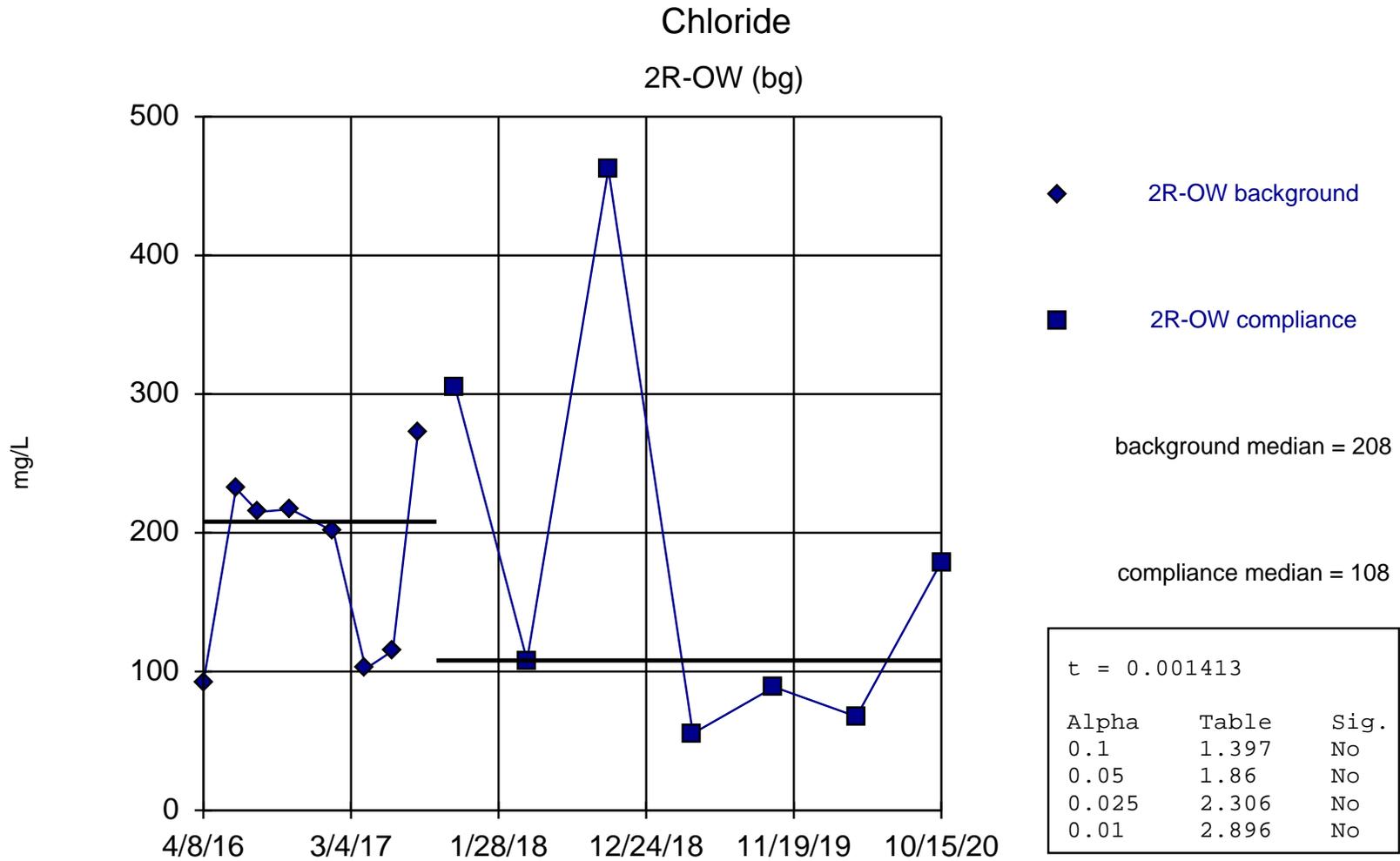
Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020



Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because the Shapiro Wilk normality test showed the data to be non-normal at the 0.05 alpha level.

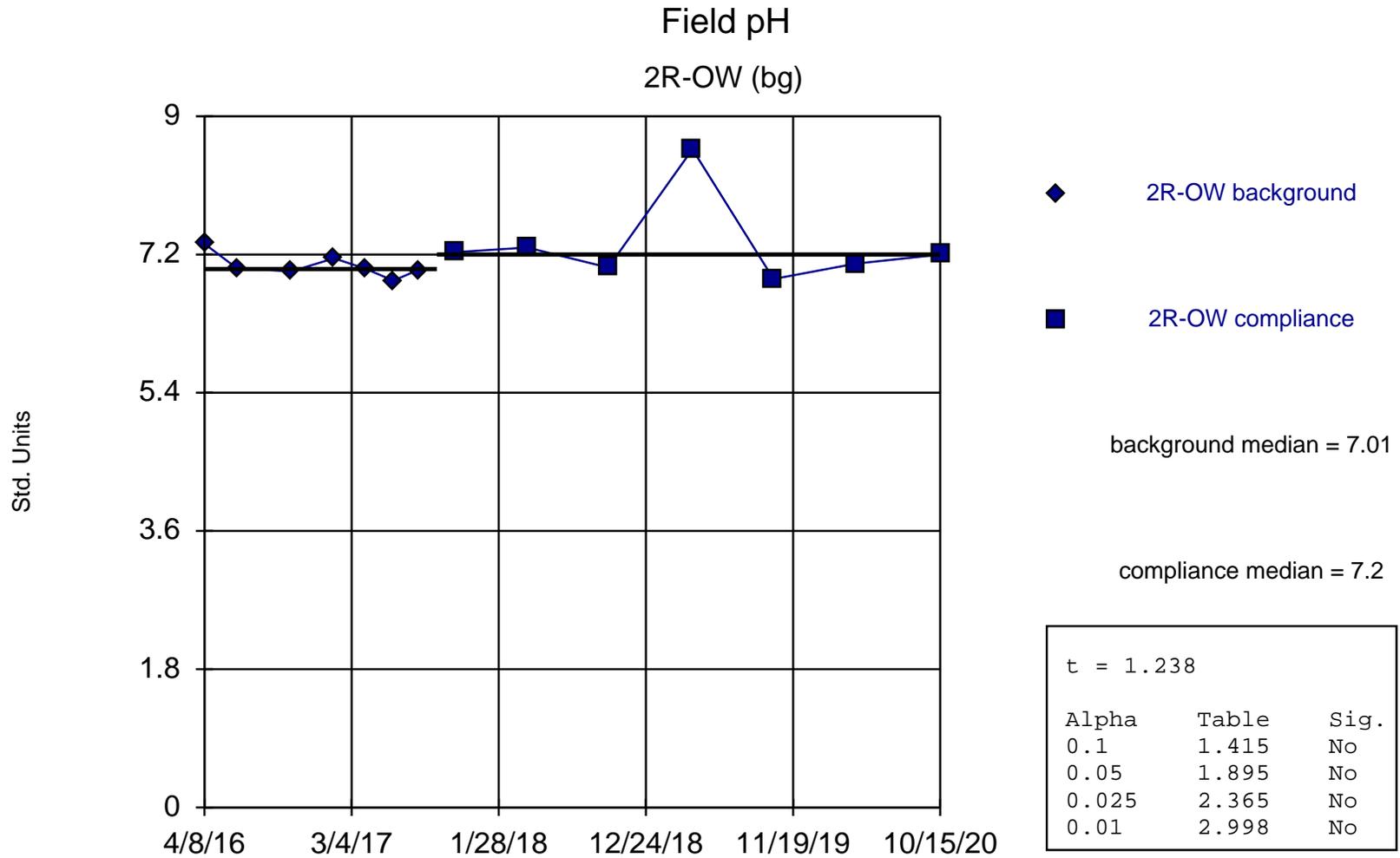
Mann-Whitney (Wilcoxon Rank Sum) Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8822, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

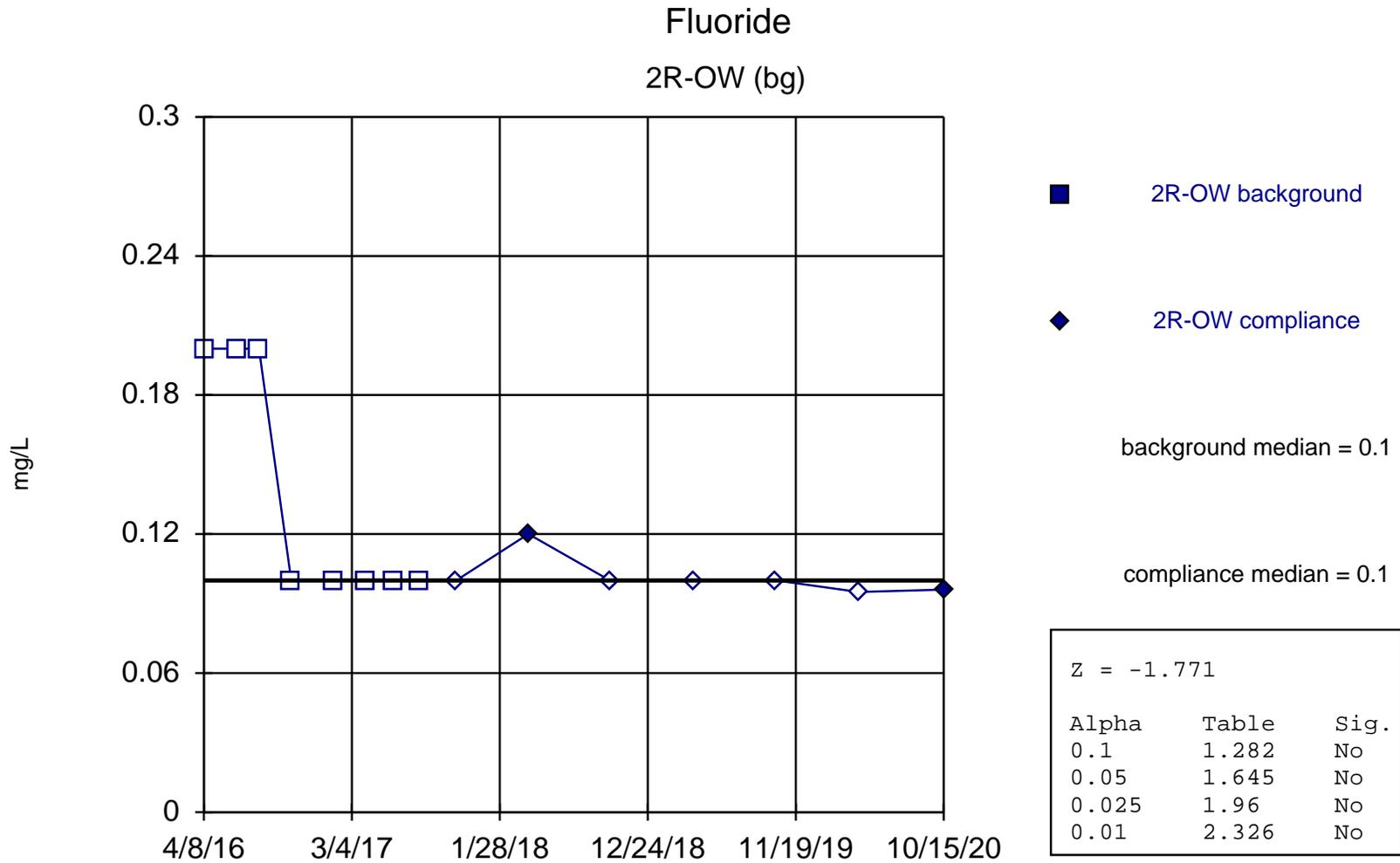


Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8921, critical = 0.803.

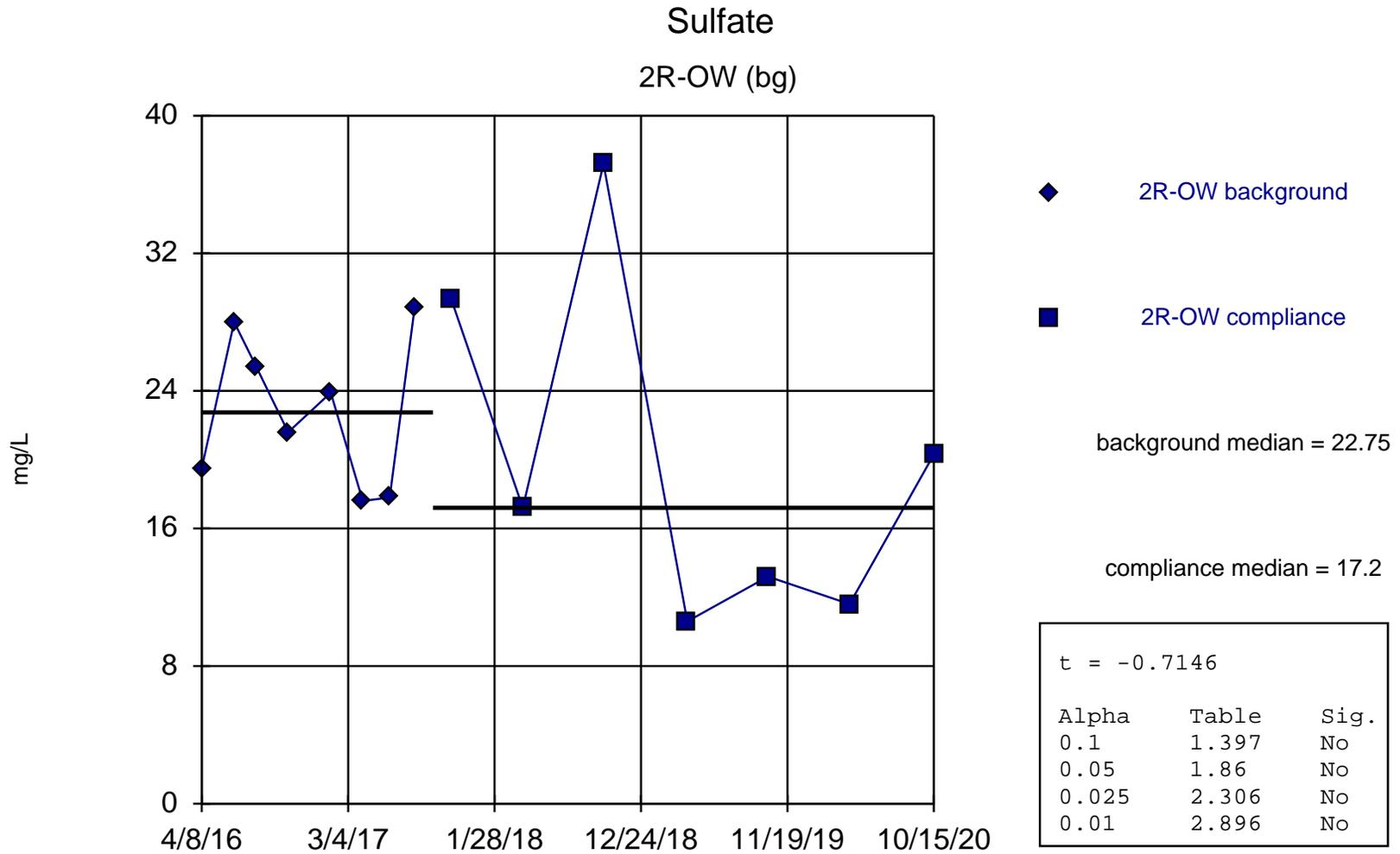
Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020





Mann-Whitney (Wilcoxon Rank Sum) used in lieu of Welch's t-test because censored data exceeded 75%.



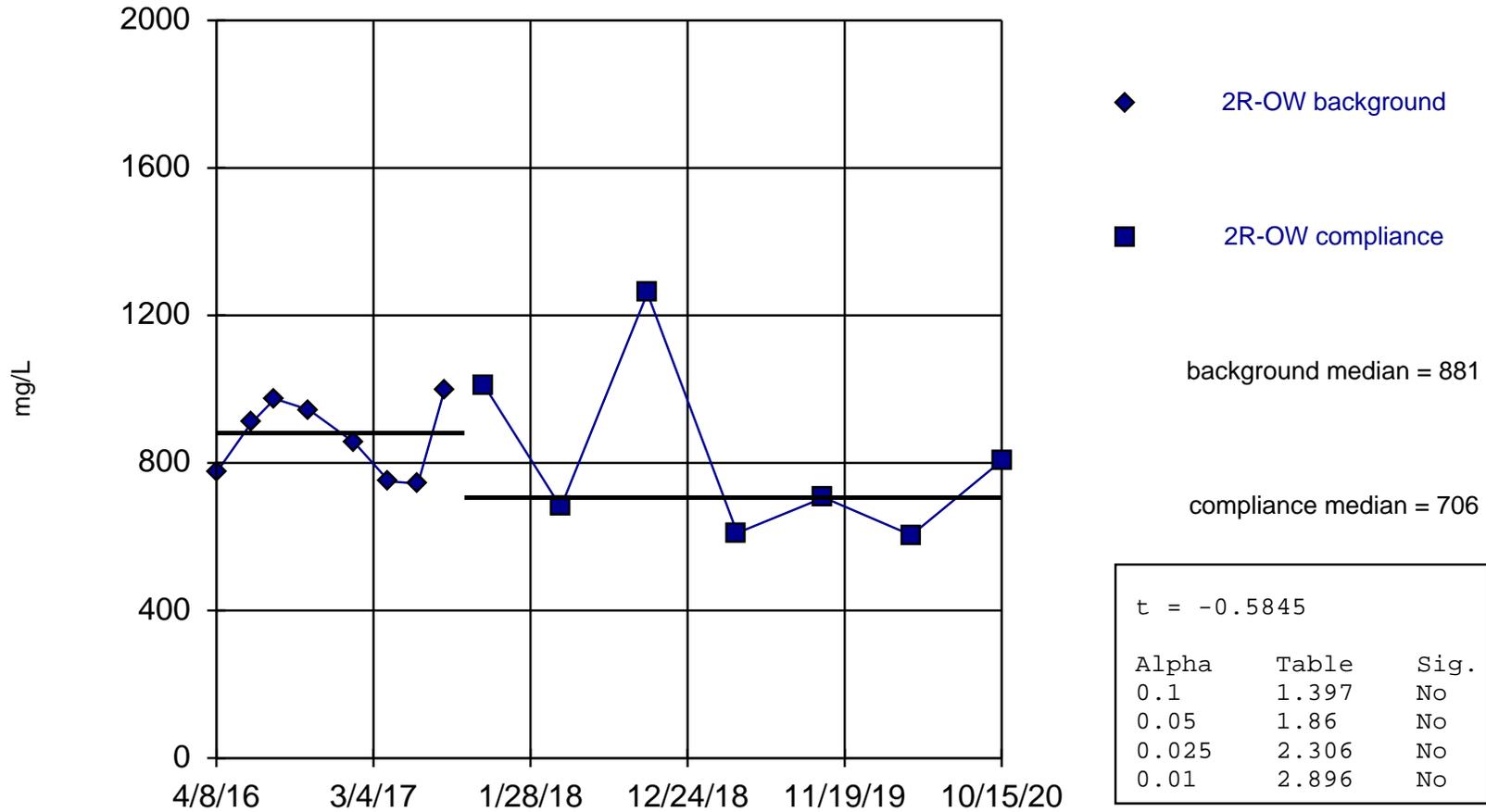
Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.9205, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

## Total Dissolved Solids

2R-OW (bg)



Normality test: Shapiro Wilk @alpha = 0.05, calculated = 0.8983, critical = 0.818.

Welch's t-test Analysis Run 1/3/2021 4:19 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

## Attachment 4

### Interwell Prediction Limit Analysis

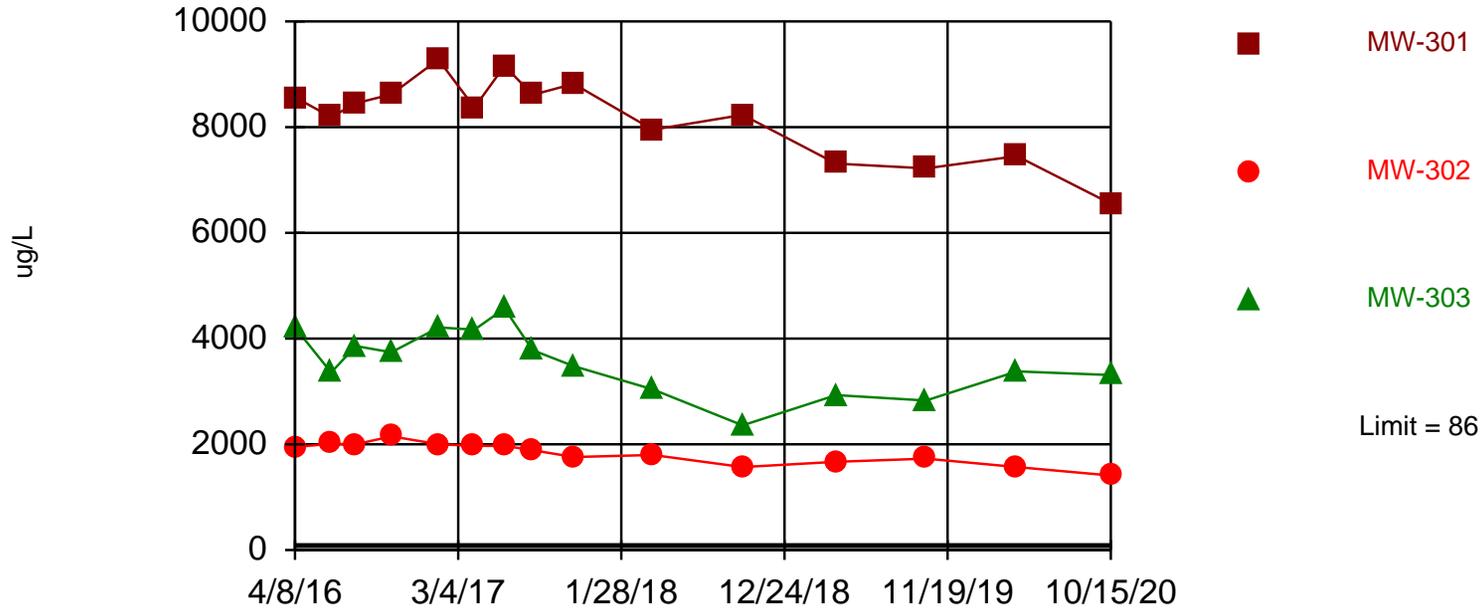
# Prediction Limit

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020 Printed 1/14/2021, 8:04 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	Bg Wells	Bg Mean	Std. Dev.	%NDs	ND Adj.	Transform	Alpha	Method
<b>Boron (ug/L)</b>	<b>MW-301</b>	<b>86</b>	<b>n/a</b>	<b>10/15/2020</b>	<b>6550</b>	<b>Yes</b>	<b>15</b>	<b>2R-OW</b>	<b>44.53</b>	<b>20.78</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.002505</b>	<b>Param Inter 1 of 2</b>
<b>Boron (ug/L)</b>	<b>MW-302</b>	<b>86</b>	<b>n/a</b>	<b>10/15/2020</b>	<b>1410</b>	<b>Yes</b>	<b>15</b>	<b>2R-OW</b>	<b>44.53</b>	<b>20.78</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.002505</b>	<b>Param Inter 1 of 2</b>
<b>Boron (ug/L)</b>	<b>MW-303</b>	<b>86</b>	<b>n/a</b>	<b>10/15/2020</b>	<b>3310</b>	<b>Yes</b>	<b>15</b>	<b>2R-OW</b>	<b>44.53</b>	<b>20.78</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.002505</b>	<b>Param Inter 1 of 2</b>
Calcium (ug/L)	MW-301	200000	n/a	10/15/2020	114000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-302	200000	n/a	10/15/2020	124000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Calcium (ug/L)	MW-303	200000	n/a	10/15/2020	132000	No	15	2R-OW	148800	25498	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-301	400	n/a	10/15/2020	13.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-302	400	n/a	10/15/2020	20.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Chloride (mg/L)	MW-303	400	n/a	10/15/2020	20.9	No	15	2R-OW	180.8	109.9	0	None	No	0.002505	Param Inter 1 of 2
Field pH (Std. Units)	MW-301	8.57	n/a	10/15/2020	7.64	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Field pH (Std. Units)	MW-302	8.57	n/a	10/15/2020	7.9	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Field pH (Std. Units)	MW-303	8.57	n/a	10/15/2020	7.11	No	14	2R-OW	n/a	n/a	0	n/a	n/a	0.008038	NP Inter (normality) ...
Fluoride (mg/L)	MW-301	0.200	n/a	10/15/2020	0.48ND	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-302	0.200	n/a	10/15/2020	1J	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
Fluoride (mg/L)	MW-303	0.200	n/a	10/15/2020	0.48ND	No	15	2R-OW	n/a	n/a	86.67	n/a	n/a	0.007081	NP Inter (NDs) 1 of 2
<b>Sulfate (mg/L)</b>	<b>MW-301</b>	<b>36.2</b>	<b>n/a</b>	<b>10/15/2020</b>	<b>293</b>	<b>Yes</b>	<b>15</b>	<b>2R-OW</b>	<b>21.47</b>	<b>7.379</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.002505</b>	<b>Param Inter 1 of 2</b>
<b>Sulfate (mg/L)</b>	<b>MW-302</b>	<b>36.2</b>	<b>n/a</b>	<b>10/15/2020</b>	<b>73.1</b>	<b>Yes</b>	<b>15</b>	<b>2R-OW</b>	<b>21.47</b>	<b>7.379</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.002505</b>	<b>Param Inter 1 of 2</b>
Sulfate (mg/L)	MW-303	36.2	n/a	10/15/2020	2.2ND	No	15	2R-OW	21.47	7.379	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-301	1190	n/a	10/15/2020	678	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-302	1190	n/a	10/15/2020	182	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2
Total Dissolved Solids (mg/L)	MW-303	1190	n/a	10/15/2020	620	No	15	2R-OW	841.6	177.2	0	None	No	0.002505	Param Inter 1 of 2

Exceeds Limit: MW-301, MW-302, MW-303

### Boron Interwell Parametric



Background Data Summary: Mean=44.53, Std. Dev.=20.78, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8829, critical = 0.835. Kappa = 1.994 (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.

Prediction Limit Analysis Run 1/14/2021 8:01 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Prediction Limit

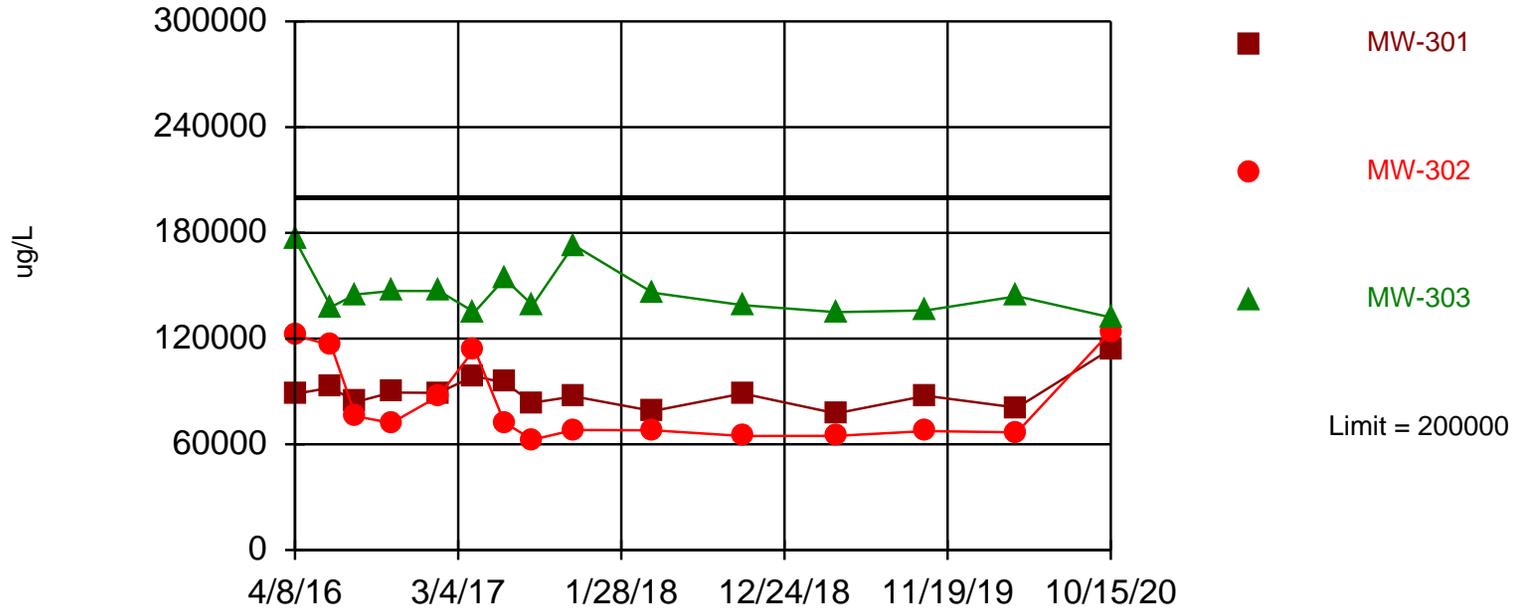
Constituent: Boron (ug/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

	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

Within Limit

# Calcium

## Interwell Parametric



Background Data Summary: Mean=148800, Std. Dev.=25498, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9279, critical = 0.835. Kappa = 1.994 (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.

Prediction Limit Analysis Run 1/14/2021 8:01 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020



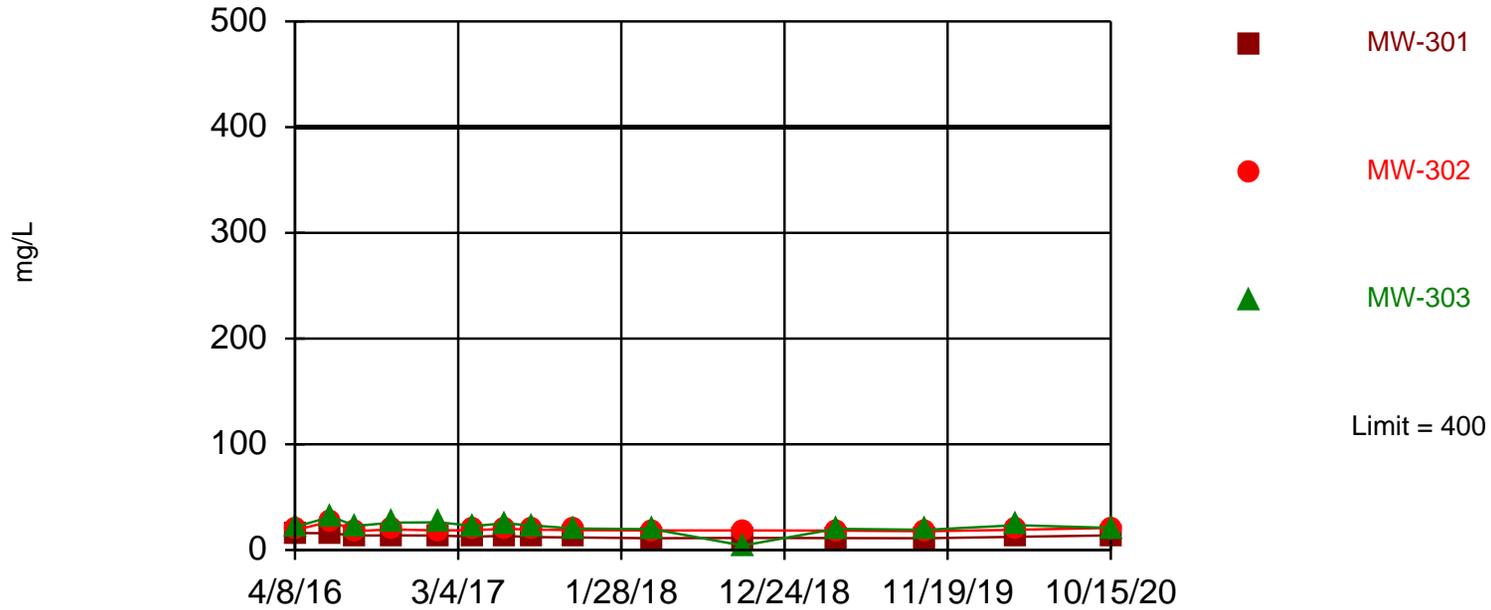
# Prediction Limit

Constituent: Calcium (ug/L) Analysis Run 1/14/2021 8:04 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

Within Limit

### Chloride Interwell Parametric



Background Data Summary: Mean=180.8, Std. Dev.=109.9, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.8933, critical = 0.835. Kappa = 1.994 (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.

Prediction Limit Analysis Run 1/14/2021 8:01 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

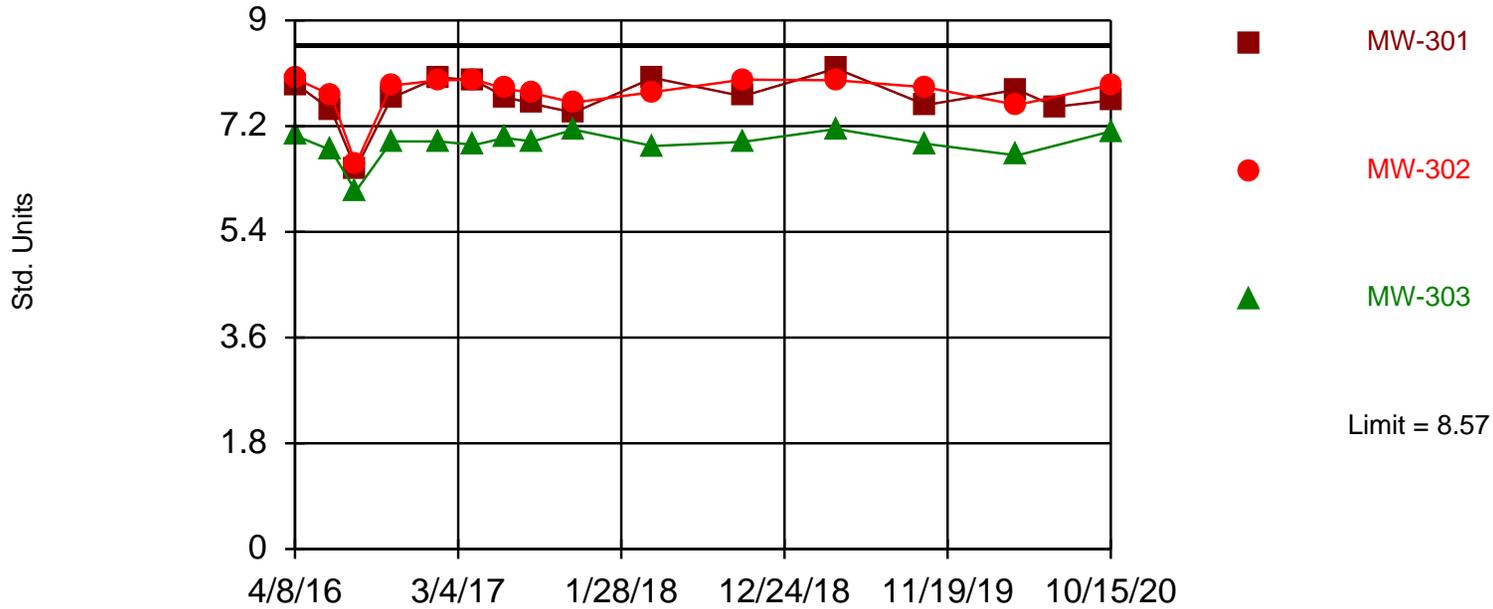
# Prediction Limit

Constituent: Chloride (mg/L) Analysis Run 1/14/2021 8:04 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

Within Limit

### Field pH 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 14 background values. Annual per-constituent alpha = 0.04727. Individual comparison alpha = 0.008038 (1 of 2). Comparing 3 points to limit.

Prediction Limit Analysis Run 1/14/2021 8:01 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Prediction Limit

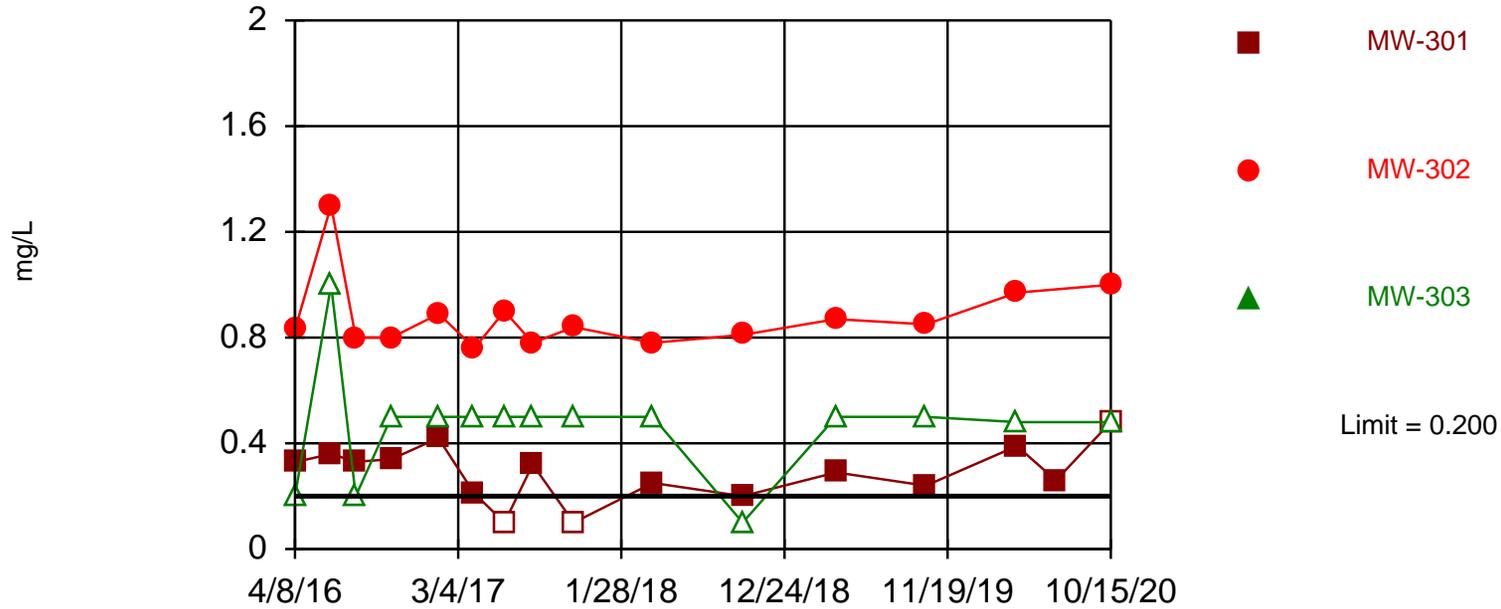
Constituent: Field pH (Std. Units) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

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

Within Limit

## Fluoride

### Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 15 background values. 86.67% NDs. Annual per-constituent alpha = 0.04174. Individual comparison alpha = 0.007081 (1 of 2). Comparing 3 points to limit.

Prediction Limit Analysis Run 1/14/2021 8:02 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

# Prediction Limit

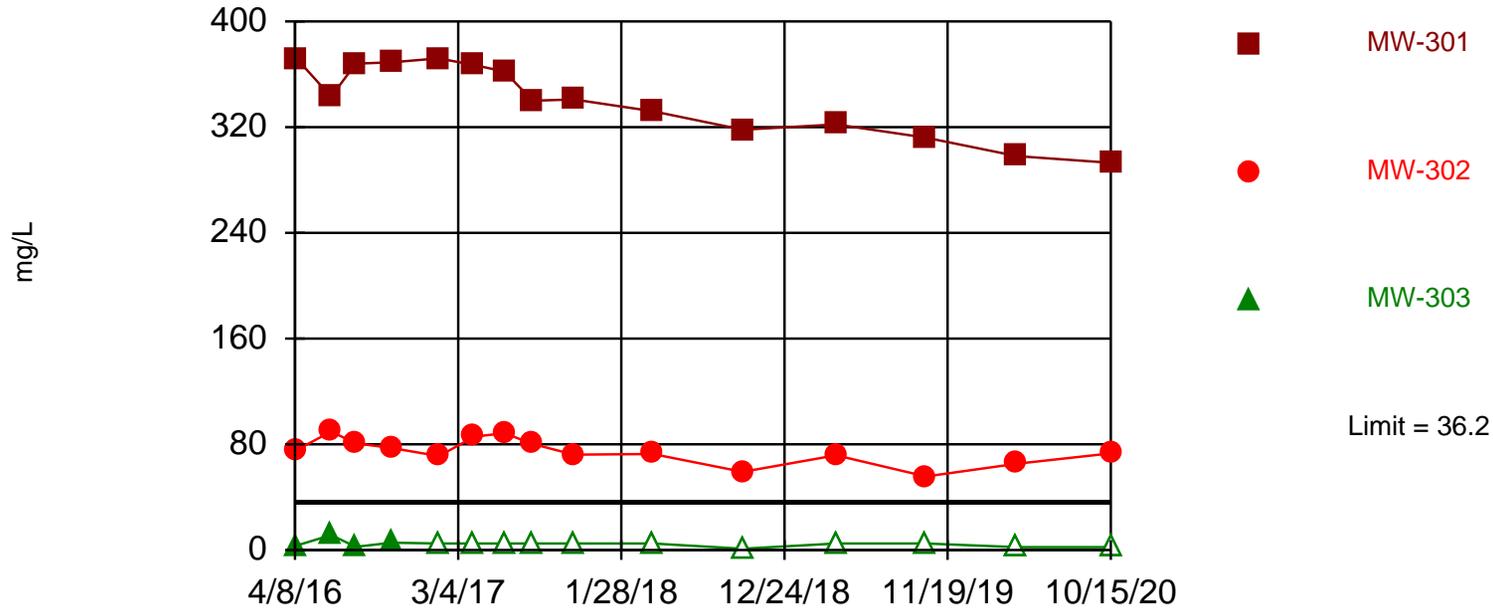
Constituent: Fluoride (mg/L) Analysis Run 1/14/2021 8:04 PM View: CCR - UPL - 2020  
Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020

	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)

Exceeds Limit: MW-301, MW-302

## Sulfate

### Interwell Parametric



Background Data Summary: Mean=21.47, Std. Dev.=7.379, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9672, critical = 0.835. Kappa = 1.994 (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.

Prediction Limit Analysis Run 1/14/2021 8:02 PM View: CCR - UPL - 2020

Edgewater Closed Generating Station Client: SCS Engineers Data: EDG\_Clsd - Chem- export-Dec2020



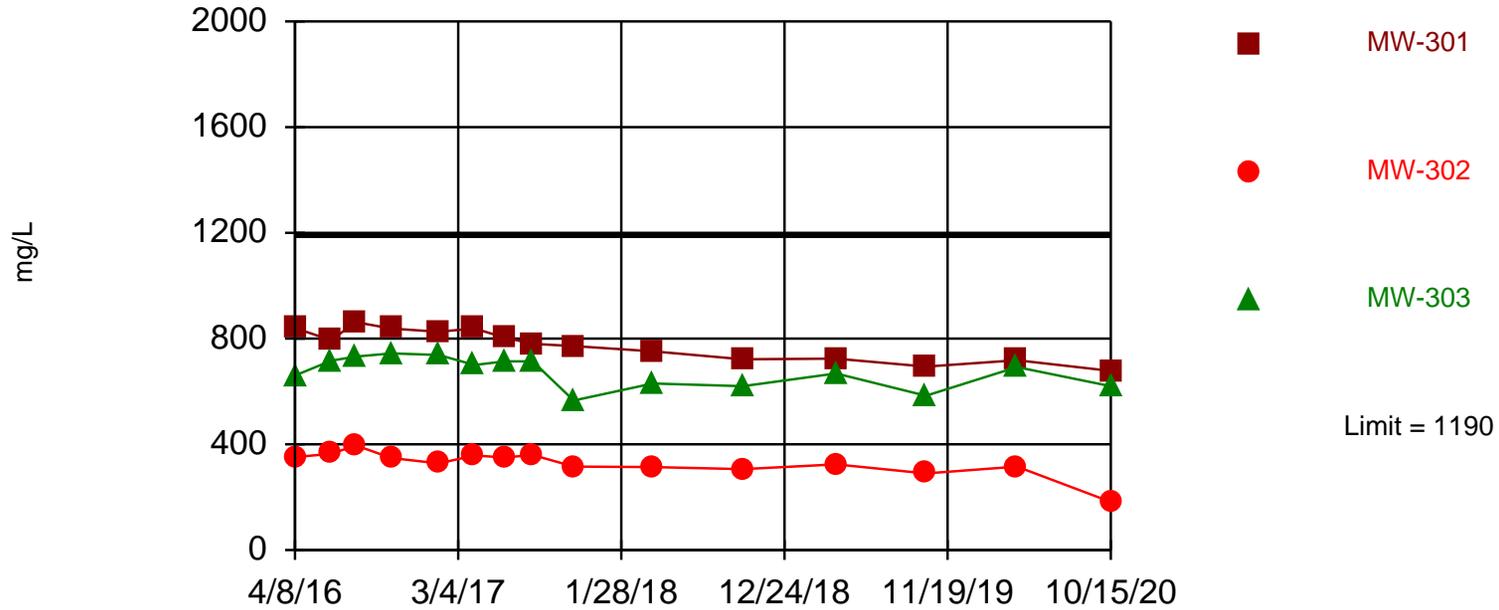
# Prediction Limit

Constituent: Sulfate (mg/L) Analysis Run 1/14/2021 8:04 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

Within Limit

### Total Dissolved Solids Interwell Parametric



Background Data Summary: Mean=841.6, Std. Dev.=177.2, n=15. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.9458, critical = 0.835. Kappa = 1.994 (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.

Prediction Limit Analysis Run 1/14/2021 8:02 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 1/14/2021 8:04 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

## Appendix F

### Alternative Source Demonstrations (ASDs)

F1	October 2019 ASD
F2	April 2020 ASD

F1 October 2019 ASD

# Alternative Source Demonstration October 2019 Detection Monitoring

Edgewater Generating Station  
Sheboygan, Wisconsin

Prepared for:



**SCS ENGINEERS**

25219068.00 | April 14, 2020

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

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# PE CERTIFICATION

	<p>I, Sherren Clark, hereby certify that that the information in this alternate source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Edgewater Generating Station Ash Ponds. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.</p>
	<p style="text-align: center;"><i>SC Clark</i> <span style="float: right;">4-13-2020</span></p> <p>(signature) <span style="float: right;">(date)</span></p>
	<p style="text-align: center;"><i>Sherren Clark</i></p> <p>(printed or typed name)</p>
	<p>License number E-29863</p> <p>My license renewal date is July 31, 2020.</p>
	<p>Pages or sheets covered by this seal:          Alternative Source Demonstration - October 2019 Detection          Monitoring, Edgewater Generating Station, Sheboygan Wisconsin          (Entire Document)</p>

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## 1.0 INTRODUCTION

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

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

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

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

This ASD report is evaluating the SSIs observed in the statistical evaluation of the October 2019 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, field pH, 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 2019 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. EDG has four existing 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)

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 as **Figure 2**.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the ponds. 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<sup>2</sup>, 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, field pH, and sulfate at one or more wells based on the October 2019 detection monitoring event. A summary of the October 2019 constituent concentrations and the established benchmark concentrations is 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, field pH, and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the October 2019 detection monitoring event was included in the 2019 annual groundwater monitoring and corrective action report submitted in January 2020. 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, 2018b).

## 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 slight 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 October 2019 detection monitoring event. The water table map shows a generally southward flow direction, with localized groundwater mounding in the area of the EDG ponds. The groundwater elevations at the CCR wells during the October 2019 detection monitoring event are in **Table 3**.

### 3.0 METHODOLOGY AND ANALYSIS REVIEW

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

#### 3.1 SAMPLING AND FIELD ANALYSIS 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 other 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.

The field pH trend plots were also reviewed for any anomalous results that might indicate a possible sampling or field analysis error (e.g., calibration error or incorrect sample identification). The time series plots are provided in **Appendix A**. The field pH results reported for all wells for the August 2016 background monitoring event were anomalously low, which is most likely due to a calibration error or other problem with the field pH meter for that event. During the statistical evaluation of the background data from well 2R-OW to develop the Upper Prediction Limit (UPL) for field pH, the August 2016 field pH result was identified as an outlier and was not used in the UPL calculation. Although the compliance wells also had outlier pH results for August 2016, the anomalous results for those wells were not considered when evaluating SSI determinations for the October 2019 detection monitoring, because an interwell analysis was used for the SSI evaluation, comparing current compliance well results to UPLs based on background well results.

The field pH result for background well 2R-OW was anomalously high during the previous sampling event in the April 2019 sampling, and the October 2019 pH result is similar to historical results. The April 2019 result may be a product of a potential measurement error or due to natural variation. This result does not affect the statistical evaluation because the current background data set only includes results through October 2017. The result will be evaluated as a possible outlier when the background data set is updated in the future.

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 2019 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 2019 boron, fluoride, pH, and sulfate results for 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 2019 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 2019 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, sulfate, and field pH 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, sulfate, and field pH.

### **4.1 POTENTIAL CAUSES OF SSI**

#### **4.1.1 Natural Variation**

The statistical analysis was completed using an interwell approach, comparing the October 2019 detection monitoring results to the UPLs calculated based on 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 contributed to the SSIs for pH at MW-301 and MW-302. The UPL was calculated based on pH results at background well 2R-OW for the eight CCR Rule background monitoring events and the October 24, 2017, detection monitoring event. Based on these results the calculated UPL was 7.47, and the reported pH at MW-301 was 7.56 and at MW-302 was 7.86. Although the results exceed the UPL, the historical pH results for 2R-OW include pH values up to 7.98, indicating variability in the background. This suggests that the SSIs for pH may be partially or completely due to natural variation.

Natural variation may also 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 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 October 2019 were just above the laboratory's limit of quantitation (LOQ), at 0.84 mg/L in October 2017, 0.78 mg/L in April 2018, 0.81 mg/L in October 2018, 0.87 mg/L in April 2019, and 0.85 mg/L in October 2019. These results are within the range of reported natural concentrations, indicating that the fluoride concentration observed in this well is likely 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, pH, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on the groundwater flow directions and on 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 EVIDENCES**

The lines of evidence indicating that the SSIs for boron, sulfate, and field pH 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, sulfate, and elevated pH are all 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 pH 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<sup>2</sup> in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT<sup>2</sup>, 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. 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, sulfate, and pH, 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 WPDES lagoons (North Pond A and South Pond A) were constructed, is 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. Additionally, 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, fluoride, and pH in comparison to the slag composite sample.
- 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. 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 micrograms per liter (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, sulfate, and elevated pH are all present in the CCR landfill leachate. Recent groundwater and leachate monitoring results for boron, sulfate, and pH in samples from the state monitoring program wells are summarized in **Table 4** (April 2016 through October 2019). 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.

**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.

**Field pH:** Field pH results for the three leachate head wells continue to have pH measurements that are slightly higher than the pH UPL calculated from the well 2R-OW background data. Thirteen of the 24 leachate field pH readings for April 2016 through October 2019 were higher than the calculated UPL. While slightly higher pH values were reported for the CCR well samples in October 2019, the range of pH values for the CCR compliance wells has generally been similar to recent pH results for leachate wells 37-OW and 38R-OW. Historically pH values at leachate head well 39R-OW were in the range of 8 to 9, but pH has followed a gradual decreasing trend at this well since routine monitoring began in 1994.

**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**). Three of the four historic fluoride results from leachate head well 39R-OW exceed the April 2019 fluoride concentration for MW-302.

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

### **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 and sulfate are in monitoring wells downgradient from the landfill, including 18-OW (recently replaced by 40-OW) and 29-OW. Elevated boron and sulfate also continue to be reported for samples from wells 4-OW and 5-OW, located near the southwest and northwest corners of the landfill.

## **5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS**

The lines of evidence discussed above regarding the SSIs reported for boron, pH, 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. The SSIs for fluoride and pH at MW-301 (pH only) and MW-302 may also be partially due to natural variability within the glacial sediment aquifer.

## **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 2020 Annual Report due January 31, 2021.

## **7.0 REFERENCES**

BT<sup>2</sup>, Inc., 1993, Field Investigation Report, Edgewater Closed Ash Disposal Facility, Wisconsin Power & Light Company, WDNR License #2524, June 1993.

Kammerer, 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.

Luczaj, J., and Masarik, K, 2015, Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA: Resources, 2015, 4, 323-357.

RMT, Inc., 1997, Groundwater Assessment Report, Edgewater Closed Ash Disposal Facility, September 30, 1997.

SCS Engineers, 2016, Biennial Groundwater Monitoring Report for 2014-2015, Wisconsin Power and Light Company – Edgewater 1-4 (Closed) Ash Disposal Facility, Sheboygan, WI, License #02524, March 2016.

SCS Engineers, 2018a, 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station, January 2018.

SCS Engineers, 2018b, Alternative Source Demonstration, October 2017 Monitoring Event, Edgewater Generating Station, April 2018.

SCS Engineers, 2019, 2018 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station, January 2019.

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. Environmental Protection Agency, 2015, Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule. April 2015.

## Tables

- 1 Groundwater Analytical Results Summary - CCR Program - Detection Monitoring
- 2 Analytical Results – CCR Ponds Detection Monitoring Program
- 3 Groundwater Elevations – CCR Rule Monitoring Wells
- 4 Groundwater Analytical Results – Closed Landfill State Monitoring Program Wells
- 5 Analytical Results – Closed Landfill Leachate Fluoride Monitoring

**Table 1. Groundwater Analytical Results Summary - CCR Program - Detection Monitoring  
Edgewater Generating Station / SCS Engineers Project #25220068.00**

Parameter Name	UPL	Background Well	Compliance Wells		
		2R-OW	MW-301	MW-302	MW-303
		10/7/2019	10/7/2019	10/7/2019	10/7/2019
<b>Appendix III</b>					
Boron, µg/L	107	58.8	7,220 P6	1,730	2,830
Calcium, µg/L	206,247	132,000	87,600 P6	67,500	136,000
Chloride, mg/L	378	88.8	11.1	17.8	19.1
Fluoride, mg/L	DQ	<0.10	0.24 J	0.85	<0.50 D3
Field pH, Std. Units	7.47	6.88	7.56	7.86	6.90
Sulfate, mg/L	35	13.2	312	55.7	<5.0 D3
Total Dissolved Solids, mg/L	1,145	706	694	290	584

**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      LOD = Limit of Detection      mg/L = milligrams per liter  
DQ= Double Quantification      LOQ = Limit of Quantitation      µg/L = micrograms per liter  
Rule(Not detected in Background).

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

DQ = Double quantification rule applies (not detected in background).

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. UPLs calculated based on results from background well 2R-OW.

Created by: NDK      Date: 5/1/2018  
Last revision by: LMH      Date: 11/12/2019  
Checked by: AJR      Date: 11/12/2019  
Scientist/PM QA/QC: MDB      Date: 11/12/2019

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**Table 2. Analytical Results - CCR Ponds Detection Monitoring Program  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

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 U	19.5
		6/20/2016	22.4	7.02	<0.20 U	28.0
		8/9/2016	32.6	6.10	<0.20 U	25.4
		10/20/2016	43.1	6.98	<0.10 U	21.6
		1/24/2017	31.2	7.15	<0.10 U	23.9
		4/6/2017	70.6	7.01	<0.10 U	17.6
		6/6/2017	45.2	6.86	<0.10 U	17.8
		8/1/2017	35.7	7.00	<0.10 U	28.8
		10/23/2017	55.9	7.23	<0.10 U	29.3
		4/2/2018	19.7	7.29	0.12 J	17.2
		10/1/2018	34.7	7.03	<0.10 U	37.2
		4/8/2019	35.8	8.57	<0.10 U	10.6
10/7/2019	59	6.88	<0.10 U	13.2		
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 U	362
		8/2/2017	8,610	7.58	0.32	340
		10/24/2017	8,820	7.43	<0.10 U	341
		4/2/2018	7,950	8.02	0.25 J	332
		10/1/2018	8,230	7.71	0.2 J	318
		4/8/2019	7,310	8.18	0.29 J	322
	10/7/2019	7,220	7.56	0.24 J	312	
	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	0.8	80.7
		10/20/2016	2,150	7.89	0.8	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	
	MW-303	4/8/2016	4,210	7.04	<0.20 U	3 J
		6/20/2016	3,360	6.79	<1.0 U	11.4 J
		8/9/2016	3,860	6.09	<0.20 U	2.4 J
		10/20/2016	3,740	6.94	<0.50 U	5.6 J
		1/24/2017	4,210	6.94	<0.50 U	<5 U
		4/6/2017	4,170	6.88	<0.50 U	<5 U
		6/6/2017	4,570	7.00	<0.50 U	<5 U
8/2/2017		3,780	6.94	<0.50 U	<5 U	
10/24/2017		3,480	7.14	<0.50 U	<5 U	
4/2/2018		3,040	6.86	<0.50 U	<5 U	
10/1/2018		2,360	6.93	<0.10 U	<1.0 U	
4/8/2019		2,930	7.15	<0.50 U	<5.0 U	
10/7/2019	2,830	6.9	<0.50 U	<5.0 U		

**Table 2. Analytical Results - CCR Ponds Detection Monitoring Program  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

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)

U = Not detected

Notes:

1. Complete laboratory reports included in 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station.

Created by:	<u>NDK</u>	Date:	<u>3/2/2018</u>
Last revision by:	<u>NDK</u>	Date:	<u>4/1/2020</u>
Checked by:	<u>TK</u>	Date:	<u>4/2/2020</u>

\\Mad-fs01\data\Projects\25220068.00\Data and Calculations\Tables\ASD Tables\[EDG-closed-Tables 2,3,4.xlsx]Table 2.  
CCR Analytical



**Table 3. Groundwater Elevations - CCR Rule Monitoring Wells  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

Ground Water Elevation in feet above mean sea level (amsl)				
Well Number	MW-301	MW-302	MW-303	2R-OW
<b>Top of Casing Elevation (feet amsl)</b>	604.42	615.15	611.99	612.72
<b>Screen Length (ft)</b>	5.00	5.00	5.00	10.00
<b>Total Depth (ft from top of casing)</b>	27.47	40.00	33.26	14.50
<b>Top of Well Screen Elevation (ft)</b>	581.95	580.15	583.73	608.22
<b>Measurement Date</b>				
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
June 6, 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
<b>Bottom of Well Elevation (ft)</b>	576.95	575.15	578.73	598.22

Notes:

Groundwater elevations compiled from field notes during sampling events.

-- = not measured

Created by:	<u>NDK</u>	Date:	<u>2/28/2018</u>
Last rev. by:	<u>NDK</u>	Date:	<u>3/22/2020</u>
Checked by:	<u>AJR</u>	Date:	<u>3/23/2020</u>

I:\25220068.00\Data and Calculations\Tables\ASD Tables\[EDG-closed-Tables 2,3,4.xlsx]Table 3. GW elev - CCR

**Table 4. 2016-2019 Groundwater Analytical Results - Closed Landfill State Monitoring Program Wells  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

Point Name	Reporting Period	ph-Field (standard units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO <sub>4</sub> )
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
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	7.7	337	279
3R-OW	2019-Oct	6.45	454	299
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	8630	129
4R-OW	2019-Apr	6.67	10200	158
4R-OW	2019-Oct	7.51	9,200	161
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
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	1,150	218
7-OW	2019-Apr	7.85	914	254
7-OW	2019-Oct	7.47	1,200	224

**Table 4. 2016-2019 Groundwater Analytical Results - Closed Landfill State Monitoring Program Wells  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

Point Name	Reporting Period	ph-Field (standard units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO <sub>4</sub> )
Monitoring Wells (continued)				
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-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
29-OW	2017-Oct	8.15	9,060	62
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
30-OW	2016-Apr	8.26	79	4.8
30-OW	2016-Oct	7.56	113	4.6
30-OW	2017-Apr	8.47	176	7.5
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	2.4 J
30-OW	2019-Oct	7.37	84.9	5.6
31-OW	2016-Apr	7.63	114	91.2
31-OW	2016-Oct	7.68	35	63.3
31-OW	2017-Apr	7.99	77	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
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	6.8	8620	636
40-OW	2019-Oct	7.53	10,600	836

**Table 4. 2016-2019 Groundwater Analytical Results - Closed Landfill State Monitoring Program Wells  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

Point Name	Reporting Period	ph-Field (standard units)	Boron, dissolved (µg/L as B)	Sulfate, dissolved (mg/L as SO <sub>4</sub> )
<b>Leachate Monitoring Wells</b>				
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
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
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	7.76	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

Abbreviations:

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

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

Laboratory Notes:

J: Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Created by: SCC  
 Last revision by: NDK  
 Checked by: AJR

Date: 2/24/2014  
 Date: 3/22/2020  
 Date: 3/23/2020

I:\25220068.00\Data and Calculations\Tables\ASD Tables\[EDG-closed-Tables 2,3,4.xlsx]Table 4. GW quality Data

**Table 5. Analytical Results - Closed Landfill Leachate Fluoride Monitoring  
Edgewater Generating Station, Sheboygan, Wisconsin  
SCS Engineers Project #25220068.00**

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.

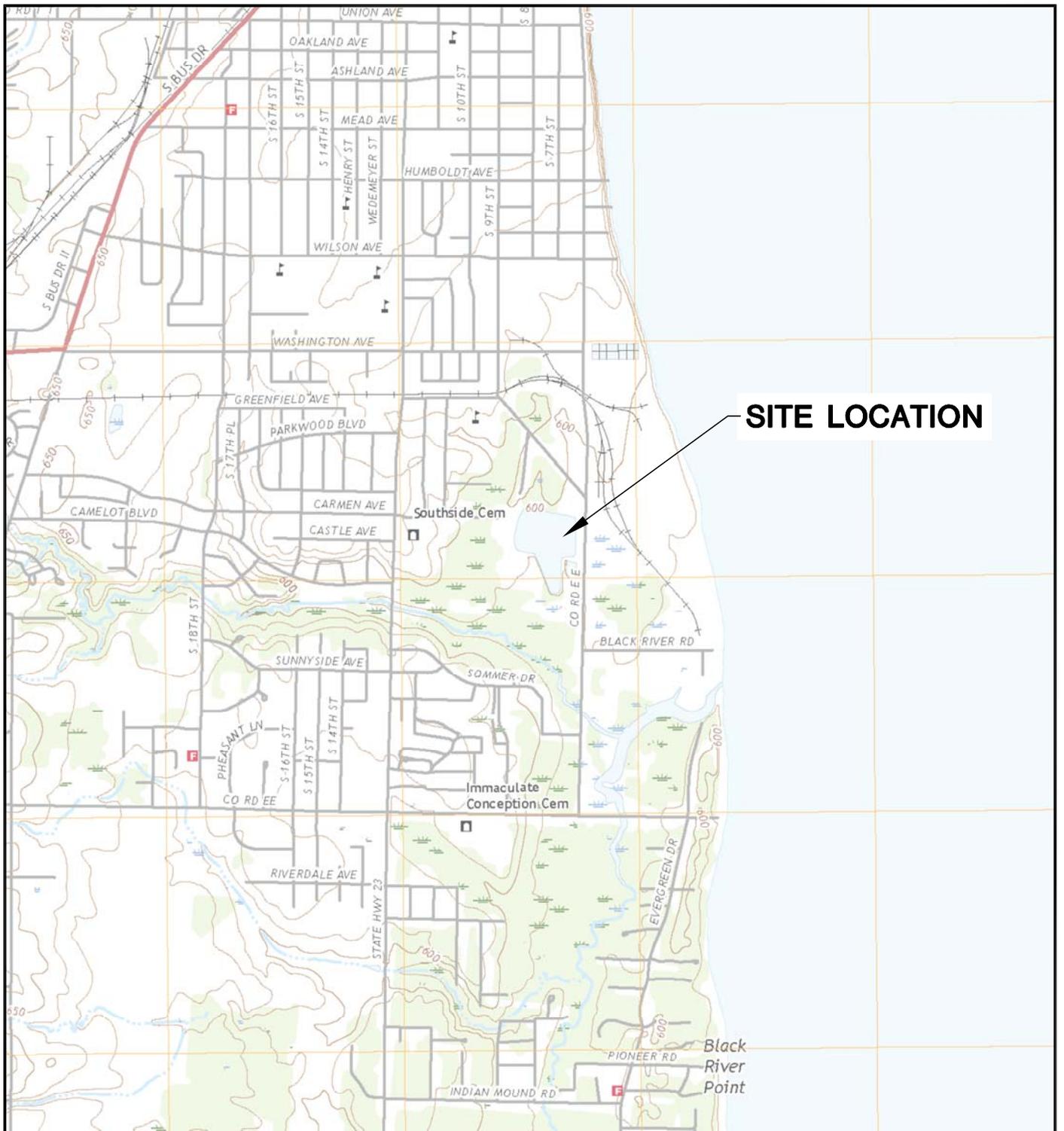
Created by: NDK  
 Last revision by: NDK  
 Checked by: AJR

Date: 3/5/2018  
 Date: 3/5/2018  
 Date: 4/5/2018

I:\25220068.00\Data and Calculations\Tables\ASD Tables\[EDG-closed-Tables 2,3,4.xlsx]Table 5- FI results

## Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Water Table Map - October 2019



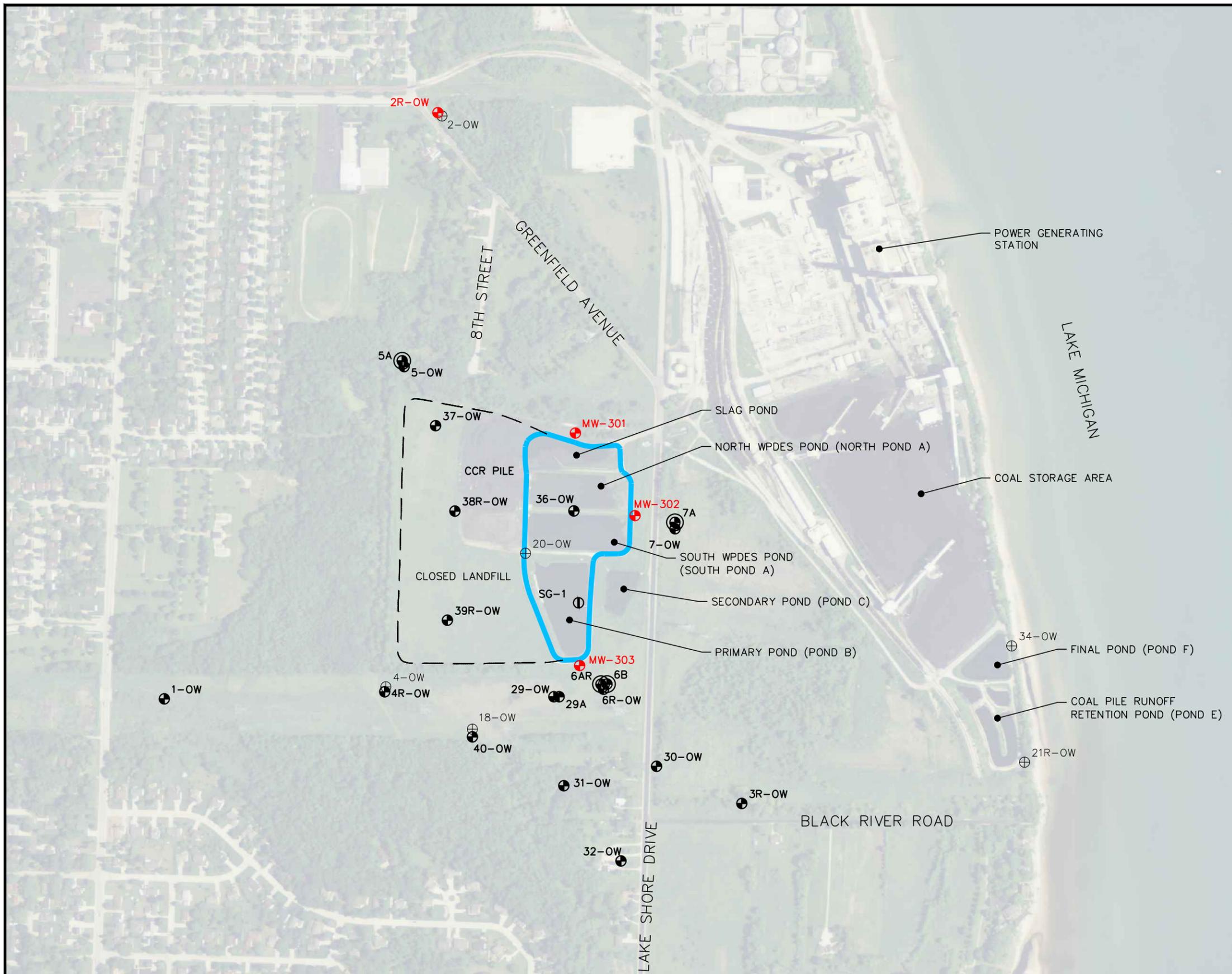
**SITE LOCATION**



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	ALLIANT ENERGY EDGEWATER GENERATING STATION SHEBOYGAN, WI		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25220068.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	11/20/19	CHECKED BY:	MDB	APPROVED BY:	TK 04/10/2020			
REVISED:	11/20/19							

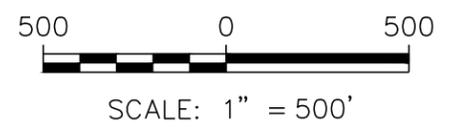


LEGEND

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

NOTES:

1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
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.



PROJECT NO.	25220068.00	DRAWN BY:	BSS
DRAWN:	11/20/2019	CHECKED BY:	MDB
REVISED:	01/09/2020	APPROVED BY:	TK 04/10/2020

**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  
 ALLIANT ENERGY  
 EDGEWATER GENERATING STATION  
 SHEBOYGAN, WI

SITE PLAN AND MONITORING WELL LOCATIONS

FIGURE  
 2

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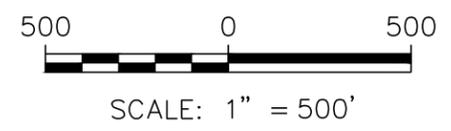




LEGEND

- ABANDONED MONITORING WELL
- MONITORING WELL
- PIEZOMETER
- CCR UNITS
- CLOSED LANDFILL LIMITS
- DESIGN MANAGEMENT ZONE
- 598.54** WATER TABLE ELEVATION (OCTOBER 9-10, 2019)
- WATER TABLE CONTOUR (5' INTERVAL)
- APPROXIMATE GROUNDWATER FLOW DIRECTION

- NOTES:
1. AERIAL PHOTOGRAPH FROM THE NATIONAL AGRICULTURE IMAGERY PROGRAM AND PUBLISHED BY THE USDA FSA AERIAL PHOTOGRAPHY FIELD OFFICE. DATE OF IMAGE IS OCTOBER 1, 2013.
  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 WDRN-APPROVED SITE-SPECIFIC MONITORING PLAN.



PROJECT NO.	25220068.00	DRAWN BY:	KP/BSS
DRAWN:	02/10/2020	CHECKED BY:	TK
REVISED:	04/10/2020	APPROVED BY:	TK 04/10/2020

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

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

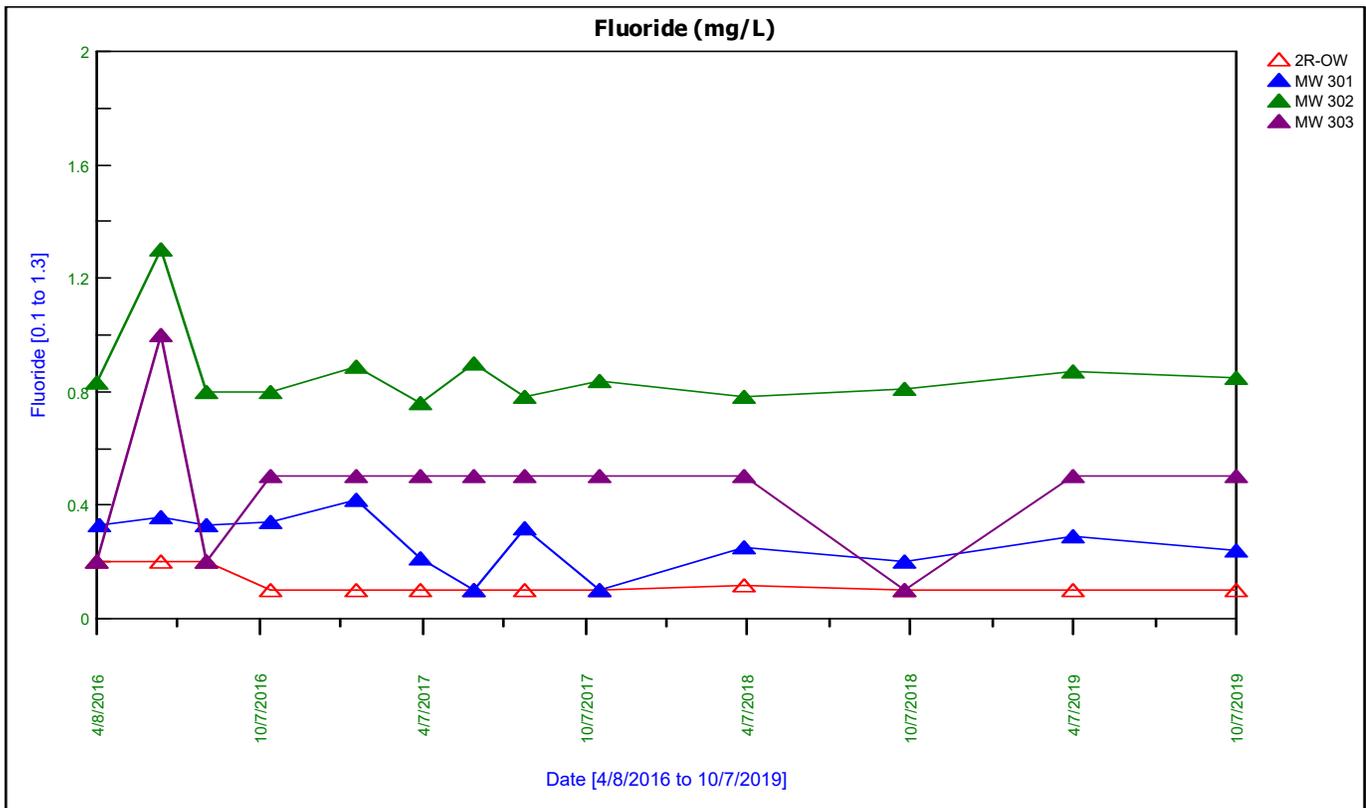
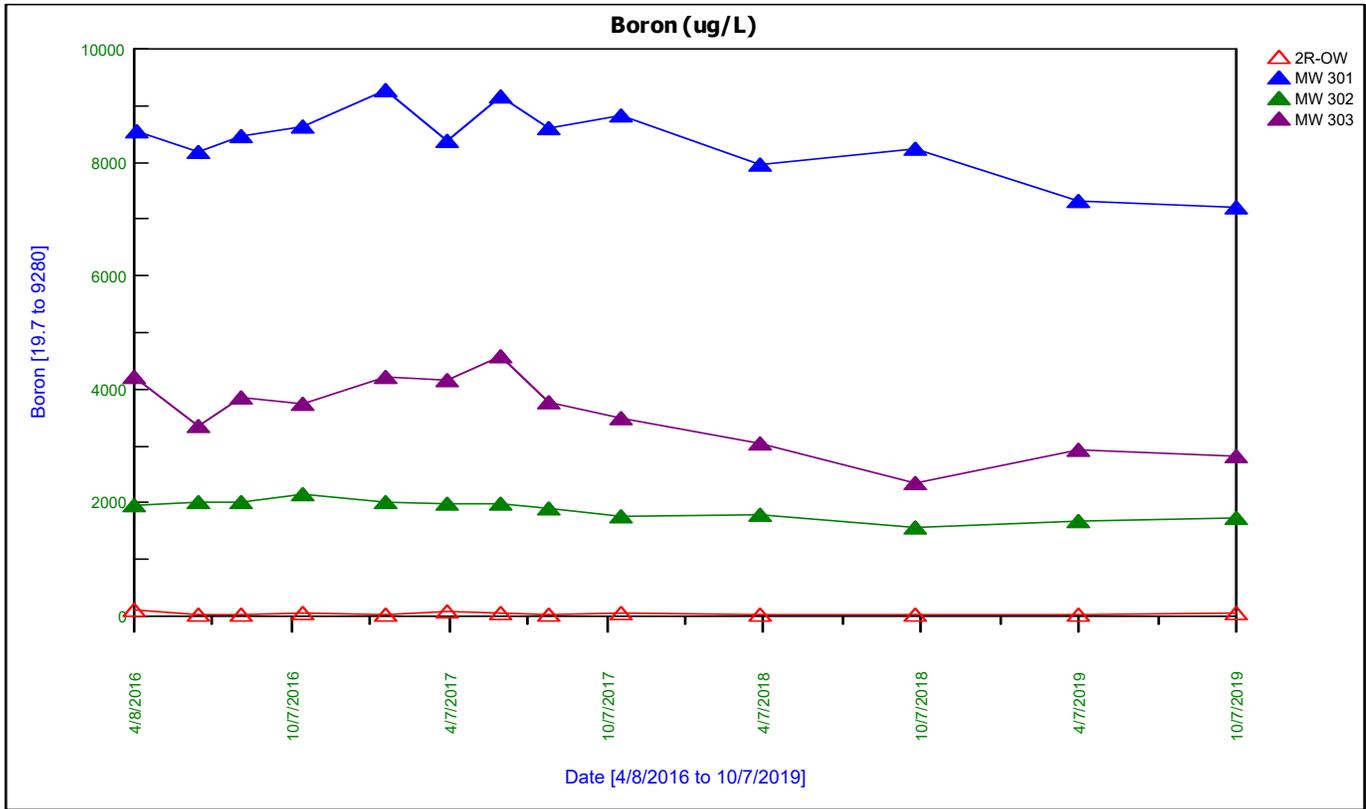
WATER TABLE MAP  
 OCTOBER 2019

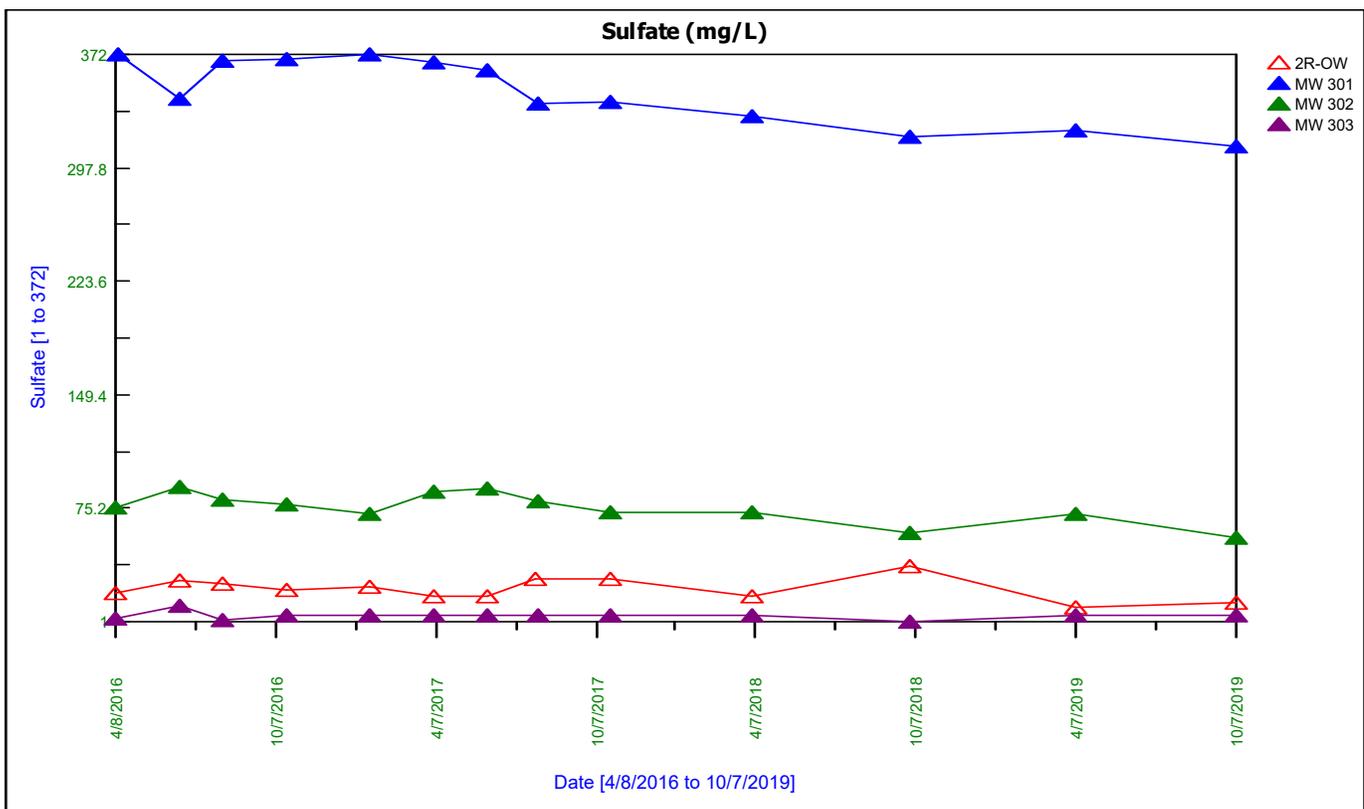
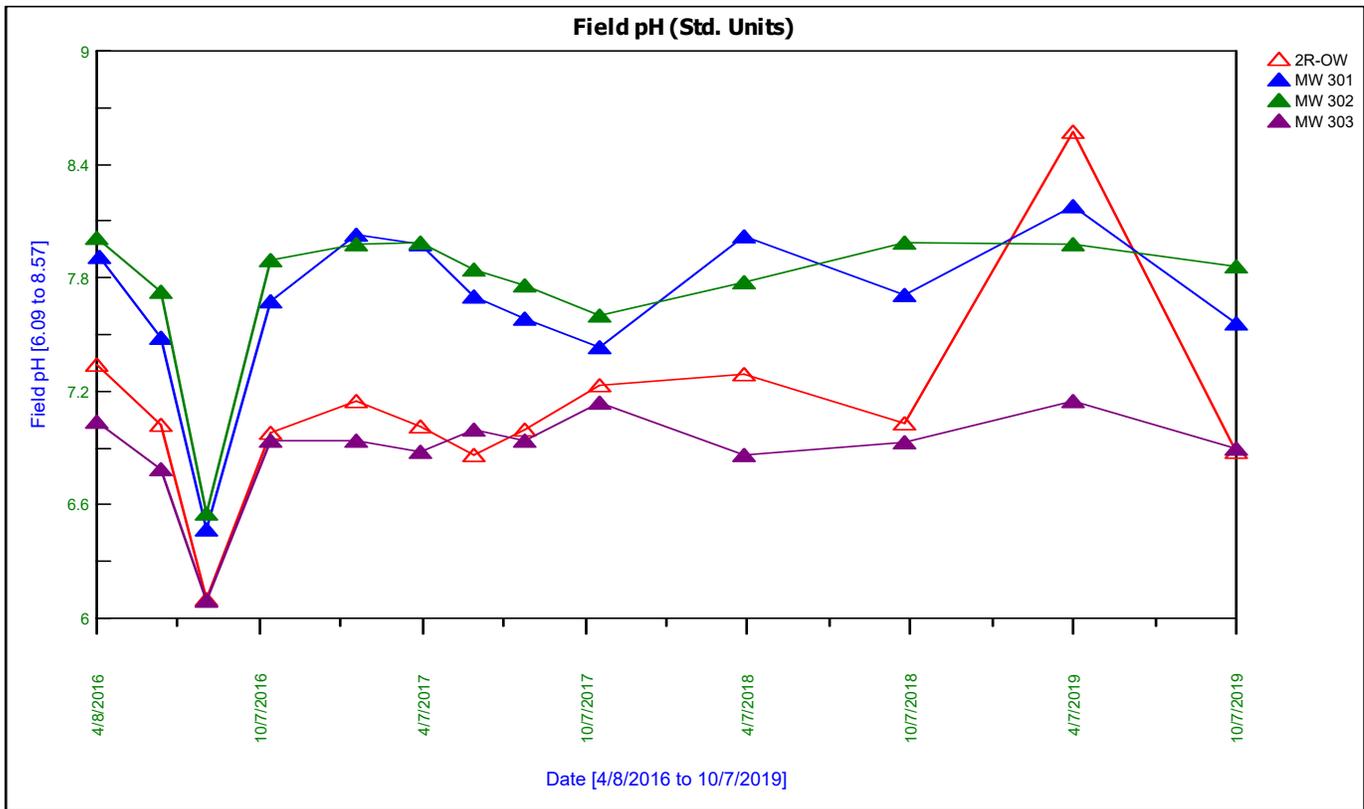
FIGURE  
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Appendix A  
Trend Plots for CCR Wells





F2 April 2020 ASD

# Alternative Source Demonstration April 2020 Detection Monitoring

Edgewater Generating Station  
Sheboygan, Wisconsin

Prepared for:



**SCS ENGINEERS**

25220068.00 | October 12, 2020

2830 Dairy Drive  
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## PE CERTIFICATION

	<p>I, Sherren Clark, hereby certify that that the information in this alternative source demonstration is accurate and meets the requirements of 40 CFR 257.94(e)(2). This certification is based on my review of the groundwater data and related site information available for the Edgewater Generating Station Ash Ponds. I am a duly licensed Professional Engineer under the laws of the State of Wisconsin.</p>
	<p>(signature) _____ (date) _____</p>
	<p>(printed or typed name)</p> <p>License number _____</p> <p>My license renewal date is January 31, 2021.</p> <p>Pages or sheets covered by this seal:</p>
	<p>Alternative Source Demonstration – April 2020 Detection Monitoring, Edgewater Generating Station, Sheboygan Wisconsin (Entire Document)</p>

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## 1.0 INTRODUCTION

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

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

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

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

This ASD report is evaluating the SSIs observed in the statistical evaluation of the April 2020 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, pH, 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 2020 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. EDG has four existing 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)

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 as **Figure 2**. Closure of the CCR impoundments is in progress during 2020.

The closed CCR landfill (Wisconsin Department of Natural Resources [WDNR] Permit No. 2524) is located immediately west of the ponds. 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 (BT2, 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

The statistical evaluation was completed in accordance with 40 CFR 257.93(f)(3) using a prediction interval procedure, in which an interval for each constituent is established from the distribution of the background data, and the level of each constituent in each compliance well is compared to the upper prediction limit (UPL) to evaluate whether a statistically significant increase (SSI) has occurred. The evaluation was based on an interwell comparison. The interwell UPLs were calculated based on a 1-of-2 resampling approach. The UPLs and results for the April 2020 monitoring event and the June 2020 resampling event are summarized in the attached **Table 1**.

The April/June 2020 SSIs included the following parameters and wells:

- Boron: MW-301, MW-302, MW-303
- Fluoride: MW-302
- pH: MW-301, MW-302
- Sulfate: MW-301, MW-302

The SSIs are consistent with SSIs identified in previous detection monitoring results.

The initial April sample results also indicated a potential SSI for fluoride at monitoring well MW-301. Because fluoride was not detected in the background samples used to develop the UPLs, the Double Quantification Rule applies for this parameter, meaning that an SSI is identified if two results (original and retest) exceed the laboratory's LOQ. Based on the reported detection of fluoride above the LOQ and the associated laboratory QC failure for fluoride at MW-301 identified in the April 2020 results, a resample was completed for fluoride at MW-301 on June 26, 2020. The resample result was below the LOQ; therefore, there is no fluoride SSI for MW-301.

### 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, field pH, fluoride, and sulfate results from background and compliance sampling are provided in **Table 2**. The laboratory report for the April 2020 detection monitoring event will be included in the 2020 annual groundwater monitoring and corrective action report submitted in January 2021. 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, 2018b).

## 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 slight 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** is based on groundwater levels measured in the unconsolidated deposits during the April 2020 detection monitoring event. The water table map shows a generally southward flow direction, with localized groundwater mounding in the area of the EDG ponds. The groundwater elevations at the CCR wells during the April 2020 detection monitoring event are in **Table 3**. The groundwater elevations at the state monitoring wells during the April 2020 monitoring event are in **Table 4**.

## 3.0 METHODOLOGY AND ANALYSIS REVIEW

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

### 3.1 SAMPLING AND FIELD ANALYSIS 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 other 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.

The field pH trend plots were also reviewed for any anomalous results that might indicate a possible sampling or field analysis error (e.g., calibration error or incorrect sample identification). The time series plots are provided in **Appendix A**.

The field pH results reported for all wells for the August 2016 background monitoring event were anomalously low, which is most likely due to a calibration error or other problem with the field pH meter for that event. During the statistical evaluation of the background data from well 2R-OW to develop the Upper Prediction Limit (UPL) for field pH, the August 2016 field pH result was identified as an outlier and was not used in the UPL calculation.

Although the compliance wells also had outlier pH results for August 2016, the anomalous results for those wells were not considered when evaluating SSI determinations for the April 2020 detection monitoring, because an interwell analysis was used for the SSI evaluation, comparing current compliance well results to UPLs based on background well results.

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 2020 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 previous detection monitoring events were reviewed as part of the ASD preparation for each event where applicable.

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. For the wells and parameters with SSIs, there were no other laboratory QC 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 2020 boron, pH, fluoride, and sulfate results for 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 2020 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 2020 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, sulfate, field pH, and fluoride 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, sulfate, field pH, and fluoride.

### 4.1 POTENTIAL CAUSES OF SSI

#### 4.1.1 Natural Variation

The statistical analysis was completed using an interwell approach, comparing the April 2020 detection monitoring results to the UPLs calculated based on 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 contributed to the SSIs for pH at MW-301 and MW-302. The UPL was calculated based on pH results at background well 2R-OW for the eight CCR Rule background monitoring events. Based on these results the calculated UPL was 7.47. During the April 2020 sampling event, the reported pH results at MW-301 and MW 302 were 7.82 and 7.56, respectively. The pH exceedance at MW-301 was confirmed during a resampling event in June 2020 where MW-301 pH was 7.53. The April 2019 and October 2019 pH values at 2R-OW, the background well, were 8.57 and 6.88, respectively, indicating considerable natural variability. This suggests that the SSIs for pH may be partially or completely due to natural variation.

Natural variation may also 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 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 were just above the laboratory's LOQ, ranging from 0.78 mg/L in April 2018 to 0.97 mg/L in April 2020. The result at MW-302 is within the range of reported natural concentrations, indicating that the fluoride concentration observed in these wells are likely 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, pH, and sulfate SSIs could include the closed CCR landfill, the coal storage area, or other plant operations. Based on



the groundwater flow directions and on 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 EVIDENCES

The lines of evidence indicating that the SSIs for boron, sulfate, fluoride, and pH 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, sulfate, fluoride, and elevated pH are all 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 and pH 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<sup>2</sup> in 1993, found that groundwater impacts were likely due to the closed landfill (**Figure 2**) located immediately west of the ponds (BT<sup>2</sup>, 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. 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, sulfate, fluoride, and pH, 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 WPDES lagoons (North Pond A and South Pond A) were constructed is 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. Additionally, 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, fluoride, and pH in comparison to the slag composite sample.

- 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. 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 4R-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, sulfate, fluoride, and elevated pH are all present in the CCR landfill leachate. Recent groundwater and leachate monitoring results for boron, sulfate, and pH in samples from the state monitoring program wells are summarized in **Table 5** (April 2016 through April 2020). 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.

**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.

**Field pH:** Field pH results for the three leachate head wells continue to have pH measurements that are slightly higher than the pH UPL calculated from the well 2R-OW background data. Sixteen of the 27 leachate field pH readings for April 2016 through April 2020 were higher than the calculated UPL. While slightly higher pH values were reported for the CCR well samples in April 2020, the range of pH

values for the CCR compliance wells has generally been similar to recent pH results for leachate wells 37-OW and 38R-OW. Historically pH values at leachate head well 39R-OW were in the range of 8 to 9, but pH has followed a gradual decreasing trend at this well since routine monitoring began in 1994.

**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 6**). The fluoride concentration for the sample collected at MW-302 was equal to the highest observed concentration at the leachate wells with a value of 0.97 mg/L.

Based on these results, fly ash disposal in the closed CCR landfill is a likely historical source of elevated boron, sulfate, pH, and 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 5**, 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 and sulfate are in monitoring wells downgradient from the landfill, including 40-OW (recently replaced 18-OW) and 29-OW. Elevated boron and sulfate also continue to be reported for samples from wells 4R-OW and 5-OW, located near the southwest and northwest corners of the landfill.

## **5.0 ALTERNATIVE SOURCE DEMONSTRATION CONCLUSIONS**

The lines of evidence discussed above regarding the SSIs reported for boron, fluoride, field pH, 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. The SSIs for fluoride and field pH at MW-301 and MW 302 may also be partially due to natural variability within the glacial sediment aquifer.

## **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 2020 Annual Report due January 31, 2021

## **7.0 REFERENCES**

BT<sup>2</sup>, Inc., 1993, Field Investigation Report, Edgewater Closed Ash Disposal Facility, Wisconsin Power & Light Company, WDNR License #2524, June 1993.

Kammerer, 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.

Luczaj, J., and Masarik, K, 2015, Groundwater Quantity and Quality Issues in a Water-Rich Region: Examples from Wisconsin, USA: Resources, 2015, 4, 323-357.

RMT, Inc., 1997, Groundwater Assessment Report, Edgewater Closed Ash Disposal Facility, September 30, 1997.

SCS Engineers, 2019, 2018 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station, January 2019.

SCS Engineers, 2018a, 2017 Annual Groundwater Monitoring and Corrective Action Report, Edgewater Generating Station, January 2018.

SCS Engineers, 2018b, Alternative Source Demonstration, October 2017 Monitoring Event, Edgewater Generating Station, April 2018.

SCS Engineers, 2016, Biennial Groundwater Monitoring Report for 2014-2015, Wisconsin Power and Light Company – Edgewater 1-4 (Closed) Ash Disposal Facility, Sheboygan, Wisconsin, License #02524, March 2016.

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

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