

# 2020 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Generating Station – Ash Pond  
Ottumwa, Iowa

Prepared for:

Alliant Energy



**SCS ENGINEERS**

25220072.00 | January 29, 2021

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## Overview of Current Status

### Edgewater Generating Station, Ash Pond 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 coal combustion residual (CCR) unit. 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;	Assessment
<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;	Assessment
<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	SSIs for Appendix III parameters were first identified in 2018. SSIs identified in 2020 are consistent with previous results and are listed below.  <u>March 2020</u> Calcium: MW-305A Fluoride: MW-305A Field pH: MW-305, MW-305A

Category	Rule Requirement	Site Status
		<p><u>April/June 2020</u>            Boron: MW-302, MW-304, MW-305, MW-306            Calcium: MW-302, MW-303, MW-304, MW-305, MW-305A            Chloride: MW-302, MW-304, MW-305, MW-305A            Fluoride: MW-304, MW-305A            Field pH: MW-305, MW-305A</p> <p><u>October 2020</u>            Boron: MW-302, MW-303, MW-304, MW-305, MW-306            Calcium: MW-302, MW-303, MW-304, MW-305, MW-305A, MW-306            Chloride: MW-302, MW-303, MW-304, MW-305, MW-305A            Fluoride: MW-304, MW-305A            Field pH: MW-302, MW-303, MW-304, MW-305, MW-305A            Sulfate: MW-302, MW-304, MW-306            Total Dissolved Solids: MW-302, MW-303, MW-304, MW-305, MW-305A, MW-306</p>
	(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 16, 2018

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:	
	(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;	Cobalt: MW-305, MW-306
	(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;	April 15, 2019
	(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and	June 4, 2020 An additional public meeting will be held in 2021 prior to remedy selection
	(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.	September 12, 2019 - Original ACM  November 25, 2020 – Addendum No. 1 to ACM
<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 Selected (In Progress)
<b>Corrective Action</b>	(vi) Whether remedial activities were initiated or are ongoing pursuant to §257.98 during the current annual reporting period.	Not Initiated

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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. The Ottumwa Generating Station (OGS) site location is shown on **Figure 1**.

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

The groundwater monitoring system is designed to detect monitored constituents at the waste boundary of the OGS Ash Pond (existing CCR surface impoundment), as required by 40 CFR 257.91(d). The groundwater monitoring system currently consists of 1 upgradient monitoring well, 5 downgradient compliance monitoring wells at the waste boundaries, and 5 additional downgradient delineation monitoring wells. A separate groundwater monitoring system evaluates groundwater conditions for the OGS Zero Liquid Discharge Pond CCR unit.

## 2.0 BACKGROUND

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

- Geologic and hydrogeologic setting
- CCR Rule monitoring system

## 2.1 GEOLOGIC AND HYDROGEOLOGIC SETTING

### 2.1.1 Regional Information

The uppermost aquifer unit at the site, as defined under 40 CFR 257.53, is the Mississippian bedrock aquifer and hydraulically connected overlying unconsolidated deposits. Regionally, unconsolidated alluvial aquifers near the Des Moines River and deeper bedrock aquifers are both used for water supply. The thickness and water-producing capacity of the unconsolidated material in the area is variable. A summary of the regional hydrogeologic stratigraphy is included in **Appendix A**.

The bedrock surface elevation is highly variable due to erosion. A map showing regional bedrock surface topography is included in **Appendix A**.

Although not encountered in drilling at the OGS site, the uppermost bedrock unit in the surrounding region consists of Pennsylvanian shales with minor siltstone, sandstone, limestone, and coal intervals. The continuity of these minor beds is highly variable. The Pennsylvanian bedrock unit is considered to be a regional aquitard. The thickness of the Pennsylvanian shale is variable; in some areas of Wapello County it is over 100 feet thick, while in other areas it is absent. The variation in thickness is due to erosion of the bedrock surface. Based on the available boring logs from the OGS site, it appears that the Pennsylvanian shale is absent at the site.



Underlying the Pennsylvanian shales are Mississippian limestone and dolomite, with some shale and sandstone. A map showing the elevation of the top of the Mississippian limestone in Southeastern Iowa is included in **Appendix A**. The Mississippian unit is the shallowest regional bedrock aquifer.

The Devonian units underlying the Mississippian are composed of shale, dolomite, and limestone, and are in turn underlain by Silurian dolomite and Cambrian-Ordovician dolomite and sandstone. The Cambrian-Ordovician aquifer is commonly the source of municipal and industrial high-capacity wells in the region (Coble, 1971).

Groundwater flow within the Mississippian limestone is generally to the east. A map showing the regional potentiometric surface in the Mississippian limestone is included with the hydrogeologic background information presented in **Appendix A**.

## 2.1.2 Site Information

Site boring logs indicate that the unconsolidated material at the site is fairly thin (approximately 20 to 30 feet or less) and consists of a clay layer overlying clay and sand. Monitoring wells MW-301 through MW-306 were installed to intersect the bedrock aquifer or unconsolidated material in contact with the bedrock aquifer at the site. The unconsolidated material at these well locations is generally clay, silt, and sand, and the uppermost bedrock appears to be weathered. The total boring depths were between 14.5 and 52 feet and weathered bedrock was encountered at depths between 7 and 44 feet below ground surface. Boring logs, well construction and development documentation for MW-301 through MW-306 are included in **Appendix B**.

Monitoring wells MW-310 and MW-311 were installed in August 2019 as delineation wells to assess the downgradient extent of groundwater impacts. Both wells were installed along the Des Moines River. Both are water table wells screened in alluvial sands. The total boring depths were 23 feet at MW-310 and 16 feet at MW-311. Boring logs, well construction and development documentation for MW-310 and MW-311 are included in **Appendix B**.

Monitoring wells MW-305A, MW-310A, and MW-311A were installed in February and March 2020 as additional delineation wells to assess the downgradient vertical extent of groundwater impacts. They were installed as nested wells with MW-305, MW-310, and MW-311. All three wells were screened in the Mississippian Dolomite. The bedrock at the MW-305A location was a combination of interbedded sandstone and dolomite. The total boring depths were 80 feet at MW-305A, 54 feet at MW-310A, and 46 feet at MW-311A. Boring logs, well construction, and development documentation for MW-305A, MW-310A, and MW-311A are included in **Appendix B**.

The Mississippian bedrock aquifer, including some overlying weathered bedrock and sand, is confined below the clay layer. To evaluate groundwater flow directions and rates, potentiometric surface maps were developed for two depth intervals within the confined aquifer. The shallow potentiometric surface is based on monitoring wells installed near the top of the aquifer. The deep potentiometric surface is based on the deeper "A" wells.

The shallow and deep potentiometric surfaces and groundwater flow patterns based on April 2020 water level measurements are shown on **Figures 3** and **4**. The shallow and deep potentiometric surfaces and groundwater flow patterns for the October 2020 water level measurements are shown on **Figures 5** and **6**. All four potentiometric surface maps show groundwater flow moving to the east, following the same flow patterns observed in regional flow maps of the area. The groundwater elevation data for the CCR monitoring wells are provided in **Table 3**. Estimated horizontal gradients

and flow velocities for flow at the shallow and deep levels within the aquifer are provided in **Table 4A**. Calculated vertical gradients for the nested wells are provided in **Table 4B**.

## 2.2 CCR RULE MONITORING SYSTEM

The groundwater monitoring system established in accordance with the CCR Rule consists of one upgradient (background) monitoring well and five downgradient monitoring for the OGS Ash Pond (**Table 1** and **Figure 2**). The background well is MW-301 and the five downgradient compliance wells include MW-302, MW-303, MW-304, MW-305, and MW-306. Five additional wells, MW-305A, MW310/310A, and MW311/311A were added as delineation wells following initiation of assessment monitoring and confirmation that cobalt concentrations in MW-305 and MW-306 exceeded the Groundwater Protection Standard. The CCR Rule wells are installed in the Mississippian aquifer and/or hydraulically connected overlying unconsolidated deposits, which comprise the uppermost aquifer unit at the site. Well depths range from approximately 14 to 80 feet.

The background well (MW-301) is located to the west of the site. The downgradient wells (MW-302 through MW-306) are located along the northeastern, eastern, and southeastern edges of the Ash Pond. The downgradient wells were installed as close as practicable to the pond boundaries considering the site layout.

## 3.0 § 257.90(E) ANNUAL REPORT REQUIREMENTS

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

### 3.1 §257.90(E)(1) SITE MAP

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

A map of the site location is provided on **Figure 1**. A map with an aerial image showing the CCR unit and all background (or upgradient) and downgradient monitoring wells with identification numbers for the groundwater monitoring program is provided as **Figure 2**. The OGS Zero Liquid Discharge Pond CCR unit, which is monitored by a separate network and is discussed in a separate groundwater monitoring report, is also shown on **Figure 2**.

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

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

Three new monitoring wells, MW-305A, MW-310A and MW-311A, were installed between February 25 and March 4, 2020, to characterize site conditions in accordance with § 257.95(g)(1). The monitoring well logs and well construction forms were completed for the operating record on September 16, 2020, and are included in **Appendix B**.

## 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;*

Five groundwater sampling events were completed in 2020. 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 assessment monitoring programs is included in **Table 2**.

The two semiannual assessment monitoring rounds for the complete monitoring network were completed in April and October 2020. In addition to Appendix III and Appendix IV parameters, both semiannual events included parameters chosen to support the selection of remedy. Supplemental parameters included dissolved and total metals, general water quality parameters, and parameters used to evaluate feasibility of monitored natural attenuation (MNA).

Supplemental monitoring events performed in February, March, and June 2020 were limited to a subset of the wells and/or parameters as described below.

In February 2020, downgradient delineation wells MW-310 and MW-311, and upgradient well MW-301 were sampled for Appendix III and Appendix IV parameters. This was the second round of samples from the delineation wells installed in 2019

In March 2020, the new downgradient piezometers (MW-305A, MW-310A and MW-311A) ) were sampled for Appendix III and Appendix IV parameters. This was the first round of samples from these three wells. In addition, selected wells were sampled for dissolved and total metals to support the selection of remedy, including evaluation of the feasibility of MNA. Samples were also analyzed for total and dissolved lithium to support the evaluation of potential sources of lithium detected at concentrations exceeding the GPS in the initial samples from delineation well MW-310.

. In June 2020, monitoring well MW-311A was resampled for fluoride in response to the detection of fluoride above the GPS in one of two previous samples at this well. The supplemental fluoride result was collected to support evaluation of whether fluoride is at a statistically significant level above the GPS at MW-311A, as described in Section 3.4..

The 2020 monitoring results are summarized in **Table 5**. 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 was no monitoring program transition in 2020.

Assessment monitoring for the OGS Ash Pond was initiated in April 2018 and continued through 2020. An Assessment of Corrective Measures (ACM) was initiated for the OGS Ash Pond in April 2019 and completed in September 2019. Addendum No. 1 to the ACM was completed in November 2020. The selection of remedy is in progress. The ACM was initiated in response to the detection of cobalt at a statistically significant level exceeding the Groundwater Protection Standards (GPS) in monitoring wells MW-305 and MW-306. Assessment monitoring continued during the ACM and will continue during the selection of remedy and implementation of the corrective action program.

In accordance with the Unified Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities (USEPA, 2009), the comparison of assessment monitoring results to the Groundwater Protection Standard (GPS) was based on the lower confidence limit (LCL) for the arithmetic mean. The LCL evaluation was completed for the Appendix IV parameters that have been detected at a concentration exceeding the GPS in at least one sample result since assessment monitoring was initiated, which include cobalt, fluoride and lithium. The LCLs were calculated with Sanitas™ groundwater statistical software using historical concentrations measured since assessment monitoring began in April 2018. The most recent LCL evaluation, completed for the October 2020 event, is provided in **Appendix E**.

The only parameter determined to be at a statistically significant level above the GPS continued to be cobalt at MW-305. For fluoride at MW-311A and lithium at MW-310, the LCL was below the GPS. For lithium at MW-310A, only three samples have been collected to date, so the LCL cannot yet be calculated.

A trend analysis evaluation was completed for cobalt. Trend analyses were calculated with Sanitas™ using historical concentrations measured since assessment monitoring began for each well. The evaluation is provided in **Appendix E**. Based on the trend analysis, there are no statistically significant trends in cobalt concentrations at the monitoring wells.

Additional evaluation of the source and significance of the fluoride and lithium detections above the GPS at delineation wells will be completed as part of the ongoing selection of remedy process. Because these parameters were not detected above the GPS in the compliance wells adjacent to the ash pond, it appears unlikely that the ash pond CCR unit is the source.

### 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.

### 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 is currently in the selection of remedy process, with assessment monitoring continuing.

#### **Summary of Key Actions Completed.**

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the October 2019 monitoring event (January 2020).
- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2020 monitoring event (July 2020).
- Continued work on the selection of remedy in accordance with § 257.97.
- Installation of three additional monitoring wells to characterize site conditions for the selection of remedy (March 2020).
- Semiannual progress reports for the Selection of Remedy process (March and September 2020). The September progress report was initially described as a final report. The report was recharacterized as a progress report in response to EPA comments on the ACM and ongoing work related to the selection of remedy.
- Completion of Addendum Number 1 to the ACM (November 2020).
- Two semiannual assessment monitoring events (April and October 2020).
- Supplemental monitoring events in February, March, and June 2020 to characterize groundwater quality at selected wells installed to delineate the nature and extent of impacts.

#### **Description of Any Problems Encountered.**

- There were no problems encountered during 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 statistically significant levels exceeding the GPS for the October 2020 monitoring event (January 2021).

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2021 monitoring event (July 2021).
- Continued work on the selection of remedy in accordance with § 257.97.
- Semiannual progress reports for the Selection of Remedy process.
- Two semiannual assessment monitoring 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. OGS is no longer in detection monitoring program.

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

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

Not applicable. OGS is no longer in detection monitoring program.

### **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 been initiated at the site, but no alternative assessment monitoring frequency is proposed at this time.

### **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).*

The 2020 assessment monitoring results, background upper prediction limits (UPLs), and GPSs established for the Ash Pond are provided in **Table 5**. The laboratory reports are provided in **Appendix C**. Historical monitoring results are summarized in **Appendix D**.

Supplemental groundwater quality parameters were included in the monitoring program in 2020 to support the selection of remedy process, including the evaluation of monitored natural attenuation (MNA). The results for the supplemental parameters are included in **Table 5** and in the laboratory reports in **Appendix C**.

### **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. No alternative source demonstration evaluation for assessment monitoring was completed in 2020.

### **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.*

The ACM was initiated on April 15, 2019. The certification demonstrating the need for a 90-day deadline extension was completed on July 10, 2019, and was included in the 2019 annual groundwater monitoring and corrective action report. The ACM was completed on September 12, 2019. Addendum No. 1 to the ACM was completed on November 25, 2020.

## **3.6 §257.90(E)(6) OVERVIEW**

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

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

## **4.0 REFERENCES**

Coble, R.W., 1971, The Water Resources of Southeast Iowa, Iowa Geological Survey Water Atlas Number 4, 1971.

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

## Tables

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**Table 1. Groundwater Monitoring Well Network  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25220072.00**

<b>Monitoring Well</b>	<b>Location in Monitoring Network</b>	<b>Role in Monitoring Network</b>
MW-301	Upgradient	Background
MW-302	Downgradient	Compliance
MW-303	Downgradient	Compliance
MW-304	Downgradient	Compliance
MW-305	Downgradient	Compliance
MW-305A	Downgradient, deeper	Delineation
MW-306	Downgradient	Compliance
MW-310	Downgradient	Delineation
MW-310A	Downgradient, deeper	Delineation
MW-311	Downgradient	Delineation
MW-311A	Downgradient, deeper	Delineation

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

Date: 12/14/2020  
 Date: 1/12/2021  
 Date: 1/19/2021

**Table 2. CCR Rule Groundwater Samples Summary  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25220072.00**

Sample Dates	Compliance Wells				Delineation Well	Compliance Well	Delineation Wells				Background Well
	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW311A	MW-301
2/5/2020	--	--	--	--	--	--	A	--	A	--	A
3/12-13/2020	--	--	--	A	A	--	A	A	A	A	A
4/13-14/2020	A	A	A	A	A	A	A	A	A	A	A
6/30/2020	--	--	--	--	--	--	--	--	--	A	--
10/8-12/2020	A	A	A	A	A	A	A	A	A	A	A
Total Samples	2	2	2	3	3	2	4	3	4	4	4

Abbreviations:

A = Assessment Monitoring Program

-- = Not sampled

Created by: NDK Date: 1/4/2019  
 Last revision by: RM Date: 1/19/2021  
 Checked by: NDK Date: 1/19/2021

**Table 3. Groundwater Elevation Summary**  
**IPL - Ottumwa Generating Station / SCS Engineers Project #25220072.00**

Ground Water or Surface Water Elevation in feet above mean sea level (amsl)																
Well Number	MW-301	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-307	MW-308	MW-309	MW-310	MW-310A	MW-311	MW-311A	River at Intake	Chillicothe Bridge
Top of Well Casing Elevation / Surface Water Reference Elevation (feet amsl)	686.63	673.90	661.07	682.84	683.91	684.03	683.47	657.56	655.39	654.94	658.63	657.93	654.18	653.54	656.31	667.98
Screen Length (ft)	10.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	NA	NA
Total Depth (ft from top of casing)	17.0	25.8	17.5	52.3	51.5	81.91	36.6	28.0	25.0	27.5	25.9	55.55	17.9	47.68	NA	NA
Top of Well Screen Elevation (ft)	679.63	653.10	648.57	635.54	637.41	607.12	651.87	634.56	635.39	632.44	637.76	607.38	641.24	610.86	NA	NA
Measurement Date																
April 26, 2016	682.80	655.63	652.42	655.37	661.67	NI	670.86	NI	NI	NI	NI	NI	NI	NI	NI	NI
June 23, 2016	682.58	655.65	652.89	656.53	662.36	NI	670.64	NI	NI	NI	NI	NI	NI	NI	NI	NI
August 9, 2016	682.27	655.52	651.76	653.79	660.78	NI	670.35	NI	NI	NI	NI	NI	NI	NI	NI	NI
October 26-27, 2016	682.04	655.67	652.17	655.03	661.37	NI	670.21	NI	NI	NI	NI	NI	NI	NI	NI	NI
January 18-19, 2017	681.67	655.46	651.74	654.50	660.87	NI	669.89	648.81	647.42	646.66	NI	NI	NI	NI	NI	NI
April 19-20, 2017	682.15	656.35	654.57	657.48	663.27	NI	670.69	653.62	651.09	650.16	NI	NI	NI	NI	NI	NI
June 20-21, 2017	681.91	655.65	652.42	654.75	661.26	NI	669.94	649.85	648.26	647.60	NI	NI	NI	NI	NI	NI
August 21-23, 2017	681.28	655.13	650.58	652.39	659.00	NI	668.77	645.78	643.12	641.82	NI	NI	NI	NI	NI	NI
November 8, 2017	681.54	655.40	651.34	653.03	659.76	NI	669.04	647.37	644.99	644.20	NI	NI	NI	NI	NI	NI
April 18, 2018	681.53	655.71	652.47	655.55	660.99	NI	668.92	649.66	647.91	647.65	NI	NI	NI	NI	NI	NI
May 30, 2018	NM	NM	NM	NM	NM	NI	NM	652.45	651.05	650.98	NI	NI	NI	NI	NI	NI
June 28, 2018	NM	NM	NM	NM	NM	NI	NM	652.87	651.43	651.47	NI	NI	NI	NI	NI	NI
July 18, 2018	NM	NM	NM	NM	NM	NI	NM	652.27	650.67	650.69	NI	NI	NI	NI	NI	NI
August 14-15, 2018	680.91	656.05	652.57	656.35	661.56	NI	668.66	NM	NM	NM	NI	NI	NI	NI	NI	NI
August 29, 2018	681.09	655.89	655.07	657.82	NM	NI	NM	NM	NM	NM	NI	NI	NI	NI	NI	NI
October 16, 2018	682.50	656.91	656.17	658.20	663.37	NI	670.24	654.13	NM	651.61	NI	NI	NI	NI	NI	NI
January 8, 2019	682.22	656.03	654.65	656.28	662.13	NI	669.84	NM	NM	NM	NI	NI	NI	NI	NI	NI
April 8, 2019	682.69	657.23	655.55	659.33	664.01	NI	670.96	654.90	653.70	653.55	NI	NI	NI	NI	NI	NI
August 28, 2019	NM	NM	NM	NM	NM	NI	NM	NM	NM	NM	640.98	NI	642.10	NI	NI	NI
October 23-24, 2019	683.07	660.14	653.86	657.71	663.21	NI	671.28	651.89	651.31	651.28	649.31	NI	647.80	NI	NI	NI
December 11, 2019	NM	NM	NM	NM	NM	NI	NM	649.59	647.39	647.24	NM	NI	NM	NI	NI	NI
February 5, 2020	683.30	NM	NM	NM	NM	NI	NM	649.88	650.12	648.34	644.71	NI	645.00	NI	NI	NI
March 12-13, 2020	682.82	NM	NM	NM	661.41	651.64	NM	NM	NM	NM	645.45	617.84	644.18	624.11	NI	NI
April 1, 2020	683.27	657.00	655.89	658.57	660.59	655.05	671.13	653.76	651.88	651.23	651.09	649.16	649.35	648.27	649.71	NI
April 13-14, 2020	683.25	656.45	654.08	656.42	662.44	653.69	670.71	650.66	650.09	649.19	645.91	647.50	646.79	648.42	645.71	NI
May 4, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	642.2
June 30, 2020	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	647.73	NM	
October 5-12, 2020	682.34	655.80	650.37	652.95	659.81	648.01	670.18	646.18	642.85	641.50	638.46	640.20	638.73	641.09	NM	
Bottom of Well Elevation (ft)	669.63	648.10	643.57	630.54	632.41	602.12	646.87	629.56	630.39	627.44	632.76	602.38	636.24	605.86	--	

Notes:  
 NM = not measured  
 NI = not installed

Created by: KAK  
 Last rev. by: RM  
 Checked by: NDK  
 Proj Mgr QA/QC: TK

Date: 5/1/2017  
 Date: 1/12/2021  
 Date: 1/19/2021  
 Date: 1/19/2021

**Table 4A. Horizontal Gradients and Flow Velocity  
Ottumwa Generating Station - Ash Pond /  
SCS Engineers Project #25220072.00  
January - December 2020**

Shallow					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
4/13-14/2020	670.71	655.00	396	0.04	0.24
4/13-14/2020	656.42	645.91	1004	0.01	
4/13-14/2020	660.00	650.00	1919	0.01	
10/5-12/2020	670.18	640.00	851	0.04	0.24
10/5-12/2020	652.95	638.46	1015	0.01	
10/5-12/2020	655.80	640.00	2253	0.01	

Deep					
Sampling Dates	h1 (ft)	h2 (ft)	Δl (ft)	Δh/Δl (ft/ft)	V (ft/d)
4/13-14/2020	653.00	648.00	478	0.01	0.0001
10/5-12/2020	648.00	641.00	537	0.01	0.0002

Well	K Values (cm/sec)	K Values (ft/d)
MW-301	4.6E-03	13
MW-302	3.2E-03	9.1
MW-303	1.2E-04	0.35
MW-304	3.5E-04	0.98
MW-305	2.5E-03	7.1
MW-305A	5.6E-06	0.02
MW-306	2.8E-03	8.1
MW-310	2.9E-03	8.2
MW-310A	4.2E-07	0.001
MW-311	2.3E-02	64
MW-311A	5.4E-07	0.002
Geometric Mean	1.8E-03	5.1

<b>Assumed Unconsolidated Porosity, n</b>
0.40

<b>Assumed Dolomite Porosity, n</b>
0.25

Note: Geometric mean calculation does not include upgradient or delineation wells (MW-301, MW-305A, MW-310A, or MW-311A).

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  
Δl = distance between location 1 and 2  
Δh/Δl = hydraulic gradient

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

Date: 12/29/2020  
Date: 1/19/2021  
Date: 1/20/2021

**Table 4B. Vertical Gradients**  
**IPL - Ottumwa Generating Station / SCS Engineers Project #25220072.00**  
**2020**

Vertical Hydraulic Gradients	MW-305/MW-305A		MW-310/MW-310A		MW-311/MW-311A	
	Shallow Well Screen midpoint (feet amsl)	MW-305 634.91		MW-310 635.26		MW-311 638.74
Deep Well Screen midpoint (feet amsl)	MW-305A 604.62		MW-310A 604.88		MW-311A 608.36	
Measurement Date	Distance between midpoints (ft)	Vertical Gradient (ft/ft)	Distance between midpoints (ft)	Vertical Gradient (ft/ft)	Distance between midpoints <sup>(2)</sup> (ft)	Vertical Gradient (ft/ft)
April 1, 2020	30.3	-0.183	30.4	-0.064	30.4	-0.036
April 13-14, 2020	30.3	-0.289	30.4	0.052	30.4	0.054
October 5-12, 2020	30.3	-0.390	30.4	0.057	29.1	0.081

Notes:

- 1: A positive vertical gradient indicates upward groundwater flow. A negative gradient indicates downward flow.
- 2: The well screen at MW-311 was not fully submerged during the October 2020 sampling event. In this case, the effective screen midpoint for MW-311 is calculated at the midpoint between the water table elevation and screen bottom elevation.

NM: Not Measured

NI: Not Installed

Last rev. by: RM  
 Checked by: MDB  
 Proj Mgr QA/QC: TK

Date: 1/19/2021  
 Date: 1/19/2021  
 Date: 1/20/2021

Table 5. Groundwater Analytical Results Summary - 2020  
Ottumwa Generating Station Ash Pond / SCS Engineers Project #25220072.00

Parameter Name	UPL Method	UPL	GPS	Background Well				Compliance Wells									Delineation Well			Compliance Well	
				MW-301				MW-302		MW-303		MW-304		MW-305			MW-305A			MW-306	
				2/5/2020	3/12/2020	4/14/2020	10/8/2020	4/14/2020	10/8/2020	4/14/2020	10/8/2020	4/13/2020	10/8/2020	3/13/2020	4/13/2020	10/8/2020	3/13/2020	4/14/2020	10/8/2020	4/14/2020	10/8/2020
<b>Appendix III</b>																					
Boron, ug/L	P	820		540	--	700	650 F1	1,200	1300	420	1100	1,000	1000	--	920	900	250	280	180	1,000	1100
Calcium, mg/L	P	78.7		68	--	84	94	180	180	170	210	130	120	--	100	110	100	130	150	73	80
Chloride, mg/L	P	86.8		120	--	140	170	220	230	47	210	250	250	--	270	290	40	89	120	41	43
Fluoride, mg/L	P	0.484		--	--	<0.23	<0.23	<0.23	<0.23 ^	<0.23	0.26 J^	1.1	1.1	--	0.35 J	0.38 J^	0.77	0.73	0.73	<0.23	<0.23 ^
Field pH, Std. Units	P	6.87		6.39	6.48	6.58	6.22	6.7	7.00	6.98	8.28	7.12	7.88	7.02	7.0	7.44	8.09	7.63	7.46	6.68	6.54
Sulfate, mg/L	P	199		130	--	140	140	790	840	180	190	220	230	--	63	93	40	93	130	310	360
Total Dissolved Solids, mg/L	P	628		570	--	550	660	1,500	1700	810	1100	1,000	1200	--	960	1100	400	570	660	820	900
<b>Appendix IV</b>																					
Antimony, ug/L	P*	0.22	6	--	--	<0.58	<0.51	<0.58	<0.51	<0.58	<0.51	<0.58	<0.51	--	<0.58	<0.51	1.3	0.88 J	<0.51	<0.58	<0.51
Arsenic, ug/L	P*	0.53	10	<0.88	--	<0.88	<0.88	<0.88	<0.88	<0.88	0.96 J	<0.88	--	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88	<0.88
Barium, ug/L	P	68.8	2,000	43	--	54	58	23	18	64	94	80	74	--	110	120	70	80	75	48	49
Beryllium, ug/L	DQ	DQ	4	--	--	<0.27	--	<0.27	--	<0.27	--	<0.27	--	--	<0.27	--	<0.27	<0.27	--	<0.27	--
Cadmium, ug/L	NP*	0.12	5	<0.039	--	<0.039	0.0075 J	0.23	0.2	0.18	0.46	<0.039	<0.049	--	0.14	0.097 J	<0.039	<0.039	<0.049	0.83	0.92
Chromium, ug/L	P	1.07	100	<1.1	--	<1.1	<1.1	1.4 J	<1.1	<1.1	<1.1	3.5 J	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
Cobalt, ug/L	NP	4.1	6	1.1	0.43 J	0.52	0.41 J	5.3	1.5	0.87	2.4	0.57	0.41 J	18	16	17	2.4	2.7	1.5	5.5	5.9
Fluoride, mg/L	P	0.48	4	--	--	<0.23	<0.23	<0.23	<0.23 ^	<0.23	0.26 J^	1.1	1.1	--	0.35 J	0.38 J^	0.77	0.73	0.73	<0.23	<0.23 ^
Lead, ug/L	NP*	0.10	15	<0.27	--	<0.27	<0.11	1.0	<0.11	<0.27	<0.11	0.5	<0.11	--	0.27 J	<0.11	0.68	<0.27	<0.11	0.37 J	<0.11
Lithium, ug/L	P	34.2	40	17	21	24	23	11	9.6 J	4.7 J	5.6 J	4.8 J	3.1 J	2.3 J	3.2 J	<2.5	14	16	13	<2.3	<2.5
Mercury, ug/L	DQ	DQ	2	--	--	<0.10	--	<0.10	--	<0.10	--	<0.10	--	--	<0.10	--	<0.10	<0.10	--	<0.10	--
Molybdenum, ug/L	P	1.74	100	--	--	1.2 J	<1.1	<1.1	<1.1	3.6	<1.1	2	1.5 J	--	6.9	7.9	9	17	6.4	4.4	5.6
Selenium, ug/L	P	8.55	50	--	--	6.8	7.7	<1.0	<1.0	5.0	<1.0	<1.0	<1.0	--	<1.0	<1.0	2.3 J	1.7 J	<1.0	<1.0	<1.0
Thallium, ug/L	NP*	0.14	2	--	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	0.35 J	0.35 J	<0.26	<0.26	<0.26	<0.26	<0.26
Radium 226/228 Combined, pCi/L	P	2.15	5	0.228	--	0.315	0.407	1.26	0.447	0.229	0.654	2.46	2.41	--	0.909	0.483	1.97	1.26	2.05	0.0738	0.889
<b>Additional Parameters - Selection of Remedy</b>																					
Cobalt - dissolved, #	UPL or GPS not applicable			--	0.32 J	0.44 J	--	0.81	--	0.37 J	--	0.37 J	--	16	16	17	2.1	2.8	--	5.4	5.1
Lithium - dissolved, #	UPL or GPS not applicable			--	22	--	--	--	--	--	--	--	--	<2.3	--	--	15	--	--	--	--
Iron, dissolved, # ug/L	UPL or GPS not applicable			--	<50	<50	<50	<50	<50	<50	<50	4,600	4,200	51 J	66 J	63 J	<50	<50	<50	140	100
Iron, ug/L	UPL or GPS not applicable			--	<50	50 J	<50	500	100	280	310	5,200	4,200	390	330	200	720	64 J	64 J	590	340
Magnesium	UPL or GPS not applicable			--	--	33,000	38,000	50,000	57,000	23,000	31,000	43,000	40,000	--	47,000	48,000	--	28,000	31,000	26,000	23,000
Manganese, dissolved, # ug/L	UPL or GPS not applicable			--	17	16	13	110	130	220	1,600	3,700	3,800	3,100	3,400	3,600	150	240	160	16,000	15,000
Manganese, ug/L	UPL or GPS not applicable			--	16	19	14	200	140	260	1,600	3,700	3,800	3,200	3,300	3,600	180	260	150	16,000	16,000
Potassium, ug/L	UPL or GPS not applicable			--	--	1,500	1,500	1,500	1,900	960	1,100	7,700	7,800	--	7,600	8,300	--	3,800	4,200	3,700	3,800
Sodium, ug/L	UPL or GPS not applicable			--	--	77,000	87,000	250,000	280,000	100,000	150,000	210,000	210,000	--	210,000	210,000	--	46,000	64,000	160,000	170,000
Total Alkalinity, mg/L	UPL or GPS not applicable			--	--	150	160	61	72	440	470	370	380	--	460	300	--	270	340	280	160
Carbonate Alkalinity, mg/L	UPL or GPS not applicable			--	--	<1.9	<3.8	<1.9	<1.9	<1.9	<3.8	<1.9	<3.8	--	<1.9	<3.8	--	<1.9	<3.8	<1.9	<3.8
Bicarbonate Alkalinity, mg/L	UPL or GPS not applicable			--	--	150	160	61	72	440	470	370	380	--	460	300	--	270	340	280	160

4.4
30.8
17

Blue highlighted cell indicates the compliance well Blue highlighted cell indicates the c  
Yellow highlighted cell indicates the compliance w Yellow highlighted cell indicates th  
Grayscale indicates Additional Parameters sampled Grayscale indicates Additional Par

Table 5. Groundwater Analytical Results Summary - 2020  
Ottumwa Generating Station Ash Pond / SCS Engineers Project #25220072.00

Parameter Name	UPL Method	UPL	GPS	Background Well				Delineation Wells																	
				MW-301				MW-310				MW-310A			MW-311				MW-311A						
				2/5/2020	3/12/2020	4/14/2020	10/8/2020	2/5/2020	3/13/2020	4/13/2020	10/8/2020	3/13/2020	4/14/2020	10/8/2020	2/5/2020	3/13/2020	4/13/2020	10/8/2020	3/13/2020	4/13/2020	6/30/2020	10/8/2020			
<b>Appendix III</b>																									
Boron, ug/L	P	820		540	--	700	650 F1	620	--	550	800	1500	1,600	1700	<100	--	<100	<80	1400	1,500	NA	1600			
Calcium, mg/L	P	78.7		68	--	84	94	160	--	200	180	82	87	94	130	--	170	160	44	48	NA	51			
Chloride, mg/L	P	86.8		120	--	140	170	120	--	130	150	140	130	130	14	--	13	14	130	140	NA	150			
Fluoride, mg/L	P	0.484		--	--	<0.23	<0.23	0.85	--	1.1	1	1.7	1.8	2	<0.23	--	<0.23	<0.23 ^	3.4	4.1	3.7	4.4			
Field pH, Std. Units	P	6.87		6.39	6.48	6.58	6.22	7.08	6.89	7	7.07	7.73	7.85	7.48	6.72	7.11	6.86	6.93	7.85	8.4	7.64	8.33			
Sulfate, mg/L	P	199		130	--	140	140	530	--	590	570	1200	1,100	1100	54	--	54	70	1200	1,200	NA	1200			
Total Dissolved Solids, mg/L	P	628		570	--	550	660	1200	--	1,300	1200	2300	2,300	2200	520	--	570	640	2300	2,400	NA	2400			
<b>Appendix IV</b>																									
Antimony, ug/L	P*	0.22	6	--	--	<0.58	<0.51	<0.58	--	<0.58	0.61 J	<0.58	<0.58	<0.51	<0.58	--	<0.58	<0.51	<0.58	<0.58	NA	<0.51			
Arsenic, ug/L	P*	0.53	10	<0.88	--	<0.88	<0.88	<0.88	--	<0.88	0.94 J	<0.88	<0.88	<0.88	<0.88	--	<0.88	1.7 J	<0.88	<0.88	NA	<0.88			
Barium, ug/L	P	68.8	2,000	43	--	54	58	53	--	62	55	16	16	16	160	--	180	220	20	20	NA	15			
Beryllium, ug/L	DQ	DQ	4	--	--	<0.27	--	<0.27	--	<0.27	--	<0.27	<0.27	--	<0.27	--	<0.27	--	<0.27	<0.27	NA	--			
Cadmium, ug/L	NP*	0.12	5	<0.039	--	<0.039	0.0075 J	0.12	--	0.16	0.29	<0.039	<0.039	<0.049	<0.039	--	<0.039	0.12	<0.039	<0.039	NA	<0.049			
Chromium, ug/L	P	1.07	100	<1.1	--	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	<1.1	<1.1	--	<1.1	<1.1	<1.1	<1.1	NA	<1.1			
Cobalt, ug/L	NP	4.1	6	1.1	0.43 J	0.52	0.41 J	0.32 J	0.32 J	0.24 J	0.38 J	0.63	0.39 J	0.43 J	0.11 J	<0.091	<0.091	2.2	0.19 J	0.13 J	NA	0.12 J			
Fluoride, mg/L	P	0.48	4	--	--	<0.23	<0.23	0.85	--	1.1	1	1.7	1.8	2	<0.23	--	<0.23	<0.23 ^	3.4	4.1	3.7	4.4			
Lead, ug/L	NP*	0.10	15	<0.27	--	<0.27	<0.11	<0.27	--	<0.27	<0.11	<0.27	<0.27	<0.11	<0.27	--	<0.27	1.8	<0.27	<0.27	NA	<0.11			
Lithium, ug/L	P	34.2	40	17	21	24	23	42	46	48	42	250	290	240	2.9 J	4.7 J	6.2 J	4.6 J	260	310	NA	240			
Mercury, ug/L	DQ	DQ	2	--	--	<0.10	--	<0.10	--	<0.10	--	<0.10	<0.10	--	<0.10	--	<0.10	--	<0.10	<0.10	NA	--			
Molybdenum, ug/L	P	1.74	100	--	--	1.2 J	<1.1	29	--	31	39	2.6	2.7	3	<1.1	--	<1.1	<1.1	1.2 J	2.8	NA	3.1			
Selenium, ug/L	P	8.55	50	--	--	6.8	7.7	3.3 J	--	4.5 J	2.4 J	<1.0	<1.0	<1.0	1.2 J	--	<1.0	<1.0	<1.0	<1.0	NA	<1.0			
Thallium, ug/L	NP*	0.14	2	--	--	<0.26	<0.26	<0.26	--	<0.26	<0.26	<0.26	<0.26	<0.26	<0.26	--	<0.26	<0.26	<0.26	<0.26	NA	<0.26			
Radium 226/228 Combined, pCi/L	P	2.15	5	0.228	--	0.315	0.407	0.0344	--	0.271	0.429	3.43	3.9	4.46	0.108	--	0.17	0.738	1.47	2.31	NA	3.10			
<b>Additional Parameters - Selection of Remedy</b>																									
Cobalt - dissolved, #	UPL or GPS not applicable			--	0.32 J	0.44 J	--	--	0.31 J	0.23 J	--	0.67	0.40 J	--	--	0.11 J	<0.091	--	0.36 J	0.12 J	--	--			
Lithium - dissolved, #				--	22	--	--	--	45	--	44	250	--	230	--	8.0 J	--	--	250	--	--	230	--	230	
Iron, dissolved, # ug/L				--	<50	<50	<50	--	<50	<50	<50	<50	220	<50	--	<50	<50	<50	<50	<50	<50	<50	--	<50	
Iron, ug/L				--	<50	50 J	<50	--	<50	<50	99 J	230	280	--	<50	<50	630	<50	<50	630	<50	<50	--	<50	
Magnesium				--	--	33,000	38,000	--	86,000	76,000	--	41,000	45,000	--	--	40,000	40,000	--	40,000	40,000	--	23,000	--	25,000 J	
Manganese, dissolved, # ug/L				--	17	16	13	--	250	280	350	53	39	29	--	21	39	75	20	22	--	5.8 J	--	5.8 J	
Manganese, ug/L				--	16	19	14	--	260	280	390	51	38	31	--	20	41	180	20	13	--	8.3	--	8.3	
Potassium, ug/L				--	--	1,500	1,500	--	--	12,000	12,000	--	9,900	11,000	--	--	620	810	--	9,000	--	10,000	--	10,000	
Sodium, ug/L				--	--	77,000	87,000	--	--	100,000	100,000	--	630,000	620,000	--	--	5,000	5,100	--	710,000	--	700,000	--	700,000	
Total Alkalinity, mg/L				--	--	150	160	--	--	190	410	--	320	260	--	--	460	290	--	360	--	400	--	400	
Carbonate Alkalinity, mg/L				--	--	<1.9	<3.8	--	--	<1.9	<3.8	--	<1.9	<3.8	--	--	<1.9	<3.8	--	<1.9	<3.8	--	<1.9	--	<3.8
Bicarbonate Alkalinity, mg/L				--	--	150	160	--	--	190	410	--	320	260	--	--	460	290	--	360	--	400	--	400	

4.4
30.8
17

Blue highlighted cell indicates the compliance well result exceeds the UPL (background) and the LOQ.  
Yellow highlighted cell indicates the compliance well result exceeds the GPS.  
Grayscale indicates Additional Parameters sampled for selection of remedy and evaluation of MNA.

**Table 5. Groundwater Analytical Results Summary - 2020  
Ottumwa Generating Station Ash Pond / SCS Engineers Project #25220072.00**

**Abbreviations:**

-- = Not Analyzed

mg/L = milligrams per liter

ug/L = micrograms per liter

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

B = Analyte was detected in the associated Method Blank.

F1 = MS and/or MSD Recovery is outside acceptance limits.

# = Dissolved parameter samples collected for MNA data review

\* = UPL is below the LOQ for background sampling. For compliance wells, only results confirmed above the LOQ are evaluated as potential SSIs above background.

LOD = Limit of Detection

LOQ = Limit of Quantitation

GPS = Groundwater Protection Standard

UPL = Upper Prediction Limit

^ = ICV, CCV, ICB, ISA, ISB, CRI, CRA, DLCK, OR MRL standard: Instrument related QC is outside acceptance limit

P = Parametric UPL with 1-of-2 retesting

DQ = Double Quantification Rule (not detected in background)

NP = Nonparametric UPL (highest background value)

**Notes:**

1. An individual result above the UPL or GPS does not constitute a statistically significant increase (SSI) above background or statistically significant level above the GPS. The cobalt GPS exceedances at MW-305 have been determined to be statistically significant. The cobalt GPS exceedance at MW-306 has been determined not to be statistically significant. Lithium and fluoride GPS exceedances have either been determined not to be statistically significant or the determination is ongoing. See the accompanying reporttext for additional information regarding determinations of statistical significance.
2. GPS is the United States Environmental Protection Agency (US EPA) Maximum Contamination Level (MCL), if established; otherwise, the values are from 40 CFR 257.95(h)(2)
3. Interwell UPLs calculated based on results from background well MW-301.

Created by: NDK  
Last revision by: NDK  
Checked by: RM  
Proj Mgr QA/QC: TK

Date: 5/1/2018  
Date: 1/19/2021  
Date: 1/19/2021  
Date: 1/20/2021



**Table 6. 2020 Groundwater Field Data Summary  
Ottumwa Generating Station - Ash Pond / SCS Engineers Project #25220072.00**

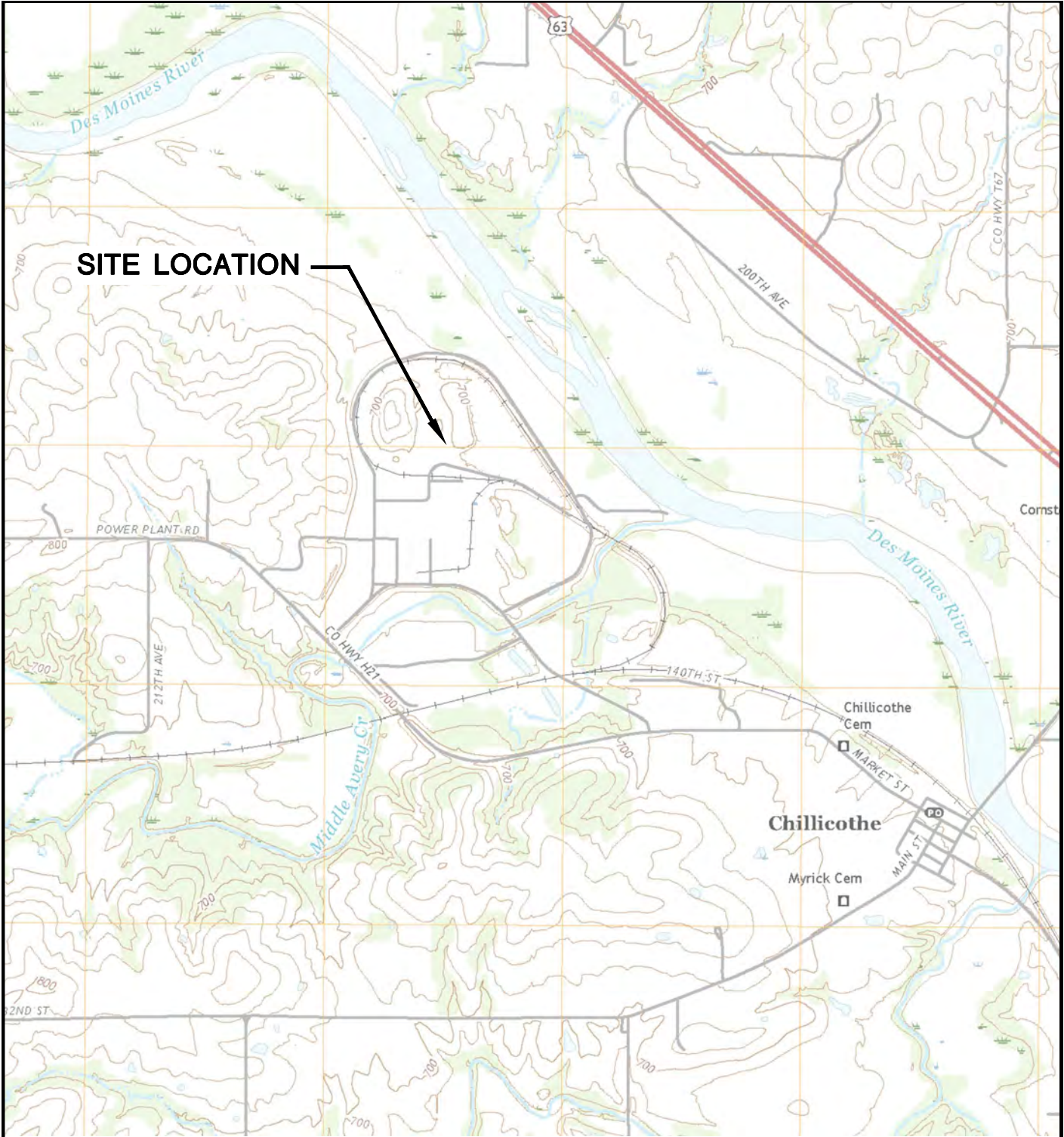
Well	Sample Date	Groundwater Elevation (feet)	Field Temperature (deg C)	Field pH (Std. Units)	Oxygen, Dissolved (mg/L)	Field Specific Conductance (umhos/cm)	Field Oxidation Potential (mV)	Turbidity (NTU)
MW-301	2/5/2020	683.30	5.38	6.39	7.28	966	68.0	1.43
	3/12/2020	682.82	6.90	6.48	5.31	962	258.5	1.33
	4/14/2020	683.25	8.70	6.58	5.14	939	176.3	0.87
	10/8/2020	682.34	15.40	6.22	4.20	1035	163.6	0.02
MW-302	4/14/2020	656.45	10.50	6.70	0.22	1971	135.6	31.10
	10/8/2020	655.80	14.40	7.00	0.14	2100	34.5	18.70
MW-303	4/14/2020	654.08	8.90	6.98	1.94	1097	104.3	12.10
	10/8/2020	650.37	17.00	8.28	0.13	1602	-0.4	30.20
MW-304	4/13/2020	656.42	11.90	7.12	0.24	1764	-119.8	54.10
	10/8/2020	652.95	13.60	7.88	0.18	1675	-113.0	11.10
MW-305	3/13/2020	661.41	12.40	7.02	0.20	1788	192.6	42.68
	4/13/2020	662.44	9.10	7.00	0.28	1772	6.6	21.70
	10/9/2020	659.81	14.00	7.44	0.13	1810	-13.0	12.90
MW-305A	3/13/2020	651.64	11.80	8.09	3.79	745	204.2	63.20
	4/14/2020	653.69	11.20	7.63	2.26	807	106.7	4.91
	10/9/2020	648.01	14.20	7.46	0.19	1102	11.0	--
MW-306	4/14/2020	670.71	11.70	6.68	0.21	1158	49.7	15.70
	10/9/2020	670.18	13.40	6.54	0.12	1294	41.4	14.00
MW-310	2/5/2020	644.71	12.49	7.08	0.68	1723	42.2	0.90
	3/12/2020	645.45	12.80	6.89	0.30	1902	252.2	2.77
	4/13/2020	645.91	10.30	7.00	0.22	1823	179.4	0.87
	10/12/2020	638.46	13.90	7.07	0.16	1709	146.5	0.02
MW-310A	3/13/2020	617.84	12.50	7.73	6.28	3160	178.9	109.00
	4/14/2020	647.50	8.80	7.85	6.39	2915	146.1	--
	10/12/2020	640.20	13.10	7.48	0.48	3122	89.7	--
MW-311	2/5/2020	645.00	10.21	6.72	2.11	891	21.0	1.89
	3/13/2020	644.18	10.00	7.11	0.23	877	222.6	3.44
	4/13/2020	646.79	8.80	6.86	0.29	912	103.4	0.44
	10/12/2020	638.73	14.40	6.93	7.12	1024	-53.0	--
MW-311A	3/13/2020	624.11	12.10	7.85	2.29	3336	206.0	7.74
	4/13/2020	648.42	7.90	8.40	3.87	3027	115.8	3.19
	6/30/2020	647.73	12.60	7.64	1.51	3391	23.4	1.43
	10/8/2020	641.09	12.70	8.33	0.44	3177	39.6	--

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

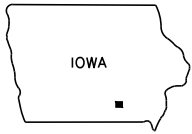
Date: 12/24/2020  
 Date: 1/12/2021  
 Date: 1/19/2021

## Figures

- 1 Site Location Map
- 2 Site Plan and Monitoring Well Locations
- 3 Shallow Potentiometric Surface, April 13-14, 2020
- 4 Deep Potentiometric Surface, April 13-14, 2020
- 5 Shallow Potentiometric Surface, October 5-12, 2020
- 6 Deep Potentiometric Surface, October 5-12, 2020

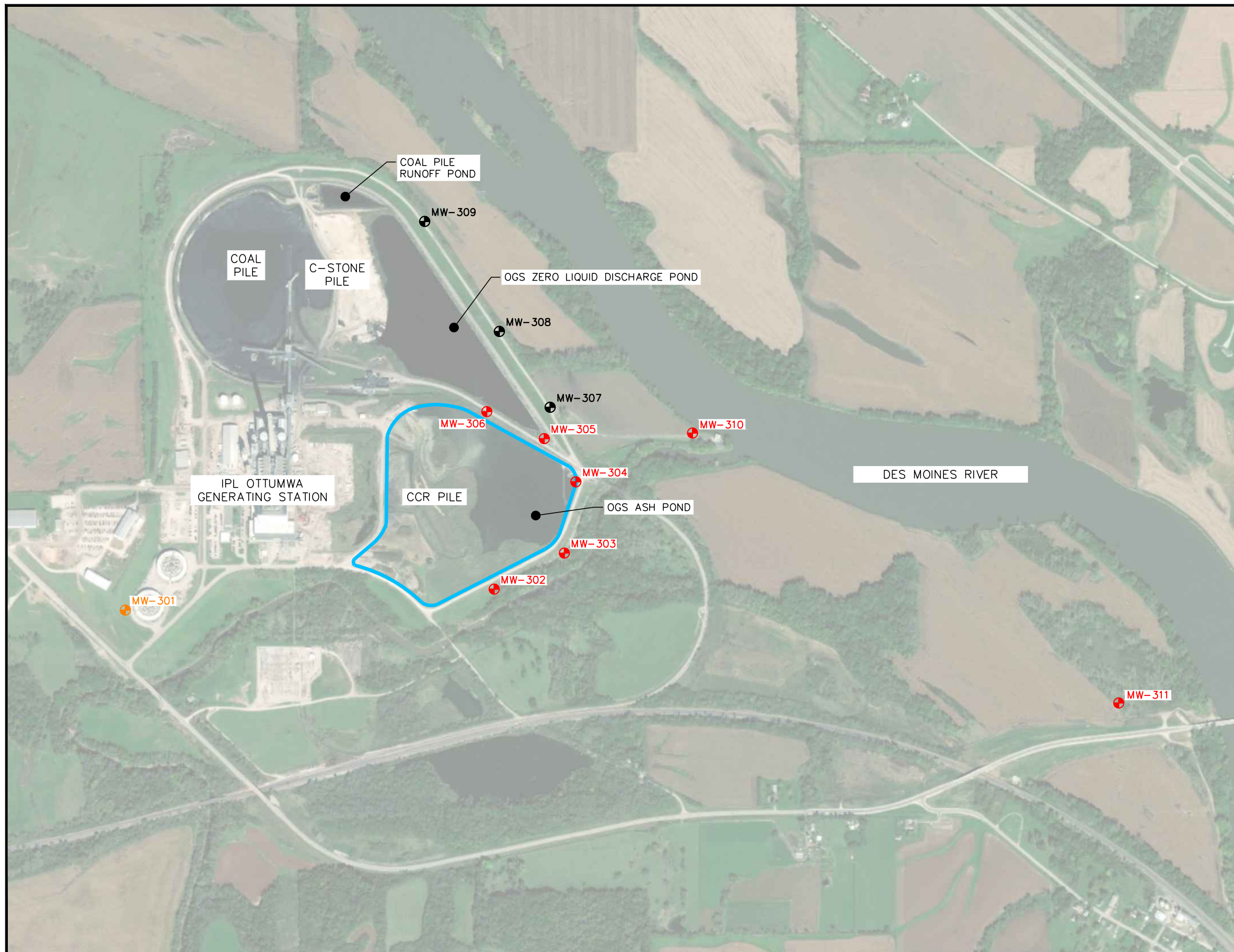


CHILLICOTHE QUADRANGLE  
 IOWA—WAPELLO CO.  
 7.5 MINUTE SERIES (TOPOGRAPHIC)  
 2018  
 SCALE: 1" = 2,000'



CLIENT	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501		SITE	ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA		ENGINEER	SITE LOCATION MAP	
	PROJECT NO.	25219072.00		DRAWN BY:	BSS		SCS ENGINEERS 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	FIGURE
DRAWN:	11/15/2019	CHECKED BY:	MDB	APPROVED BY:	TK 01/30/2020			
REVISED:	01/10/2020							

I:\25219072.00\Drawings\CCR 2019 Annual Report\Site Location Map.dwg, 1/30/2020 3:51:43 PM



LEGEND

- CCR UNIT
- CCR MONITORING WELL
- CCR BACKGROUND MONITORING WELL
- ADDITIONAL MONITORING WELL

NOTES:

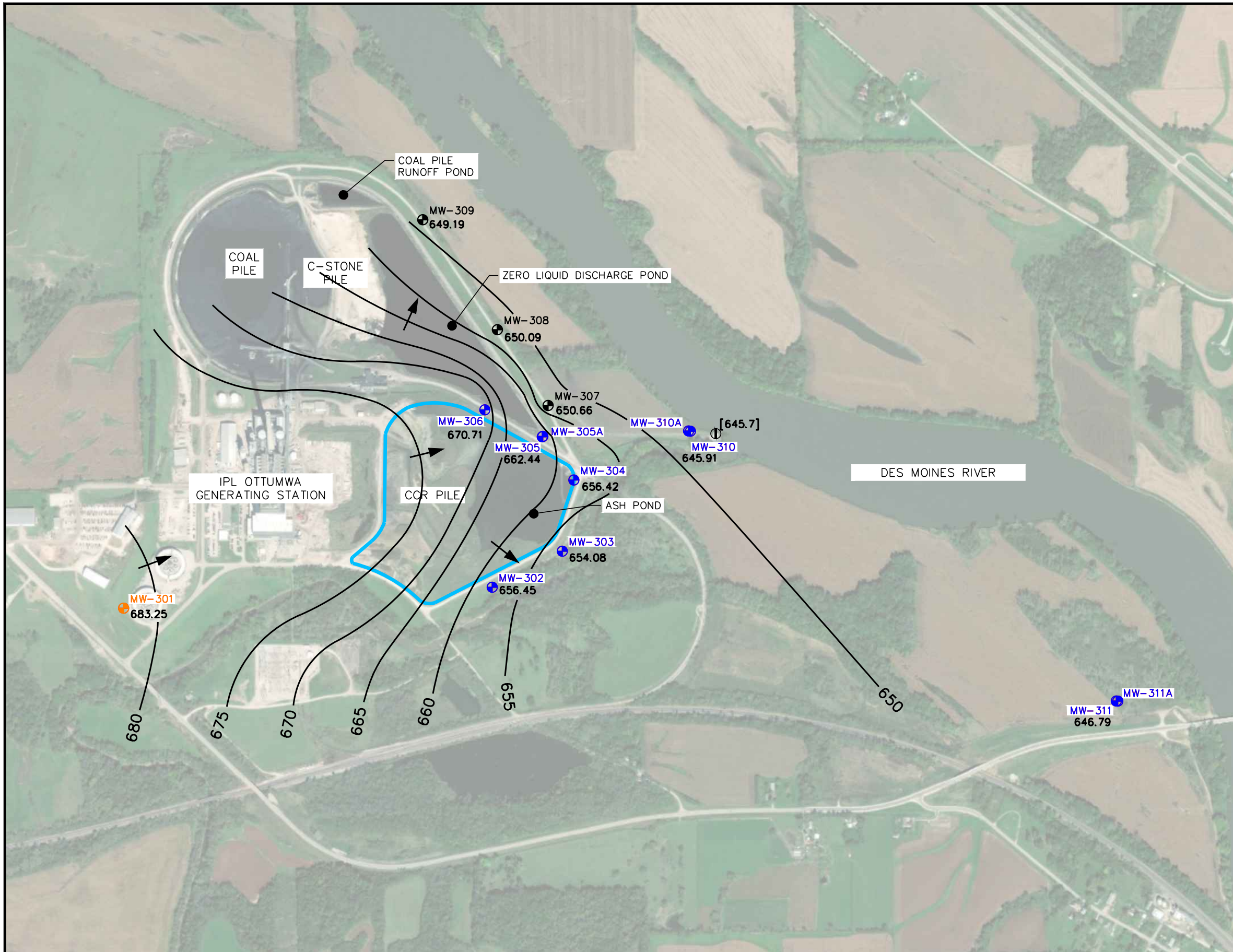
1. 2014 AERIAL PHOTOGRAPH SOURCES: ESRI, DIGITALGLOBE, GEOEYE, 1-CUBED, USDA FSA, USGS, AEX, GETMAPPING, AEROGRIID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY.
2. CCR UNIT LIMITS ARE APPROXIMATE.
3. MONITORING WELLS MW-301, MW-302, AND MW-304, WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM NOVEMBER 11-12, 2015.
4. MONITORING WELLS MW-303 AND MW-305 WERE INSTALLED BY CASCADE DRILLING LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 7-8, 2015.
5. MONITORING WELLS MW-307, MW-308, AND MW-309 WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM OCTOBER 25-27, 2016.
6. MONITORING WELLS MW-310 AND MW-311 WERE INSTALLED BY ROBERTS ENVIRONMENTAL DRILLING ON AUGUST 27, 2019.
7. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301.



SCALE: 1" = 800'

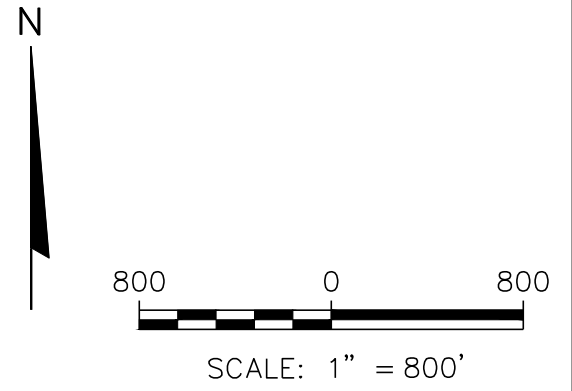
PROJECT NO. 25220072.00	DRAWN BY: BSS		CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SITE PLAN AND MONITORING WELL LOCATIONS-ASH POND	FIGURE
DRAWN: 11/15/2019	CHECKED BY: MDB					2
REVISED: 01/13/2020	APPROVED BY: TK 01/28/2021					

I:\25220072.00\Drawings\Site Plan and Monitoring Well Locations, Settling Pond and CCR Pile.dwg, 1/26/2021 12:42:41 PM

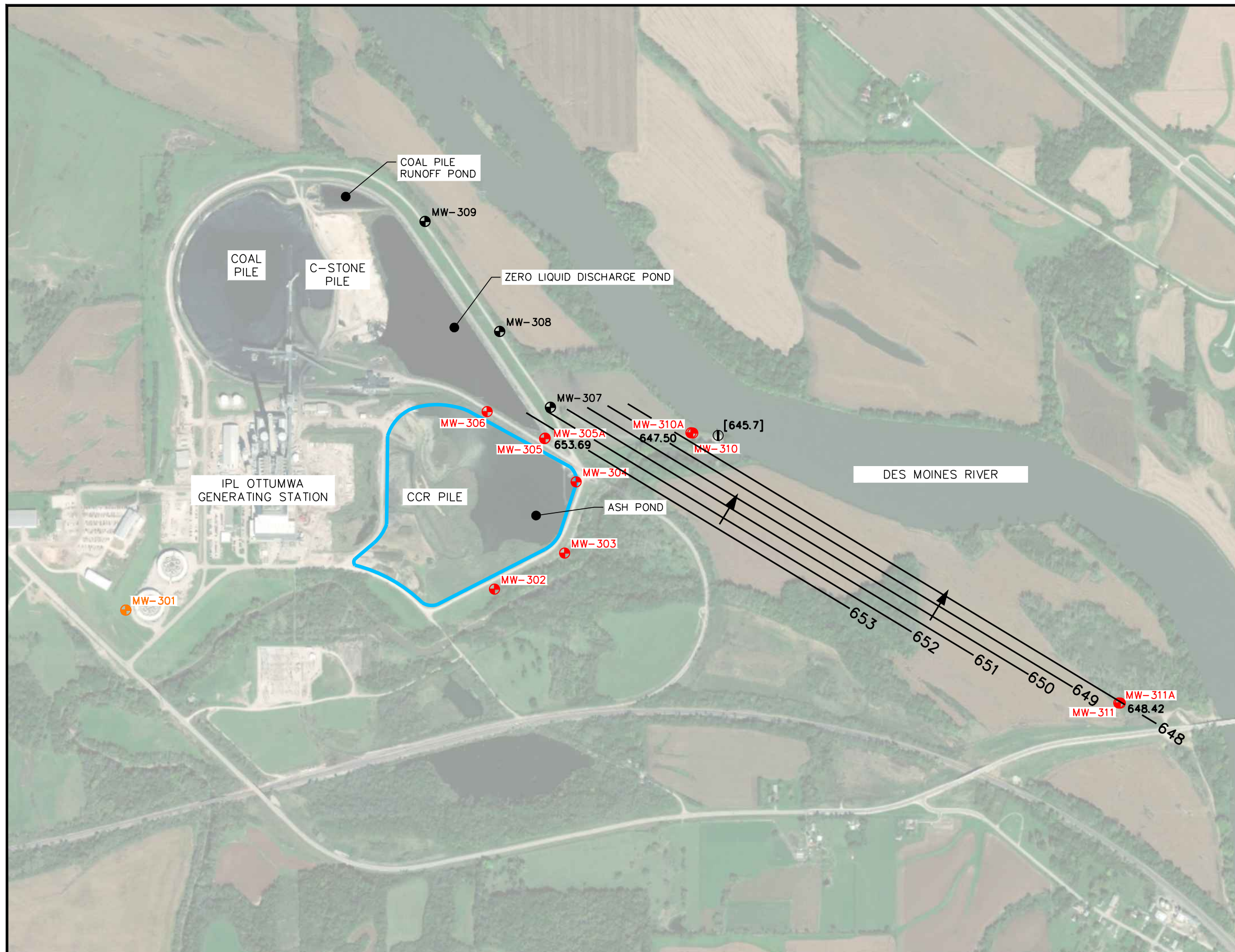


LEGEND	
	CCR UNIT
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
	ADDITIONAL MONITORING WELL
	RIVER ELEVATION MEASUREMENT LOCATION
<b>651.09</b>	POTENTIOMETRIC ELEVATION AT WELL (APRIL 13-14, 2020)
<b>[649.7]</b>	SURFACE WATER ELEVATION (APRIL 13, 2020)
	POTENTIOMETRIC SURFACE CONTOUR
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:  
 1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301



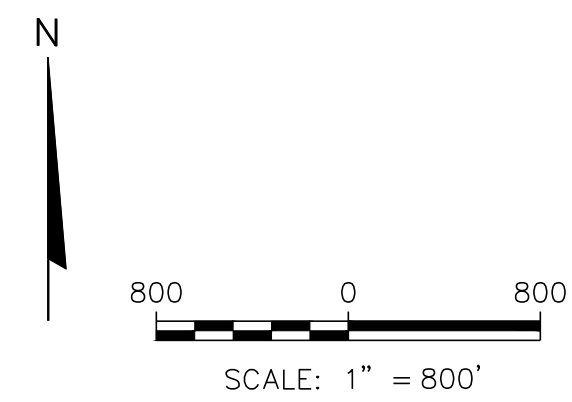
PROJECT NO. 25220072.00	DRAWN BY: KP/BSS	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SHALLOW POTENTIOMETRIC SURFACE APRIL 13-14, 2020	FIGURE
DRAWN: 04/28/2020	CHECKED BY: NDK/SCC					3
REVISED: 05/14/2020	APPROVED BY: TK 01/28/2021					



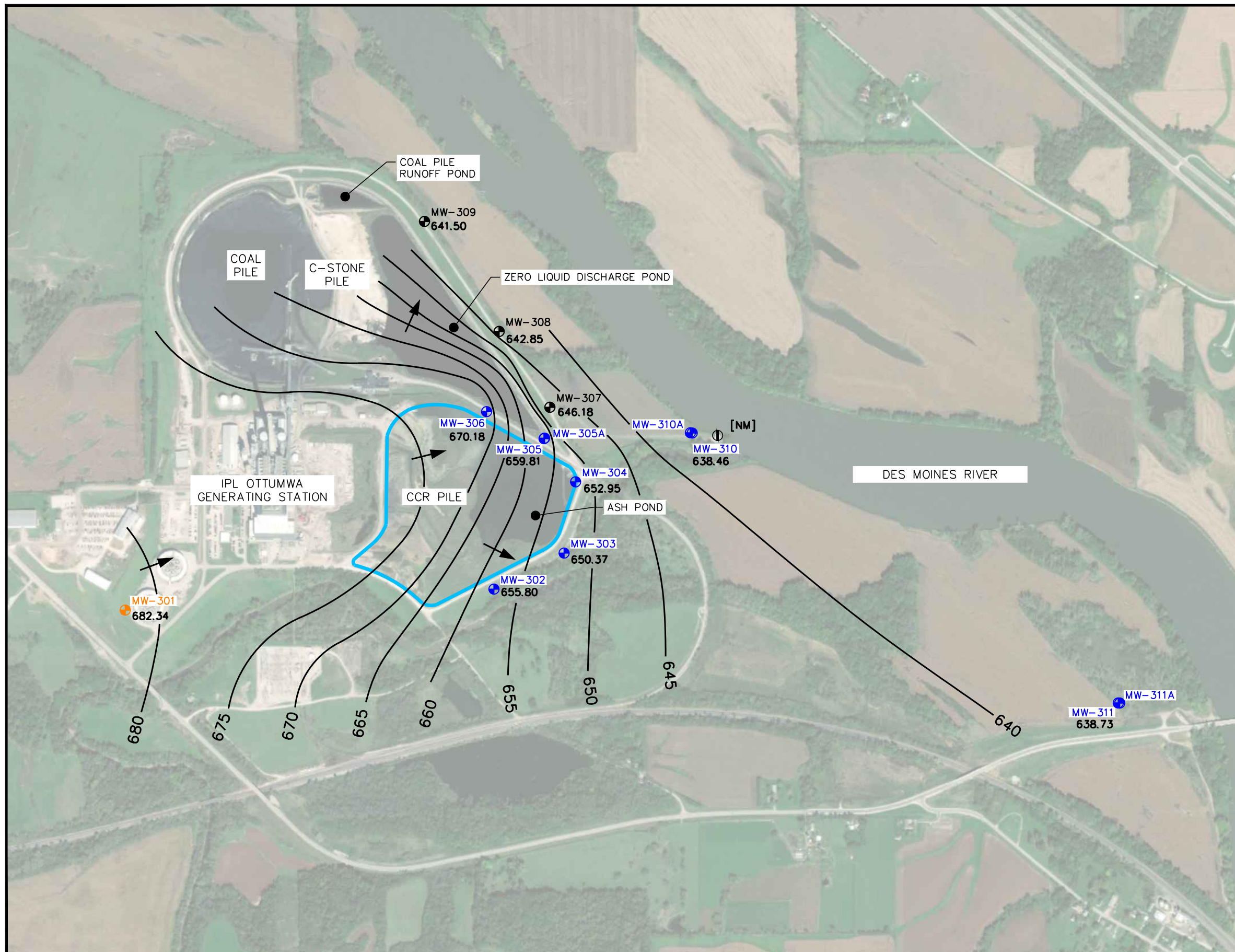
- LEGEND
- CCR UNIT
  - CCR MONITORING WELL
  - CCR BACKGROUND MONITORING WELL
  - ADDITIONAL MONITORING WELL
  - ⊕ RIVER ELEVATION MEASUREMENT LOCATION
  - 648.42** POTENTIOMETRIC ELEVATION AT WELL (APRIL 13-14, 2020)
  - [645.7]** SURFACE WATER ELEVATION (APRIL 13, 2020)
  - POTENTIOMETRIC SURFACE CONTOUR
  - ➔ APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

- THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301

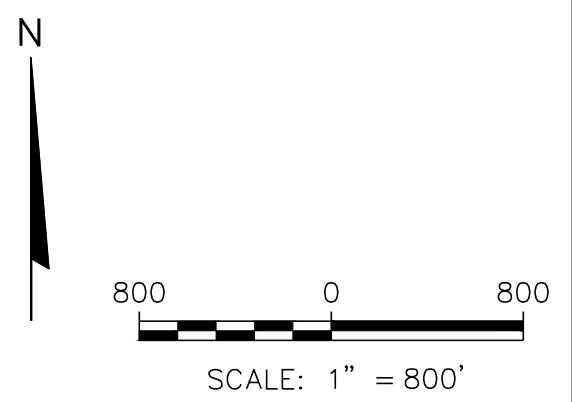


PROJECT NO. 25220072.00	DRAWN BY: KP/BSS	<b>SCS ENGINEERS</b> 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	DEEP POTENTIOMETRIC SURFACE APRIL 13-14, 2020	FIGURE 4
DRAWN: 04/28/2020	CHECKED BY: NDK/SCC					
REVISED: 05/14/2020	APPROVED BY: TK 11/20/2020					

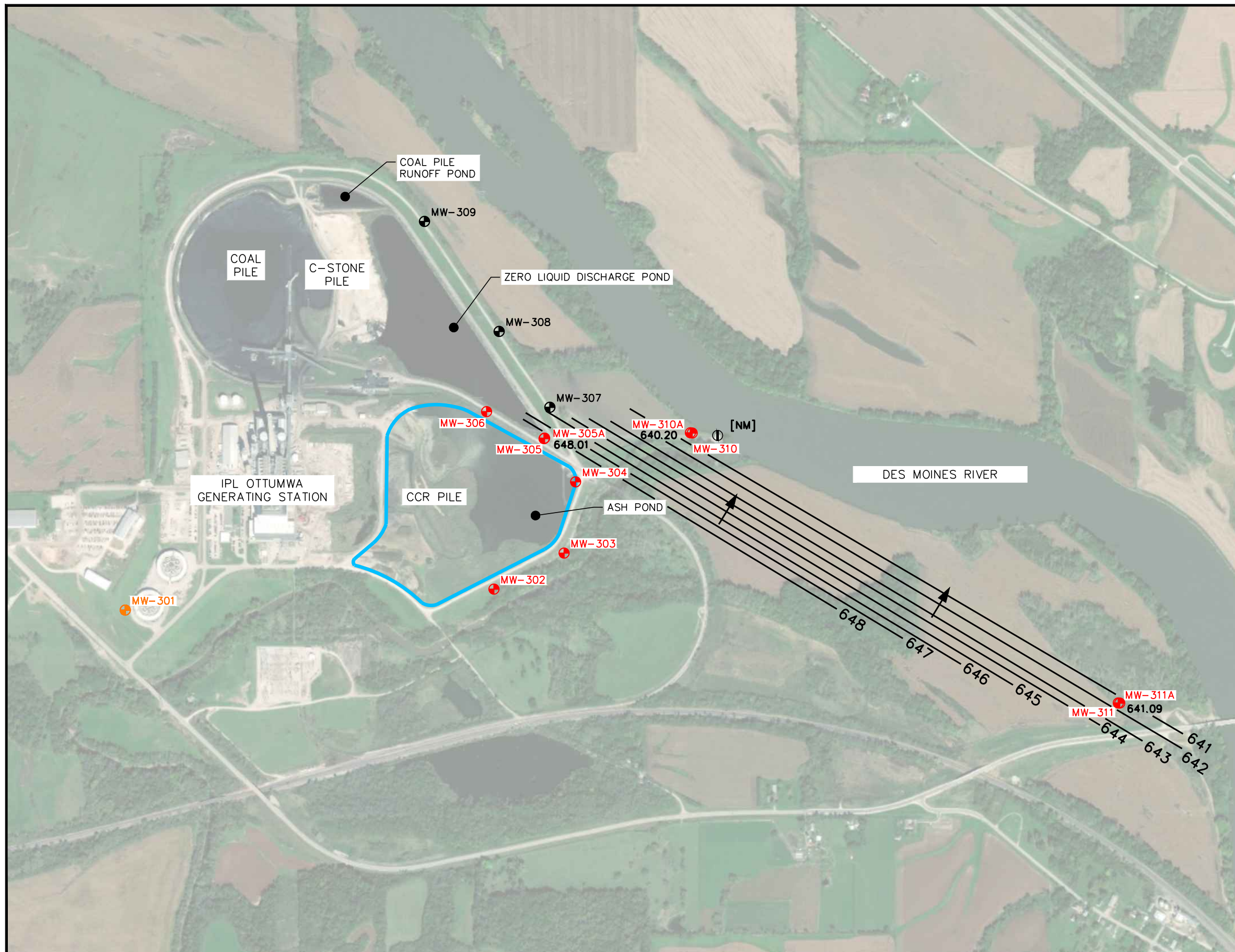


LEGEND	
	CCR UNIT
	CCR MONITORING WELL
	CCR BACKGROUND MONITORING WELL
	ADDITIONAL CCR MONITORING WELL
	RIVER ELEVATION MEASUREMENT LOCATION
<b>645.91</b>	POTENTIOMETRIC ELEVATION AT WELL (OCTOBER 5-12, 2020)
<b>[645.7]</b>	SURFACE WATER ELEVATION (OCTOBER 5-12, 2020)
	POTENTIOMETRIC SURFACE CONTOUR
	APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:  
 1. THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301



PROJECT NO. 25220072.00	DRAWN BY: KP/BSS/RJG/ZTW	 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	SHALLOW POTENTIOMETRIC SURFACE OCTOBER 5-12, 2020	FIGURE
DRAWN: 04/28/2020	CHECKED BY: TK					5
REVISED: 12/08/2020	APPROVED BY: TK 01/28/2021					




- LEGEND
- CCR UNIT
  - CCR MONITORING WELL
  - CCR BACKGROUND MONITORING WELL
  - ADDITIONAL MONITORING WELL
  - D RIVER ELEVATION MEASUREMENT LOCATION
  - 648.42** POTENTIOMETRIC ELEVATION AT WELL (OCTOBER 5-12, 2020)
  - [645.7]** SURFACE WATER ELEVATION (OCTOBER 5-12, 2020)
  - POTENTIOMETRIC SURFACE CONTOUR
  - ➔ APPROXIMATE GROUNDWATER FLOW DIRECTION

NOTE:

- THE BACKGROUND MONITORING WELL FOR THE OGS ASH POND IS MW-301

PROJECT NO.	25220072.00	DRAWN BY:	KP/BSS/ZTW	<b>SCS ENGINEERS</b> 2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830	CLIENT INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	SITE ALLIANT ENERGY OTTUMWA GENERATING STATION OTTUMWA, IOWA	DEEP POTENTIOMETRIC SURFACE OCTOBER 5-12, 2020	FIGURE
DRAWN:	04/28/2020	CHECKED BY:	TK					6
REVISED:	12/08/2020	APPROVED BY:	TK 01/28/2021					





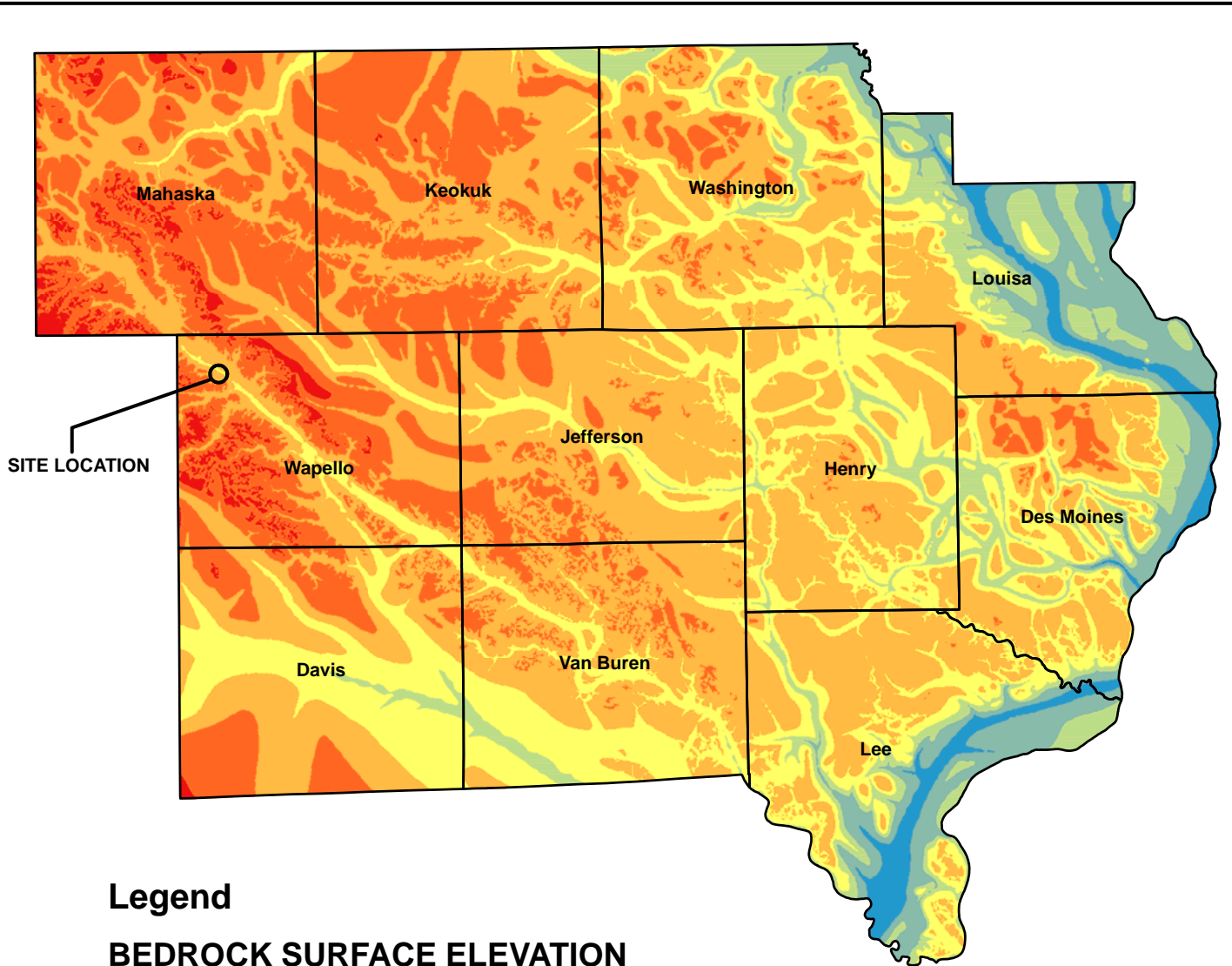
Appendix A  
Regional Hydrogeologic Information

**Table OGS-2. Regional Hydrogeologic Stratigraphy  
Ottumwa Midland Landfill / SCS Engineers Project #25215053.01**

Age of Rocks	Hydrogeologic Unit	General Thickness (feet)	Name of Rock Unit*	Type of Rock
Quaternary (0-1 million years old)	Surficial Aquifers • Alluvial • Buried-Channel • Drift	0 to 320	Undifferentiated	<ul style="list-style-type: none"> <li>• Sand, gravel, silt, and clay</li> <li>• Sand, gravel, silt, and clay</li> <li>• Till (sandy, pebbly clay), sand, and silt</li> </ul>
Pennsylvanian (180 to 310 million years old)	Aquiclude	0 to 370	Undifferentiated	<ul style="list-style-type: none"> <li>• Shale, sandstone, limestone, and coal</li> </ul>
Mississippian (310 to 345 million years old)	Mississippian Aquifer  • Upper	0 to 600	St. Louis Spergen	<ul style="list-style-type: none"> <li>• Limestone and sandstone</li> <li>• Limestone</li> </ul>
	• Lower		Warsaw Keokuk Burlington Hampton Starrs Cave	<ul style="list-style-type: none"> <li>• Shale and dolomite</li> <li>• Dolomite, limestone, and shale</li> <li>• Dolomite and limestone</li> <li>• Limestone and dolomite</li> <li>• Limestone</li> </ul>
	Aquiclude	0 to 425	Prospect Hill McCraney	<ul style="list-style-type: none"> <li>• Siltstone</li> <li>• Limestone</li> </ul>
Devonian (345 to 400 million years old)	Aquiclude	110 to 420	Yellow Spring Lime Creek	<ul style="list-style-type: none"> <li>• Shale, dolomite, and siltstone</li> <li>• Dolomite and shale</li> </ul>
	Devonian Aquifer		Cedar Valley Wapsipinicon	<ul style="list-style-type: none"> <li>• Limestone and dolomite</li> <li>• Dolomite, limestone, shale, and gypsum</li> </ul>
Silurian (400 to 425 million years old)		0 to 105	Undifferentiated	<ul style="list-style-type: none"> <li>• Dolomite</li> </ul>
Ordovician (425 to 500 million years old)	Aquiclude	150 to 600	Maquoketa Galena Decorah Platteville	<ul style="list-style-type: none"> <li>• Dolomite and shale</li> <li>• Dolomite and chert</li> <li>• Limestone and shale</li> <li>• Limestone, shale, and sandstone</li> </ul>
	Cambrian-Ordovician aquifer	750 to 1,110	St. Peter Prairie du Chien	<ul style="list-style-type: none"> <li>• Sandstone</li> <li>• Dolomite and sandstone</li> </ul>
Cambrian (500 to 600 million years old)		450 to 750+	Jordan St. Lawrence	<ul style="list-style-type: none"> <li>• Sandstone</li> <li>• Dolomite</li> </ul>
	Not considered an aquifer in southeast Iowa		Franconia Galesville Eau Claire Mt. Simon	<ul style="list-style-type: none"> <li>• Shale, siltstone, and sandstone</li> <li>• Sandstone</li> <li>• Sandstone, shale, and dolomite</li> <li>• Sandstone</li> </ul>
Precambrian (600 million to 2 billion + years old)				<ul style="list-style-type: none"> <li>• Sandstone, igneous rocks, and metamorphic rocks</li> </ul>

\*This nomenclature and classification of rock units in this report are those of the Iowa Geological Survey and do not necessarily coincide with those accepted by the U.S. Geological Survey.

Source: "Water Resources of Southeast Iowa," Iowa Geologic Survey Water Atlas No. 4.

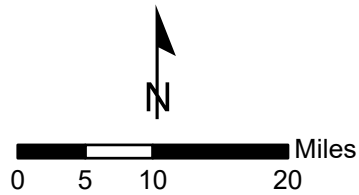


**Legend**

**BEDROCK SURFACE ELEVATION**

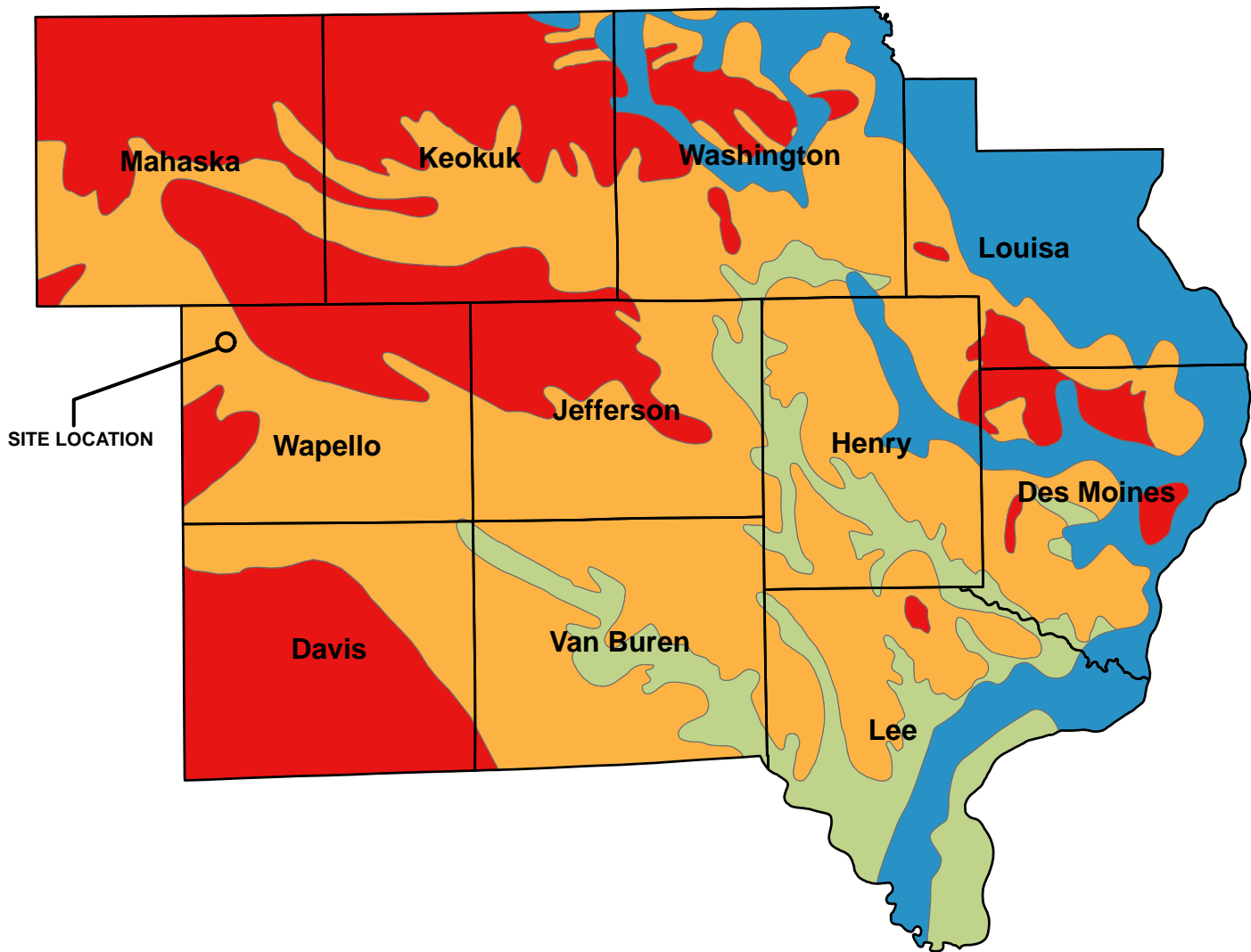
ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- BELOW 300
- 300 TO 400
- 400 TO 500
- 500 TO 600
- 600 TO 700
- 700 TO 800
- 800 TO 900



MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY  
 IOWA BEDROCK SURFACE ELEVATION AS OBTAINED  
 FROM IOWA NATURAL RESOURCES  
 GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

<b>CLIENT</b>	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	<b>SITE</b>	OTTUMWA GENERATING STATION OTTUMWA, IOWA	<b>SE IOWA REGIONAL BEDROCK SURFACE ELEVATION</b>		
	PROJECT NO. 25215053.03		DRAWN BY: JB	<b>ENGINEER</b>	<b>SCS ENGINEERS</b>	<b>FIGURE</b>
	DRAWN: 07/29/13		CHECKED BY: MDB			
REVISD: 05/29/15	APPROVED BY:					

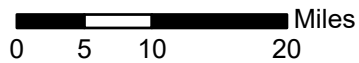


### Legend

#### MISSISSIPPIAN AQUIFER POTENTIOMETRIC SURFACE

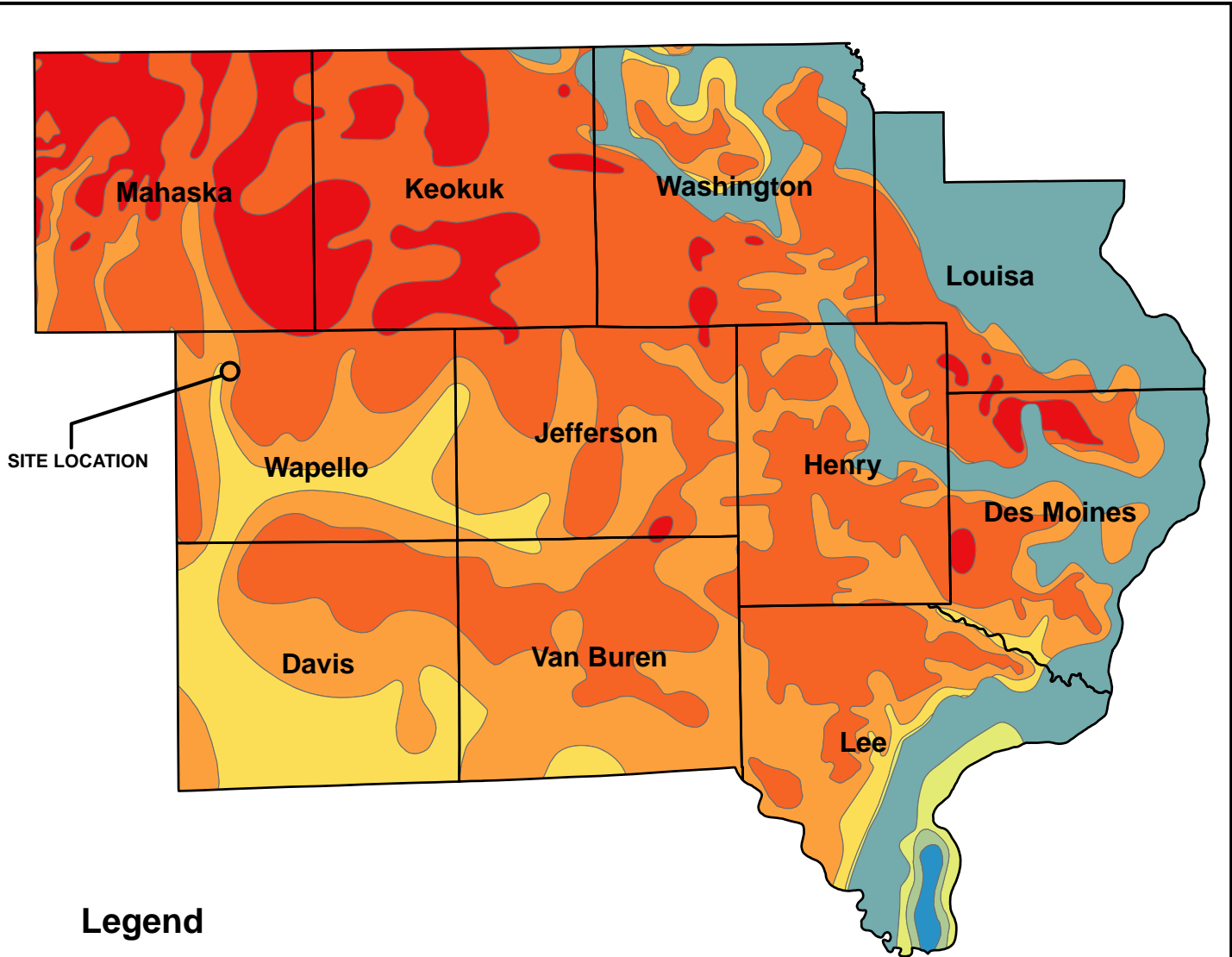
ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 550
- 650
- 750



MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY  
 MISSISSIPPIAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION AS OBTAINED  
 FROM IOWA NATURAL RESOURCES  
 GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

<b>CLIENT</b>	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	<b>SITE</b>	OTTUMWA GENERATING STATION OTTUMWA, IOWA	<b>SE IOWA REGIONAL MISSISSIPPIAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION</b>
PROJECT NO.	25215053.03	DRAWN BY:	JB	<b>SCS ENGINEERS</b> <small>2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 FAX: (608) 224-2839</small>
DRAWN:	07/29/13	CHECKED BY:	MDB	
REVISED:	05/29/15	APPROVED BY:		
				<b>FIGURE</b>

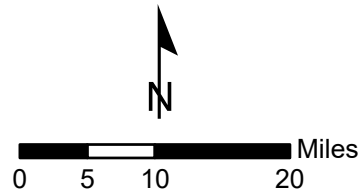


**Legend**

**MISSISSIPPIAN AQUIFER ELEVATION**


ELEVATION ABOVE MEAN SEA LEVEL IN FEET

- MISSISSIPPIAN NOT PRESENT
- 150
- 250
- 350
- 450
- 550
- 650
- 750



MAP DATA DERIVED FROM IOWA GEOLOGICAL AND WATER SURVEY  
 MISSISSIPPIAN AQUIFER SURFACE ELEVATION AS OBTAINED  
 FROM IOWA NATURAL RESOURCES  
 GEOGRAPHIC INFORMATION SYSTEMS LIBRARY

<b>CLIENT</b>	INTERSTATE POWER AND LIGHT CO. 20775 POWER PLANT ROAD OTTUMWA, IA 52501	<b>SITE</b>	OTTUMWA GENERATING STATION OTTUMWA, IOWA	<b>SE IOWA REGIONAL MISSISSIPPIAN AQUIFER SURFACE ELEVATION</b>
PROJECT NO. 25215053.03	DRAWN BY: JB	<b>ENGINEER</b>	<b>SCS ENGINEERS</b>	
DRAWN: 07/29/13	CHECKED BY: MDB		2830 DAIRY DRIVE MADISON, WI 53718-6751 PHONE: (608) 224-2830 FAX: (608) 224-2839	
REVISED: 05/29/15	APPROVED BY:		<b>FIGURE</b>	



Appendix B  
Boring Logs and Well Construction Documentation

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

Facility/Project Name IPL- Ottumwa Generating Station SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number MW-301	
Boring Drilled By: Name of crew chief (first, last) and Firm Todd Schmalfeld Cascade Drilling		Date Drilling Started 11/10/2015		Date Drilling Completed 11/10/2015	
Unique Well No.		DNR Well ID No.		Common Well Name MW-301	
Final Static Water Level Feet		Surface Elevation 684.3 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 400,077 N, 1,899,709 E S/C/N		Lat _____ ° _____ ' _____ "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NW 1/4 of SW 1/4 of Section 26, T 73 N, R 15 W		Long _____ ° _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County Wapello		Civil Town/City/ or Village Ottumwa	

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	TOPSOIL.	TOPSOIL										
S1	10	woh 1 39	2-6	SANDY SILT WITH GRAVEL, gray (7.5YR 6/1), gravel is fine.	ML										
S2	13	24 50	8	WEATHERED SANDSTONE, very weak, light gray matrix (10YR 7/1), secondary color very dark gray 910YR 3/1), massive.											
S3	5	50	11		SANDSTONE										
S4	6	50	13												
S5	4	50	15	Endo of Boring at 15 feet bgs.											

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

Signature 	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Route To:  Watershed/Wastewater  Waste Management   
 Remediation/Redevelopment  Other

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-302</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/10/2015</b>		Date Drilling Completed <b>11/10/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-302</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>671.6 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>400,267 N, 1,902,625 E S/C/N</b>		Lat <b>° ' "</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W		Long <b>° ' "</b>		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

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	TOPSOIL.	TOPSOIL										
			2	LEAN CLAY WITH SAND, dark gray (10YR 4/1).											
			3												
			4												
			5												
			6												
			7												
			8		CL										
			9												
			10												
S1	19	14 57	11								M				
			12												
S2	19	24 711	13								M				
			14	LEAN CLAY WITH SAND, very dark gray (5Y 3/1).											
			15		CL										
			16												

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Boring Number MW-302

Page 2 of 2

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	24	23 99	17	POORLY GRADED SAND, olive yellow (2.5Y 6/6).	SP									
			18	LEAN CLAY, dark grayish brown (10YR 4/2).	CL									
S4	24	44 44	19	POORLY GRADED GRAVEL, fine.	GP									saturation @ 18 ft bgs.
			20	LEAN CLAY, brownish yellow (10YR 6/8).	CL									
S5	15	23 36	21	POORLY GRADED GRAVEL WITH CLAY, gray (10YR 5/1), fine.										
			22		GP-GC									
S6	24	34 89	23											
			24	POORLY GRADED SAND, gray (10YR 5/1), medium grained.										
S7	24	43 68	25		SP									
			26											
			27											
S8	24	78 119	28	Same as above, but brown (10YR 5/3).										
			29	POORLY GRADED SAND, gray (10YR 5/1), fine grained, (weathered bedrock?).										
			30	Medium grained.										
S9	23	514 3350/4	31		SP									
			32											
S10	12	250/3	33											
			34	POORLY GRADED SAND, olive yellow (2.5Y 7/1), fine grained, (weathered bedrock?).										
			35											
S11	3	50/3	36		SP									
			37	End of Boring at 37 feet bgs.										

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-303</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>12/8/2015</b>		Date Drilling Completed <b>12/8/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-303</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>659.0 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/>		State Plane <b>400,583 N, 1,903,215 E S/C/N</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
NE 1/4 of SE 1/4 of Section 26, T 73 N, R 15 W		Lat _____ ' _____ "		Long _____ ' _____ "	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	FILL, boring location was cleared to 9' bgs by hydrovac, then back filled.										
			2											
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10	WEATHERED SANDSTONE, medium grained, brown (10YR 5/4).										
S1	I	50	11	SANDSTONE										
			12											
			13											
S2	NR		14											
			14.5	End of Boring at 14.5 ft bgs.										

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

Signature: *[Handwritten Signature]* for Kyle Kauer Firm: **SCS Engineers** 2830 Dairy Drive Madison, WI 53718 Tel: (608) 224-2830 Fax:

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-304</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/11/2015</b>		Date Drilling Completed <b>11/11/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-304</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>680.1 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,152 N, 1,903,287 E S/C/N</b>		Lat _____ ' _____ "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Long _____ ' _____ "		Feet <input type="checkbox"/> S Feet <input type="checkbox"/> W	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	TOPSOIL.	TOPSOIL									
			2	FAT CLAY, black (10YR 2/1).										
			3											
			4											
			5											
			6											
			7		CH									
			8											
			9											
			10											
S1	23	4 5 4 5	11								M			
			12											
			13	FAT CLAY, yellowish brown (10YR 5/4).										
S2	19.5	4 4 5 5	14		CH						M			
			15	FAT CLAY, yellowish brown (10YR 3/4).										
			16		CH									

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

Signature for Kyle Kramer

Firm **SCS Engineers**  
2830 Dairy Drive Madison, WI 53718

Tel: (608) 224-2830  
Fax:

Boring Number MW-304

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	12	33 45	17	FAT CLAY, yellowish brown (10YR 3/4). (continued)										
S4	22	43 712	18											
S5	23	27 89	19											
S6	23	34 86	20											
S7	23	511 1511	21											CH
S8	15	44 56	22											
S9	18	46 99	23											
S10	24	46 76	24											
S11	16	22 46	25											FAT CLAY, DARK OLIVE BROWN (2.5Y 3/3).
S12	24	43 55	26											
S13	18	23 33	27											CH
			28											
			29											
			30											
			31											
			32											
			33											
			34											
			35											
			36											
			37											
			38											
			39											
			40											
			41											
			42											

Boring Number MW-304

Page 3 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S14	24	3 4	43	FAT CLAY, DARK OLIVE BROWN (2.5Y 3/3). <i>(continued)</i>	CH									
		9 14	44	SANDY SILT, very dark gray.	ML					W				
S16	15	30 50/4	45	POORLY GRADED SAND, medium grained, gray (5Y 6/1), (weathered bedrock).	SP									
			46											
S17	5	33 50/2	47											
			48		W									
S18		50/4	49											
			50		W									
			51											
			52	End of Boring at 52 feet bgs.										

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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-305</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>			Date Drilling Started <b>12/7/2015</b>		Date Drilling Completed <b>12/8/2015</b>
Unique Well No.	DNR Well ID No.	Common Well Name <b>MW-305</b>	Final Static Water Level <b>Feet</b>		Surface Elevation <b>681.5 Feet</b>
					Borehole Diameter <b>8.5 in</b>
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane <b>401,473 N, 1,903,023 E S/C/N</b>			Lat <input type="checkbox"/> ° <input type="checkbox"/> ' <input type="checkbox"/> "		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W			Long <input type="checkbox"/> ° <input type="checkbox"/> ' <input type="checkbox"/> "		Feet <input type="checkbox"/> S <input type="checkbox"/> W
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	


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			
			0	TOPSOIL	TOPSOIL											
			1	GRAVEL	GP											
			2	FAT CLAY												
			3													
			4													
			5													
			6													
			7													
			8													
			9		CH											
			10													
			11	FAT CLAY, very dark grayish brown (10YR 3/2).												
S1	18	36 9 11	11													
			12													
			13	same as above except, brown (10YR 4/3).												
S2	22	37 14 22	13													
			14													
			15													
			16													

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

Signature 	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Boring Number MW-305

Page 2 of 3

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	22	5 15 14 15	17	FAT CLAY (continued)										
S4	20	3 5 13 15	18 19		CH									
S5	24	4 5 7 11	20 21 22	FAT CLAY WITH SILT, dark gray (10YR 4/1).					M					
S6	20	7 11 15 20	23 24	same as above except, very dark brown (10YR 2/2).					M					
S7	24	4 8 11 12	25 26 27	same as above except, very dark gray (10YR 3/1).	CH				M					
S8	24	8 12 16 21	28 29						M					
S9	13	4 4 7 12	30 31 32						M					
S10	24	5 6 9	33 34	LEAN CLAY, very dark brown (10YR 2/2).					W					
S11	24	4 4 5 7	35 36 37		CL				W					
S12	22	2 2 3 5	38 39	same as above except, very dark grayish brown (10YR 3/2).					W					
S13	6	3 9 11	40 41 42	POORLY GRADED SANDY GRAVEL, fine, brown (10YR 4/3).	GPS				W				water @ 41.0 ft bgs.	

Boring Number MW-305

Page 3 of 3

Sample			Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
Number and Type	Length Att. & Recovered (in)	Blow Counts							Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
S14	22	23 50	43	POORLY GRADED SAND, medium grained, yellowish brown (10YR 5/4), (weathered bedrock). <i>(continued)</i>	SP										
			44												
			45												
S15	6	5 10 50	46		SP										
			47												
			48												
S16	6	50	49												
			50	End of Boring at 50 ft bgs.											



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

Facility/Project Name <b>IPL- Ottumwa Generating Station</b> SCS#: 25215135.40		License/Permit/Monitoring Number		Boring Number <b>MW-306</b>	
Boring Drilled By: Name of crew chief (first, last) and Firm <b>Todd Schmalfeld Cascade Drilling</b>		Date Drilling Started <b>11/12/2015</b>		Date Drilling Completed <b>11/12/2015</b>	
Unique Well No.		DNR Well ID No.		Common Well Name <b>MW-306</b>	
Final Static Water Level <b>Feet</b>		Surface Elevation <b>681.1 Feet</b>		Borehole Diameter <b>8.5 in</b>	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/>		State Plane <b>401,666 N, 1,902,629 E S/C/N</b>		Local Grid Location <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W		Lat _____ ° _____ ' _____ "		Long _____ ° _____ ' _____ "	
Facility ID		County <b>Wapello</b>		Civil Town/City/ or Village <b>Ottumwa</b>	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1	TOPSOIL.	TOPSOIL									
			2	FAT CLAY, dark olive brown (2.5Y 3/3).										
			3											
			4											
			5											
			6											
			7		CH									
			8											
			9											
			10											
S1	18	36 9 11	11								M			
			12											
S2	22	56 7 9	13	FAT CLAY, gray (10YR 5/1).	CH						M			
			14											
			15											
			16											

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

Signature <i>Kyle Kramer</i>	Firm <b>SCS Engineers</b> 2830 Dairy Drive Madison, WI 53718	Tel: (608) 224-2830 Fax:
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Boring Number MW-306

Page 2 of 2


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S3	22	5 10 10 14	17	FAT CLAY, gray (10YR 5/1). (continued) FAT CLAY, gray (10YR 5/1).	CH				M					
S4	13	5 8 14 17	18 19	FAT CLAY, dark olive brown (2.5Y 3/3).					M					
S5	15	5 6 13 16	21 22		CH				W					
S6	15	3 5 7 9	23 24						W					
S7	22	2 5 7 11	26 27	POORLY GRADED SAND, very dark grayish brown (10YR 3/2), medium to coarse grained, (weathered bedrock?).					W					
S8	NR	7 3 4 3	28 29						W					
S9	18	1 1 2 2	31 32		SP				W					
S10	13	WOR	33 34						W					
				End of Boring at 34.5 feet bgs.										

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

Facility/Project Name IPL - Ottumwa Generating Station SCS#: 25219028.00		License/Permit/Monitoring Number		Boring Number MW-310	
Boring Drilled By: Name of crew chief (first, last) and Firm Eric Wetzel Roberts Environmental Drilling, Inc.			Date Drilling Started 8/27/2019	Date Drilling Completed 8/27/2019	Drilling Method 4 1/4 hollow stem auger
WI Unique Well No.	DNR Well ID No.	Common Well Name MW-310	Final Static Water Level Feet MSL	Surface Elevation 655.76 Feet MSL	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 401,502 N, 1,904,206 E S/C/N 1/4 of 1/4 of Section , T N, R			Local Grid Location Lat _____ " Feet <input type="checkbox"/> N Feet <input type="checkbox"/> E Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Wapello	County Code	Civil Town/City/ or Village Ottumwa	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FTD	Soil Properties					ROD/ Comments	
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			1	Hydrovac through clay for utility clearances											
			2												
			3												
			4												
			5												
			6												
			7												
			8	LEAN CLAY, brown, massive											
S1	11	WOR 10 10	9	Some reddish brown and grey mottling, some silt.							M				
			10												
S2	15	22 32	11								M				
			12												
S3	20	11 19	13								M/W				
			14	SHLT, brown, with clay											
			15												

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

Signature 	Firm SCS Engineers 2830 Dairy Drive Madison, WI 53718	Tel: 608-224-2830 Fax
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This form is authorized by Chapters 281, 283, 289, 291, 292, 293, 295, and 299, Wis. Stats. Completion of this form is mandatory. Failure to file this form may result in forfeiture of between \$10 and \$25,000, or imprisonment for up to one year, depending on the program and conduct involved. Personally identifiable information on this form is not intended to be used for any other purpose. NOTE: See instructions for more information, including where the completed form should be sent.

Boring Number **MW-310** Use only as an attachment to Form 4400-122 Page **2** of **2**


Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
S4	24	WOR	16		ML				M/W					
S5	18	13 23	17	POORLY GRADED SAND, fine to medium, 1/2" coarse sand seam at 17.75'					W					
S6	14	WOR WOR 23	19						W					
S7	10	WOR 2 42	21		SP				W					
			22	Trace small rounded gravel										
S8	24	66 1120	23						W					
			24	End of boring at 24'										

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

Facility/Project Name IPL - Ottumwa Generating Station SCS#: 25219028.00		License/Permit/Monitoring Number		Boring Number MW-311	
Boring Drilled By: Name of crew chief (first, last) and Firm Eric Wetzel Roberts Environmental Drilling, Inc.			Date Drilling Started 8/27/2019	Date Drilling Completed 8/27/2019	Drilling Method 4 1/4 hollow stem auger
WI Unique Well No.	DNR Well ID No.	Common Well Name MW-311	Final Static Water Level Feet MSL	Surface Elevation 651.24 Feet MSL	Borehole Diameter 8.5 in.
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 399,350 N, 1,907,603 E S/C/N 1/4 of 1/4 of Section T N. R.			Local Grid Location Lat _____ " Feet <input type="checkbox"/> N <input type="checkbox"/> E Long _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Wapello	County Code	Civil Town/City/ or Village Ottumwa	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments			
									Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200				
S1	14	23 4.6	1	LEAN CLAY, brown, massive, trace fine to medium sand, roots, 1" sand seam at 1.5'	CL												
S2	14	33 4.6	4		CL												
S3	6	23 4.6	6	SILT, brown, massive.	ML												
S4	20	23 4.5	8	LEAN CLAY, brown, massive.	CL												
S5	12	23 4.5	10	POORLY GRADED SAND, fine to medium, brown massive.													
S6	14	12 4.2	12	2" clay seam at 10.5'													
S7	14	12 3.3	14		SM												


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

Signature:  Firm: SCS Engineers  
2830 Dairy Drive Madison, WI 53718 Tel: 608-224-2830 Fax


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**SOIL BORING LOG INFORMATION SUPPLEMENT**  
 Form 4400-122A


Boring Number **MW-311** Use only as an attachment to Form 4400-122. 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	End of boring at 16'	SI									

Facility/Project Name IPL-Ottumwa Generating Station		SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-305A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services				Date Drilling Started 2/25/2020		Date Drilling Completed 2/27/2020	
DNR Well ID No.		Common Well Name MW-305A		Final Static Water Level 32.7 Feet		Surface Elevation 681.76 Feet	
						Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 401,461 N, 1,903,028 E S/C/N SE 1/4 of NE 1/4 of Section 26, T 73 N, R 15 W				Lat _____ ° _____ ' _____ " _____ ° _____ ' _____ "		Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> S      Feet <input type="checkbox"/> E <input type="checkbox"/> W	
Facility ID		County Wapello		County Code		Civil Town/City/ or Village Ottumwa	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Hydrovaced to 9.5 feet for utility clearance.										Drilled using hollow stem augers to 55 feet
				Blind drilled to 46 feet. See boring log MW-305 for lithology.										

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

Signature 	Firm <b>scs engineers</b>	Tel: Fax:
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Boring Number **MW-305A** Use only as an attachment to Form 4400-122. Page **2** of **4**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40											




Boring Number **MW-305A** Use only as an attachment to Form 4400-122. Page **3** of **4**

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	
			41											Bagged auger samples to ~40 feet
			42											
			43											
			44											
			45											Switched to mud rotary drilling at 45 feet
S1	5	50/5	46	POORLY GRADED SAND, fine, light brown, (weathered sandstone bedrock).										
			47											
			48											
			49											
			50											
			51											
			52											
			53		SP									
			54											
			55	Same as above but very fine, light brown to light gray, with pieces of rock.										Switched to air rotary drilling at 55 feet
			56											
			57											
			58											
			59											
			60	SANDSTONE, fine to medium, light brown, trace gravel and light gray to gray limestone, (bedrock).										Driller noted rock became more compitant at 59' bgs.
			61											
			62											
			63											
			64											
			65											

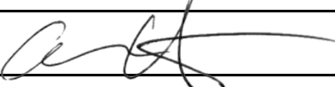
Boring Number **MW-305A** Use only as an attachment to Form 4400-122. Page **4** of **4**

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	
			66 67 68 69 70 71 72 73 74 75 76 77 78 79 80	LIMESTONE, light gray, with fine, light brown sandstone, (bedrock).										
				LIMESTONE, gray, with dark brownish gray shale, (bedrock).										
				SANDSTONE, fine, light grayish white, with gray limestone, (bedrock).										
				End of boring at 80 feet below ground surface.										At 68 feet, driller noted a fracture in the bedrock.

Facility/Project Name IPL-Ottumwa Generating Station		SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-310A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services				Date Drilling Started 2/27/2020		Date Drilling Completed 3/2/2020	
DNR Well ID No.		Common Well Name MW-310A		Final Static Water Level 12.0 Feet		Surface Elevation 655.26 Feet	
						Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane 401,504 N, 1,904,191 E S/C/N SW 1/4 of NW 1/4 of Section 25, T 73 N, R 15 W				Lat _____ ° _____ ' _____ "		Local Grid Location Feet <input type="checkbox"/> N <input type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
Facility ID		County Wapello		County Code		Civil Town/City/ or Village Ottumwa	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Hydrovaced to 8 feet for utility clearance.										Drilled using hollow stem augers to 40 feet
				Blind drilled to 24 feet. See boring log MW-310 for lithology.										

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

Signature 	Firm scs engineers	Tel: Fax:
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Boring Number **MW-310A** Use only as an attachment to Form 4400-122. Page **2** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16											
			17											
			18											
			19											
			20											
			21											
			22											
			23											
			24											
S1	14	7 20 23 21	25	POORLY GRADED SAND, fine to coarse, brown, trace gravel and lenses of lean clay.	SP									
			26	POORLY GRADED SAND, fine, light gray, trace lean clay, (weathered sandstone bedrock).										
S2	17	9 11 12 13	27	Same as above but brown with small gravel.										
S3	13	14 36 50/5	29	Same as above but fine to medium and brown to light gray.										
S4	5	50/5	31	Same as above but fine and light gray.										
S5	5	50/5	33		SP									
S6	5	50/5	35											
S7	5	50/5	37											
S8	4	50/4	39	Same as above but much more competent.										Auger refusal at 39 feet
			40											

Boring Number **MW-310A** Use only as an attachment to Form 4400-122. Page **3** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	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												
S9			41	LIMESTONE, light brownish gray, with fine to medium light gray sandstone, (bedrock).	SP																				
			42																						
			43	Same as above but with gravel and very little sand.																					
			44																						
			45																						
			46																						
			47																						
			48																						
			49																						
			50																						
			51																						
			52																						
			53																						
		54	End of boring at 54 feet below ground surface.																						

Switching to air rotary drilling at 40 feet  
 Intermittent gravel between 43 to 54 feet

Facility/Project Name IPL-Ottumwa Generating Station      SCS#: 25220056.00		License/Permit/Monitoring Number		Boring Number MW-311A	
Boring Drilled By: Name of crew chief (first, last) and Firm Jeff Crank Roberts Environmental Services		Date Drilling Started 3/2/2020		Date Drilling Completed 3/3/2020	
DNR Well ID No.		Common Well Name MW-311A		Final Static Water Level 8.9 Feet	
				Surface Elevation 651.16 Feet	
				Borehole Diameter 10" and 6" in.	
Local Grid Origin <input type="checkbox"/> (estimated: <input type="checkbox"/> ) or Boring Location <input checked="" type="checkbox"/> State Plane      399,349 N, 1,907,615 E      S/C/N			Local Grid Location		
SW 1/4 of SE 1/4 of Section 25, T 73 N, R 15 W			Lat _____ ° _____ ' _____ "      Feet <input type="checkbox"/> N      Feet <input type="checkbox"/> E		
			Long _____ ° _____ ' _____ " <input type="checkbox"/> S <input type="checkbox"/> W		
Facility ID		County Wapello		County Code	
				Civil Town/City/ or Village Ottumwa	

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	U S C S	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			1 2 3 4 5 6 7 8 9 10 11 12 13 14 15	Blind drilled to 16 feet. See boring log MW-311 for lithology.									Drilled using hollow stem augers to 28 feet	

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

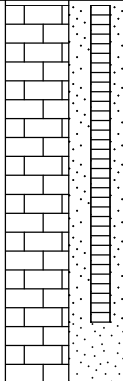
Signature	Firm    scs engineers	Tel: Fax:
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Boring Number **MW-311A** Use only as an attachment to Form 4400-122. Page **2** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Standard Penetration	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			16	POORLY GRADED SAND, fine to coarse, brown, with trace gravel and silt.										
S1	2		17							W				Began collecting split spoon samples at 16 feet
S2	11	4 5 6 7	19							W				
S3	12	5 5 6 7	21		SP					W				
S4		7 8 9 8	23							W				No return
S5		3 3 5 10	25							W				No return
S6	14	5 9 50/5	27							W				Driller noted bedrock at 27.5 feet
			28	POORLY GRADED SAND, very fine, white, with pieces of competent rock, (weatherd sandstone bedrock).	SP									Switched to air rotary drilling at 28 feet
			29	LIMESTONE, gray with fine, light gray to white sandstone, (bedrock).										
			31	POORLY GRADED SAND, fine to medium, brown, with trace brown limestone, (bedrock).										
			32											
			34		SP									
			37	LIMESTONE, gray, with fine to medium brownish gray sandstone, (bedrock).										
			38											
			39											
			40											

Boring Number **MW-311A** Use only as an attachment to Form 4400-122. Page **3** of **3**

Sample		Blow Counts	Depth In Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	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	
			41 42 43 44 45 46											
			46	End of boring at 46 feet below ground surface.										





IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-301

Dates Started: 11/10/15 Date Completed: 11/10/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SE of Parcel 003052640340000</u> Distance & direction along boundary: <u>106' W</u> Distance & direction from boundary to wall: <u>306' N</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>684.28</u> Top of protective casing: <u>687.12</u> Top of well casing: _____ <u>686.63</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>15 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 40</u> Length of casing: _____ <u>4 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010"</u> Screen length: _____ <u>10 ft</u> Depth of well: _____ <u>14 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>4 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8 inch bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>8 cu. ft.</u> Backfill (if different from seal): _____ Material: _____ Placement method: _____ Volume: _____ Surface seal design: _____ Material of protective casing: <u>Steel 6 inch</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>3.09 ft</u>	Stabilization Time: <u>&lt;5 minutes</u>
Well development method: <u>Surged with block and pumped to reduce turbidity. 435 gallons pumped.</u>	
Average depth of frostline: <u>3.5'</u>	

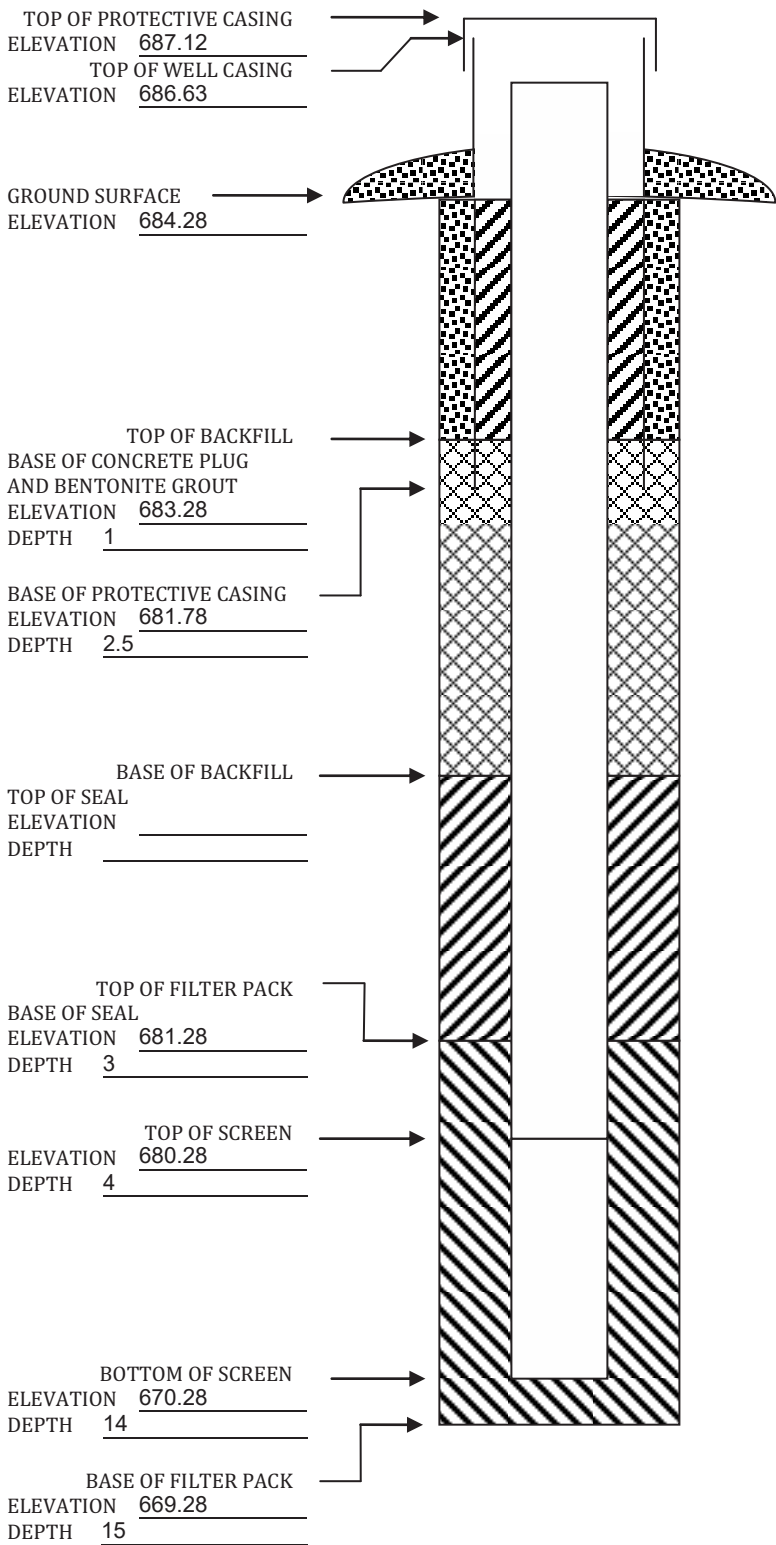
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)





IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-302

Dates Started: 11/10/15 Date Completed: 11/11/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>NW of Parcel 003052630215000</u> Distance & direction along boundary: <u>844' NE</u> Distance & direction from boundary to wall: <u>4.5' S</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>671.55</u> Top of protective casing: <u>674.39</u> Top of well casing: _____ <u>673.90</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>24 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 40</u> Length of casing: _____ <u>13 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>10 ft</u> Depth of well: _____ <u>23 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>3.5 cu. ft</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>2.6 cu. ft</u> Backfill (if different from seal): _____ Material: <u>3/8" bentonite chips</u> Placement method: <u>Gravity</u> Volume: <u>1 cu. ft.</u> Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>18.19</u> Well development method: <u>Surged with block and pumped to remove turbidity. 183 gallons purged</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>&lt; 5 min</u>

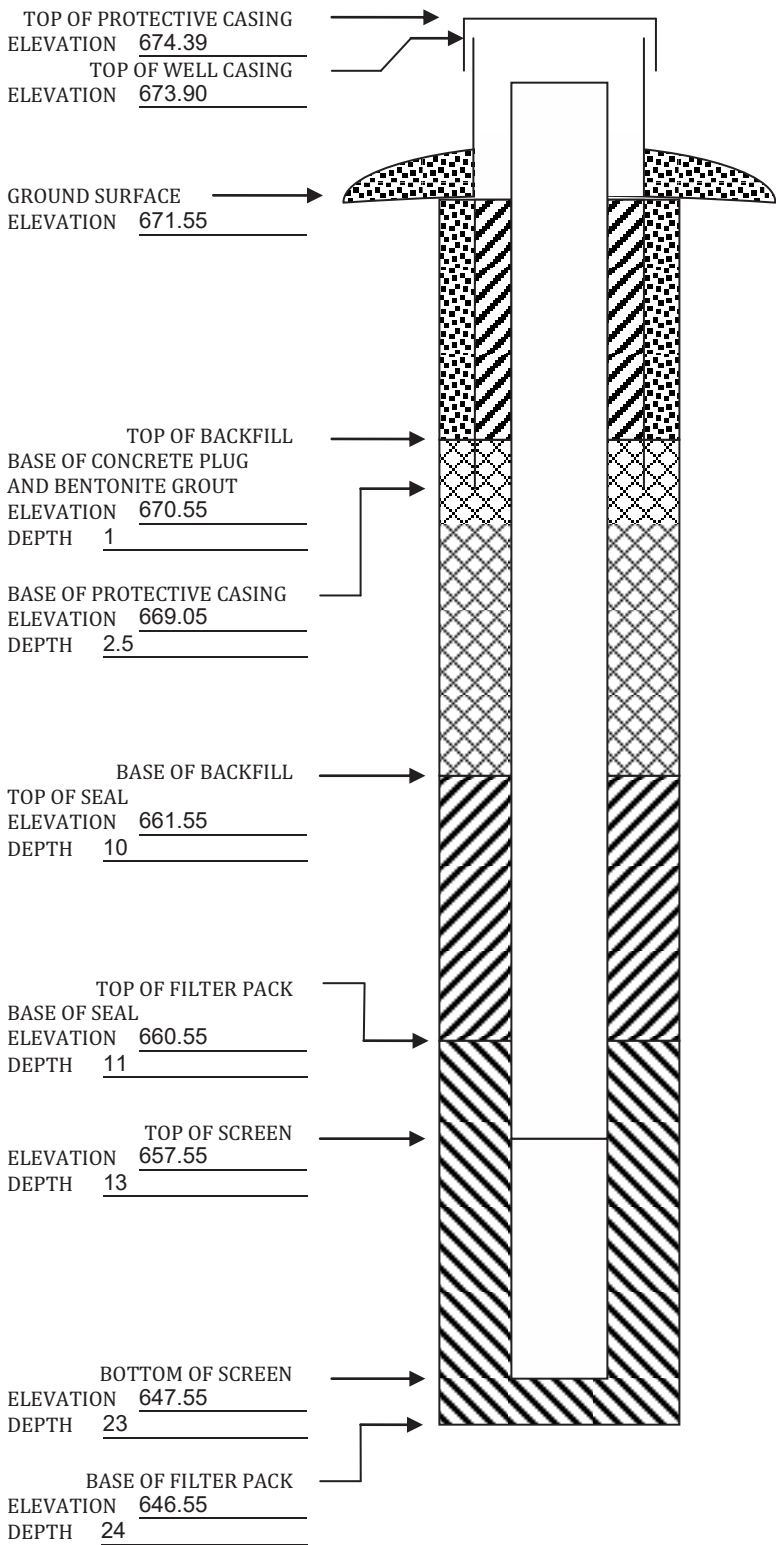
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)





IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-303

Dates Started: 12/8/15 Date Completed: 12/8/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SE of parcel 003052630207000</u> Distance & direction along boundary: <u>181' NW</u> Distance & direction from boundary to wall: <u>0</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>658.95</u> Top of protective casing: <u>661.67</u> Top of well casing: _____ <u>661.07</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>14.5 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u> Length of casing: _____ <u>3 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>10 ft</u> Depth of well: _____ <u>14 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>7.5 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>10 cu. ft.</u> Backfill (if different from seal): _____ Material: _____ Placement method: _____ Volume: _____ Surface seal design: _____ Material of protective casing: <u>Steel 6 inch</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>7.71'</u> Well development method: <u>Bailed dry 3 times to reduce turbidity</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>~ 1 day (bails dry)</u>

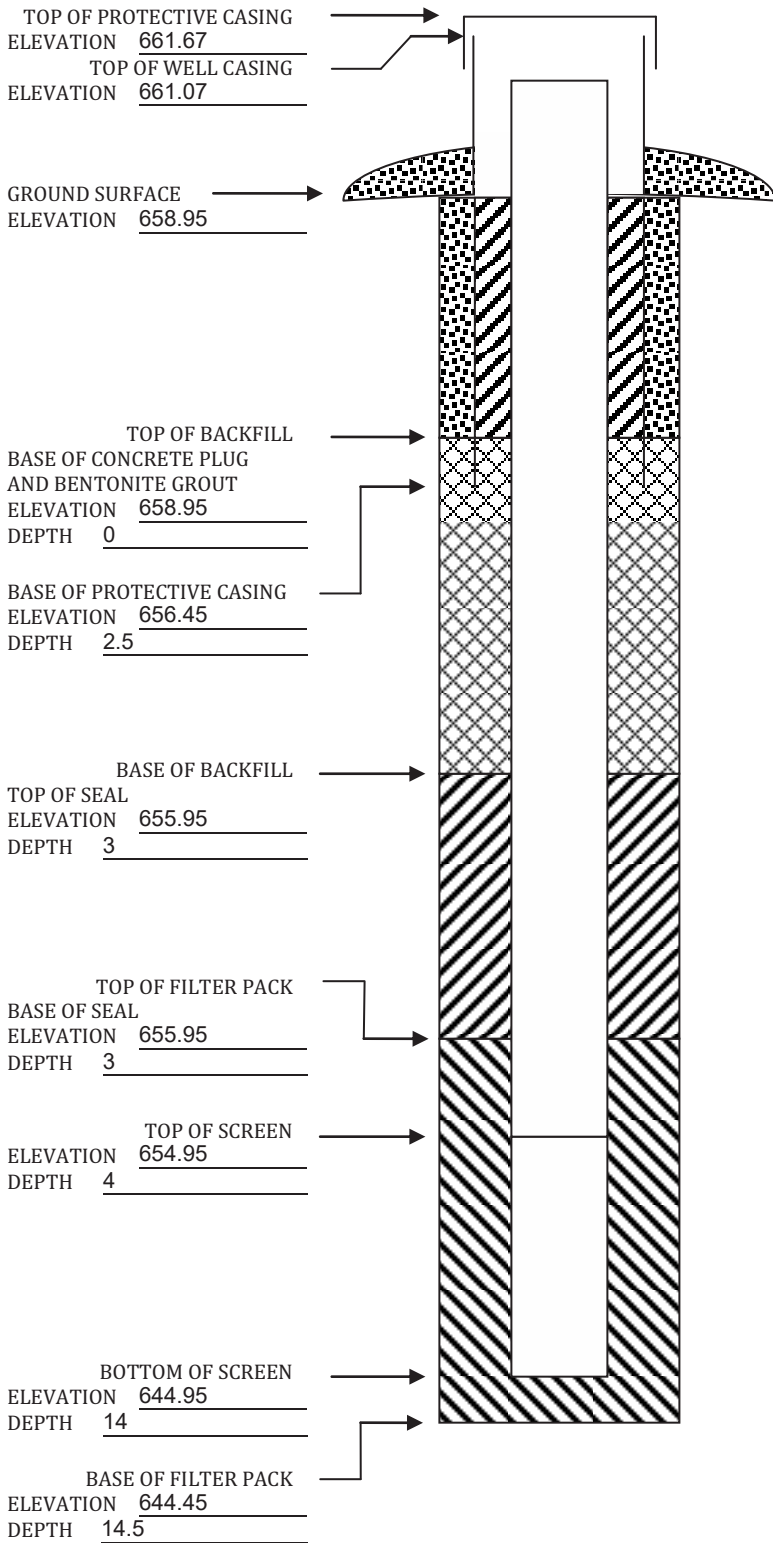
**Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)





IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-304

Dates Started: 11/11/15 Date Completed: 11/12/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft):	Name & Address of Construction Company:
Specify corner of site: <u>SE of Parcel 003052620200000</u>	<u>Cascade Drilling, LP</u>
Distance & direction along boundary: <u>502' W</u>	<u>301 Alderson St</u>
Distance & direction from boundary to wall: <u>44' N</u>	<u>Schofield, WI 54476</u>
Elevations ( $\pm 0.01$ ft MSL):	Name of Driller: <u>Todd Schmalfeld</u>
Ground Surface: <u>680.09</u>	Drilling Method: <u>HSA</u>
Top of protective casing: <u>683.36</u>	Drilling Fluid: <u>NA</u>
Top of well casing: _____ <u>682.84</u>	Bore Hole Diameter: <u>8 inch</u>
Benchmark elevation: _____	Soil Sampling Method: <u>Spoon</u>
Benchmark description: _____	Depth of Boring: <u>52 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material:	<u>PVC sch 40</u>
Length of casing: _____	<u>40 ft</u>
Outside casing diameter:	<u>2.38"</u>
Inside casing diameter: _____	<u>2"</u>
Casing joint type: _____	<u>threaded</u>
Casing/screen joint type: <u>threaded</u>	
Screen material:	<u>PVC</u>
Screen opening size: <u>0.010"</u>	
Screen length: _____	<u>5 ft</u>
Depth of well: _____	<u>50 ft</u>
Filter Pack:	
Material: _____	<u>Red Flint</u>
Grain size: _____	<u>#40</u>
Volume: _____	<u>2 cu. ft.</u>
Seal (minimum 3 ft length above filter pack):	
Material: <u>3/8" bentonite chips</u>	
Placement method:	<u>gravity</u>
Volume: _____	<u>.3 cu. ft.</u>
Backfill (if different from seal):	
Material: <u>AquaGuard Grout</u>	
Placement method: <u>tremie</u>	
Volume: <u>75 gallons</u>	
Surface seal design:	
Material of protective casing: <u>Steel</u>	
Material of grout between protective casing and well casing: <u>sand</u>	
Protective cap:	
Material: <u>Steel, vented</u>	
Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No	Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Well Cap:	
Material: <u>PVC</u>	
Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>24.5 ft</u>	Stabilization Time: <u>~1 day (bails dry)</u>
Well development method: <u>bailed dry 3 times to reduce turbidity</u>	
Average depth of frostline: <u>3.5'</u>	

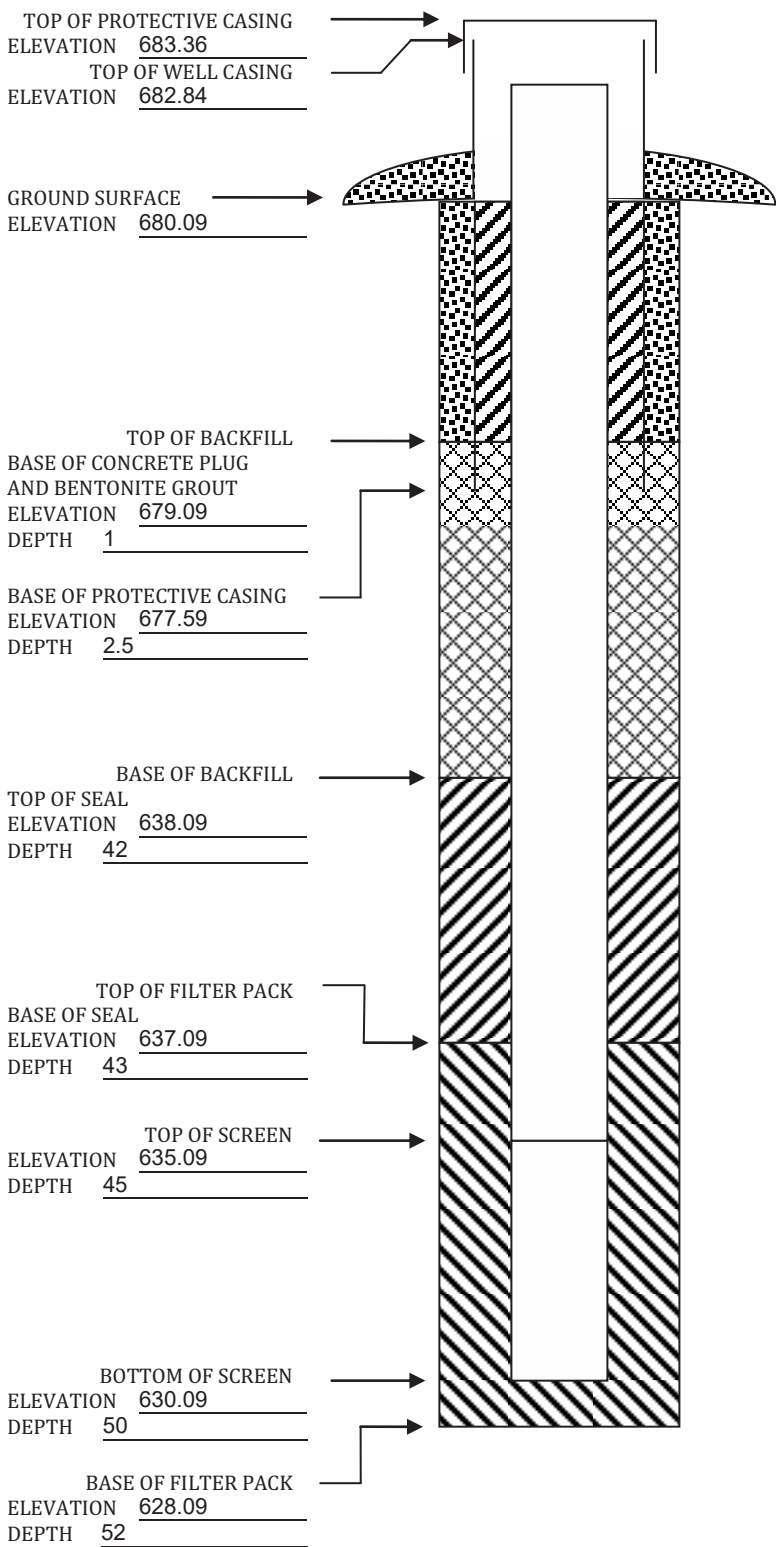
**Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)







IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-305

Dates Started: 12/7/15 Date Completed: 12/8/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>SW of Parcel 003052620200000</u> Distance & direction along boundary: <u>539' E</u> Distance & direction from boundary to wall: <u>404' N</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>681.54</u> Top of protective casing: <u>684.53</u> Top of well casing: _____ <u>683.91</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: _____ <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>50 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u> Length of casing: _____ <u>44 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010</u> Screen length: _____ <u>5 ft</u> Depth of well: _____ <u>49 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>2 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>gravity</u> Volume: <u>.3 cu. ft.</u> Backfill (if different from seal): _____ Material: <u>AquaGuard grou</u> Placement method: <u>tremie</u> Volume: <u>80 gallons</u> Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>22.02</u> Well development method: <u>Surged with block and pumped to reduce turbidity</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>&lt; 5 min</u>

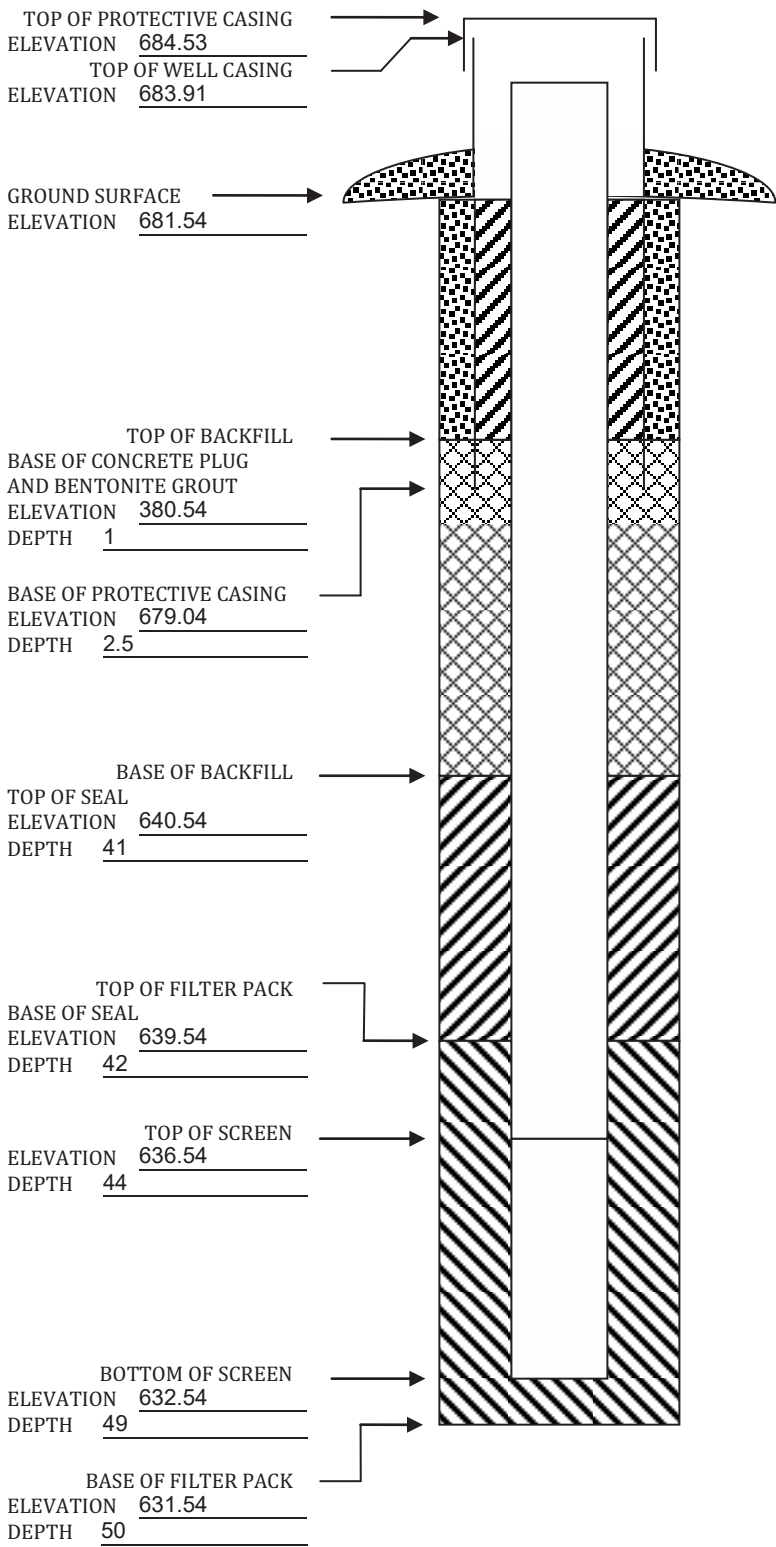
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
 DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
 (SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)





IOWA DEPARTMENT OF NATURAL RESOURCES  
**MONITORING WELL/PIEZOMETER CONSTRUCTION DOCUMENTATION FORM**

Disposal Site Name: IPL - Ottumwa Generating Station Permit No.: \_\_\_\_\_

Well or Piezometer No: MW-306

Dates Started: 11/12/15 Date Completed: 11/12/15

A. SURVEYED LOCATIONS AND ELEVATIONS	B. SOIL BORING INFORMATION
Locations ( $\pm 0.5$ ft): _____ Specify corner of site: <u>NW of Parcel 003052620200000</u> Distance & direction along boundary: <u>137.5' E</u> Distance & direction from boundary to wall: <u>321' S</u> Elevations ( $\pm 0.01$ ft MSL): _____ Ground Surface: <u>681.05</u> Top of protective casing: <u>683.98</u> Top of well casing: _____ <u>683.47</u> Benchmark elevation: _____ Benchmark description: _____	Name & Address of Construction Company: <u>Cascade Drilling, LP</u> <u>301 Alderson St</u> <u>Schofield, WI 54476</u> Name of Driller: <u>Todd Schmalfeld</u> Drilling Method: <u>HSA</u> Drilling Fluid: <u>NA</u> Bore Hole Diameter: <u>8 inch</u> Soil Sampling Method: <u>Spoon</u> Depth of Boring: <u>34.5 ft</u>

C. MONITORING WELL INSTALLATION	
Casing material: _____ <u>PVC sch 80</u> Length of casing: _____ <u>29 ft</u> Outside casing diameter: _____ <u>2.38"</u> Inside casing diameter: _____ <u>2"</u> Casing joint type: _____ <u>threaded</u> Casing/screen joint type: <u>threaded</u> Screen material: _____ <u>PVC</u> Screen opening size: <u>0.010"</u> Screen length: _____ <u>5 ft</u> Depth of well: _____ <u>34 ft</u> Filter Pack: _____ Material: _____ <u>Red Flint</u> Grain size: _____ <u>#40</u> Volume: _____ <u>2 cu. ft.</u> Seal (minimum 3 ft length above filter pack): _____ Material: <u>3/8" bentonite chips</u>	Placement method: <u>Gravity</u> Volume: <u>10.5 cu. ft.</u> Backfill (if different from seal): _____ Material: _____ Placement method: _____ Volume: _____ Surface seal design: _____ Material of protective casing: <u>Steel</u> Material of grout between protective casing and well casing: <u>sand</u> Protective cap: _____ Material: <u>Steel, vented</u> Vented: <input type="checkbox"/> Yes <input type="checkbox"/> No      Locking: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Well Cap: _____ Material: <u>PVC</u> Vented: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ ft below top of inner well casing)	
Water level: <u>12.96'</u> Well development method: <u>Surged with block and pumped. 193 gallons purged.</u> Average depth of frostline: <u>3.5'</u>	Stabilization Time: <u>&lt; 5 min</u>

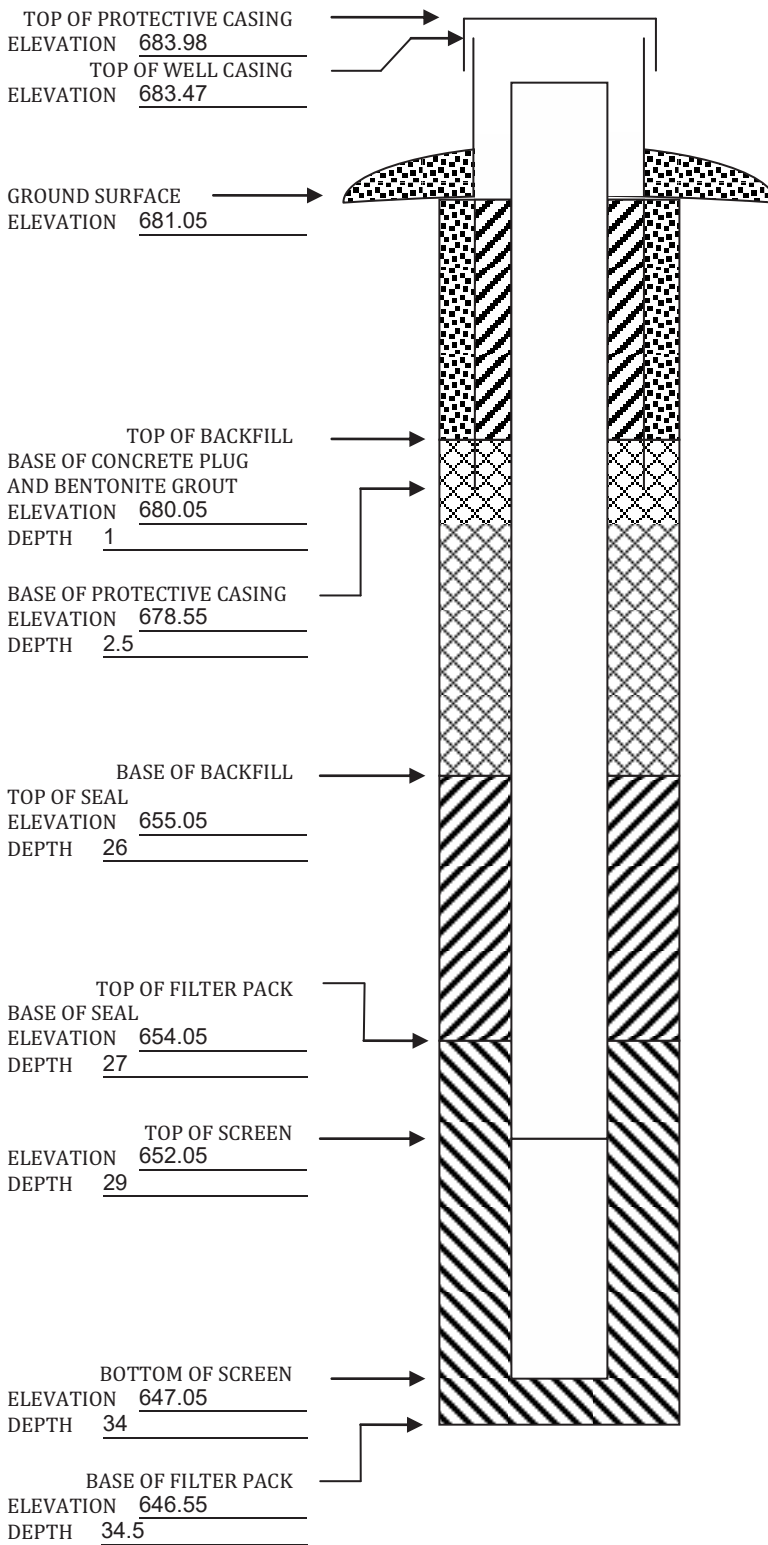
**Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2x11 inch map showing locations of all monitoring wells and piezometers.**

**Please mail completed for to:** Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9<sup>th</sup> St, Des Moines IA 50319-0034.

**Questions? Call or Email:** Nina Koger, Environmental Engineer Sr., 515-281-8986, [Nina.Koger@dnr.iowa.gov](mailto:Nina.Koger@dnr.iowa.gov)

ELEVATIONS: ± 0.01 ft MSL  
DEPTHS: ± 0.1 ft FROM GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
(SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL.)



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL - Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-310 Dates Started 8/27/2019 Date Completed 8/27/2019

## A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site Middle Avery Creek @  
Des Moines River Distance and direction along boundary 340' NW  
Distance and direction from boundary to surface monitoring well 45' SW  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 655.76 Top of protective casing 658.97  
Top of well casing 658.63 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Drilling Inc.  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL, 62260  
Name of driller Eric Wetzel  
Drilling method 4 1/4" HSA Drilling fluid \_\_\_\_\_ Bore Hole diameter 8.5"  
Soil sampling method Split Spoon Depth of boring 24'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC - Sch. 40</u>	Placement method <u>Gravity</u>
Length of casing <u>20.87</u>	Volume <u>4 cubic feet</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.0"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>PVC - Sch. 40</u>	Surface seal design: <u>Concrete</u>
Screen opening size <u>0.01'</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Bentonite/Filter Sand</u>
Depth of Well <u>23'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter Sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#5</u>	Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Volume <u>1.25 cubic feet</u>	Well cap: _____
Seal (minimum 3 ft. length above filter pack): _____	Material <u>Plastic</u>
Material <u>3/8" Bentonite Chips</u>	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N

## D. GROUNDWATER MEASUREMENT ( $\pm 0.01$ foot below top of inner well casing)

Water level 16.67 Stabilization time 5 min  
Well development method surge and purge with pump to remove turbidity  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature [Signature] Certification # 11509 Date 10.3.19

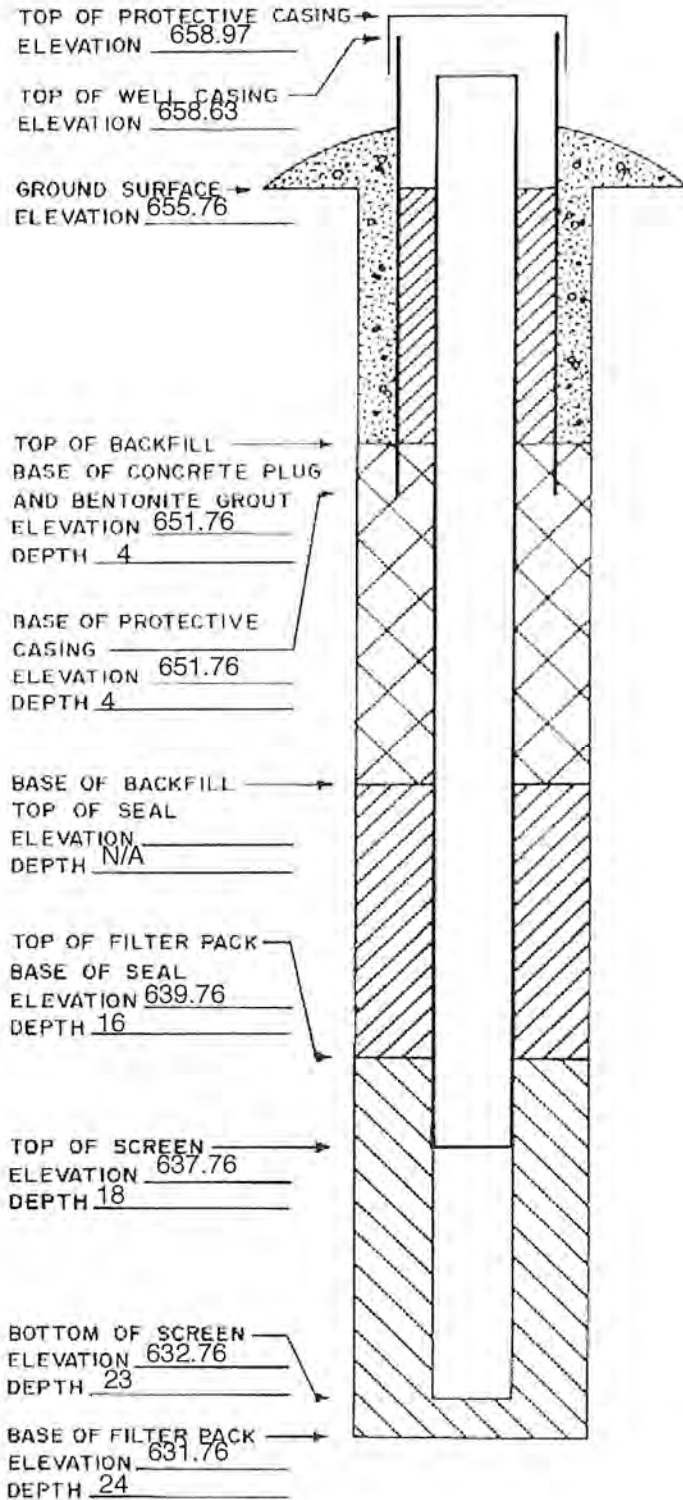
Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

ELEVATIONS: ± 0.01 FT. MSL  
DEPTHS: ± 0.1 FT. FROM  
GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
( SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL )



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL - Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-311 Dates Started 8/27/2019 Date Completed 8/27/2019

## A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site SE Distance and direction along boundary 730' W  
Distance and direction from boundary to surface monitoring well 160' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 651.24 Top of protective casing 654.49  
Top of well casing 654.18 Benchmark elevation \_\_\_\_\_  
Benchmark description \_\_\_\_\_

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Drilling Inc.  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL, 62260  
Name of driller Eric Wetzel  
Drilling method 4 1/4" HSA Drilling fluid \_\_\_\_\_ Bore Hole diameter 8.5"  
Soil sampling method Split Spoon Depth of boring 16'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC - Sch. 40</u>	Placement method <u>Gravity</u>
Length of casing <u>12.94'</u>	Volume <u>2 cubic feet</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.0"</u>	Material _____
Casing joint type <u>Threaded</u>	Placement method _____
Casing/screen joint type <u>Threaded</u>	Volume _____
Screen material <u>PVC - Sch. 40</u>	Surface seal design: <u>Concrete</u>
Screen opening size <u>0.01'</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Bentonite/Filter Sand</u>
Depth of Well <u>15'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter Sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#5</u>	Well cap: _____
Volume <u>1.5 cubic feet</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>3/8" Bentonite Chips</u>	

## D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level 12.04 Stabilization time 5 min  
Well development method surge and purge with pump to remove turbidity  
Average depth of frost line 3.5'

## DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature [Signature] Certification # 11509 Date 10.3.19

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

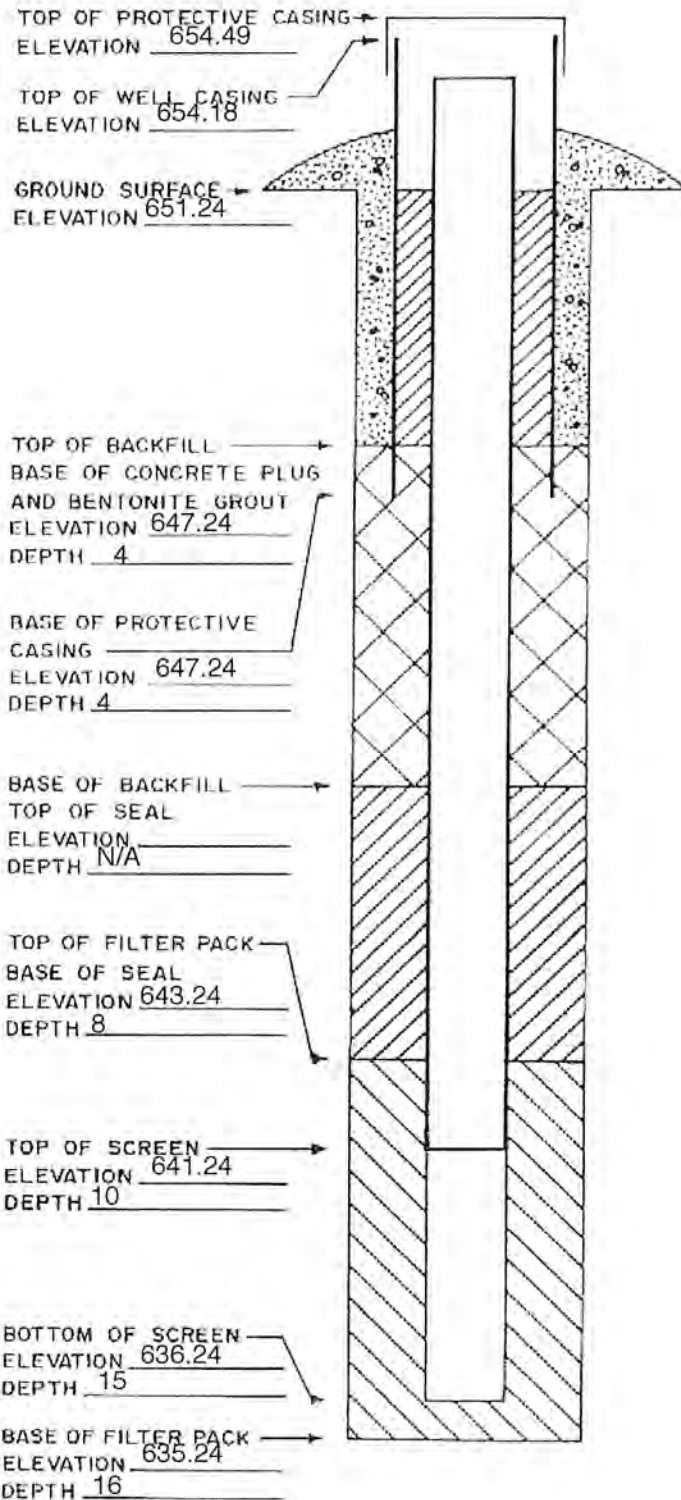
Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

ELEVATIONS: ± 0.01 FT. MSL

DEPTHS: ± 0.1 FT. FROM  
GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
( SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL ).





# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-305A Dates Started 2/25/2020 Date Completed 3/4/2020

## A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site SW of Parcel 00305262020 Distance and direction along boundary 539' E  
Distance and direction from boundary to surface monitoring well 404' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 681.76' Top of protective casing 684.35'  
Top of well casing 684.03' Benchmark elevation 654.48'  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA, 6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 80'

## C. MONITORING WELL INSTALLATION

Casing material PVC-Sch. 80 Placement method Gravity  
Length of casing 82' Volume 2 cu. ft.  
Outside casing diameter 2.4" Backfill (if different from seal): \_\_\_\_\_  
Inside casing diameter 1.9 Material Bentonite grout  
Casing joint type Threaded Placement method pumped  
Casing/screen joint type Threaded Volume 300 gallons  
Screen material PVC-Sch. 80 Surface seal design: \_\_\_\_\_  
Screen opening size 0.01" Material of protective casing: Steel  
Screen length 5' Material of grout between  
Depth of Well 79' protective casing and well casing: Sand  
Filter Pack: \_\_\_\_\_ Protective cap: \_\_\_\_\_  
Material Steel  
Material Filter sand Vented?:  Y  N Locking?:  Y  N  
Grain Size #18 Well cap: \_\_\_\_\_  
Volume 3 bags (50 lbs bags, Sil filter sand) Material Plastic  
Seal (minimum 3 ft. length above filter pack): \_\_\_\_\_ Vented?:  Y  N  
Material 3/8" Bentonite chips

## D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level 32.7' Stabilization time ~ 1 day  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature Jeff Crank Certification # 8515 Date 9-16-20

Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

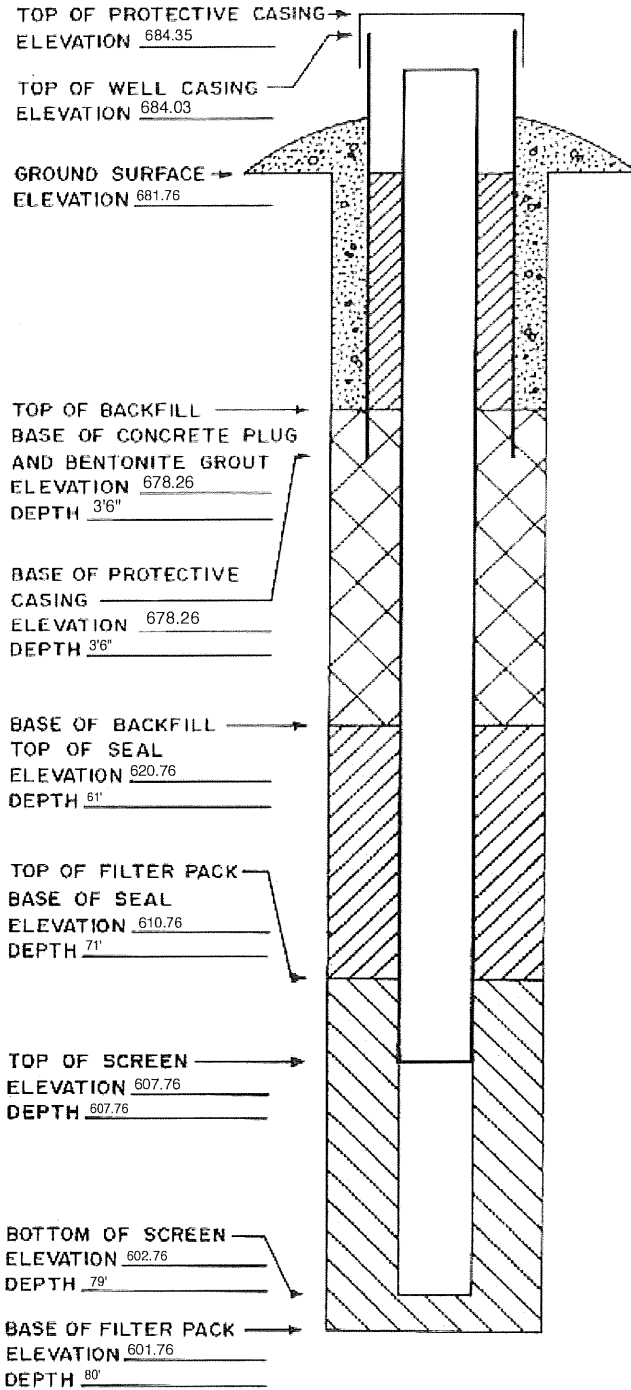
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL  
DEPTHS: ± 0.1 FT. FROM  
GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
( SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL ).



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-310A Dates Started 2/27/2020 Date Completed 3/4/2020

## A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site \_\_\_\_\_ Distance and direction along boundary 340' NW  
Distance and direction from boundary to surface monitoring well 45' SW  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 655.26' Top of protective casing 658.25'  
Top of well casing 657.93' Benchmark elevation 654.48'  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA,6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 54'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC-Sch. 80</u>	Placement method <u>Gravity</u>
Length of casing <u>55.5'</u>	Volume <u>2 cu. ft.</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>1.9"</u>	Material <u>Bentonite grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>200 gallons</u>
Screen material <u>PVC-Sch. 80</u>	Surface seal design: _____
Screen opening size <u>0.1</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>53'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#18</u>	Well cap: _____
Volume <u>3 bags (50 lbs bags, Sil filter sand)</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>3/8" Bentonite chips</u>	

## D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level 12' Stabilization time ~ 1 week  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

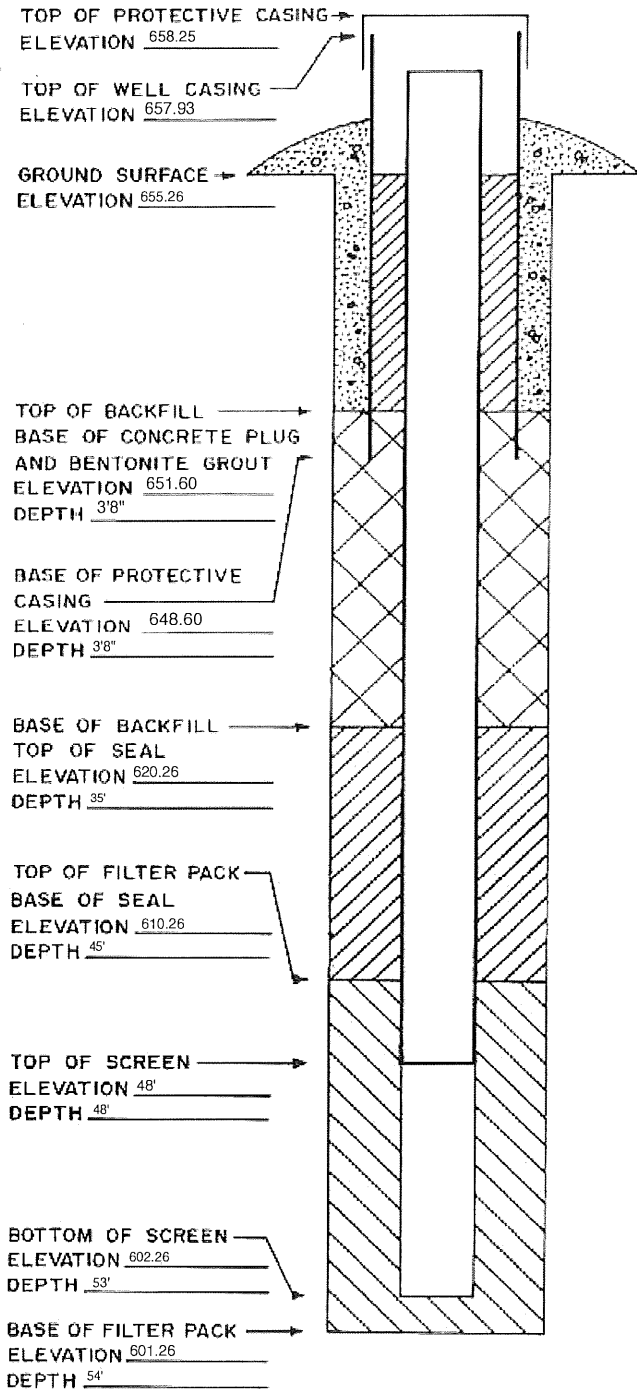
Signature Jeff Crank Certification # 8515 Date 9-16-20

Attachments: Driller's log. Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.  
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

ELEVATIONS: ± 0.01 FT. MSL  
DEPTHS: ± 0.1 FT. FROM  
GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
( SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL ).



# MONITORING WELL / PIEZOMETER CONSTRUCTION DOCUMENTATION FORM

Disposal Site Name IPL-Ottumwa Generating Station Permit No. \_\_\_\_\_  
Well or Piezometer No. MW-311A Dates Started 3/2/2020 Date Completed 3/4/2020

## A. SURVEYED LOCATION AND ELEVATION OF POINT (+0.5 ft.)

Specify corner of site SE Distance and direction along boundary 730' W  
Distance and direction from boundary to surface monitoring well 160' N  
Elevation (+0.01 ft. MSL) \_\_\_\_\_  
Ground Surface 651.16' Top of protective casing 653.88  
Top of well casing 653.54' Benchmark elevation 654.48  
Benchmark description Intake Structure Mag-Nail

## B. SOIL BORING INFORMATION

Construction Company Name Roberts Environmental Services  
Address 1107 South Mulberry Street City, State, Zip Code Millstadt, IL 62260  
Name of driller Jeff Crank  
Drilling method 6 1/4" HSA, 6" Air Rotary Drilling fluid \_\_\_\_\_ Bore Hole diameter 10"/6"  
Soil sampling method Split spoon/Sample catch from augers Depth of boring 46'

## C. MONITORING WELL INSTALLATION

Casing material <u>PVC-Sch. 40</u>	Placement method <u>Gravity</u>
Length of casing <u>47.68'</u>	Volume <u>2 cu. ft.</u>
Outside casing diameter <u>2.4"</u>	Backfill (if different from seal): _____
Inside casing diameter <u>2.1"</u>	Material <u>Bentonite grout</u>
Casing joint type <u>Threaded</u>	Placement method <u>pumped</u>
Casing/screen joint type <u>Threaded</u>	Volume <u>200 gallons</u>
Screen material <u>PVC-Sch. 40</u>	Surface seal design: _____
Screen opening size <u>0.1</u>	Material of protective casing: <u>Steel</u>
Screen length <u>5'</u>	Material of grout between protective casing and well casing: <u>Sand</u>
Depth of Well <u>45'</u>	Protective cap: _____
Filter Pack: _____	Material <u>Steel</u>
Material <u>Filter sand</u>	Vented?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N Locking?: <input checked="" type="checkbox"/> Y <input type="checkbox"/> N
Grain Size <u>#18</u>	Well cap: _____
Volume <u>3 bags (50 lbs bags, Sil filter sand)</u>	Material <u>Plastic</u>
Seal (minimum 3 ft. length above filter pack): _____	Vented?: <input type="checkbox"/> Y <input checked="" type="checkbox"/> N
Material <u>3/8" Bentonite chips</u>	

## D. GROUNDWATER MEASUREMENT (+0.01 foot below top of inner well casing)

Water level 8.89' Stabilization time ~ 1 week  
Well development method Pump and surge  
Average depth of frost line 40"

## DRILLER'S CERTIFICATION

I certify under penalty of law I believe the information reported above is true, accurate, and complete.

Signature *Jeff Crank* Certification # 8515 Date 9-16-20

Attachments: Driller's log, Pipe schedules and grouting schedules. 8 1/2 inch x 11 inch map showing locations of all monitoring wells and piezometers.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E. 9<sup>th</sup> St, Des Moines, IA 50319.

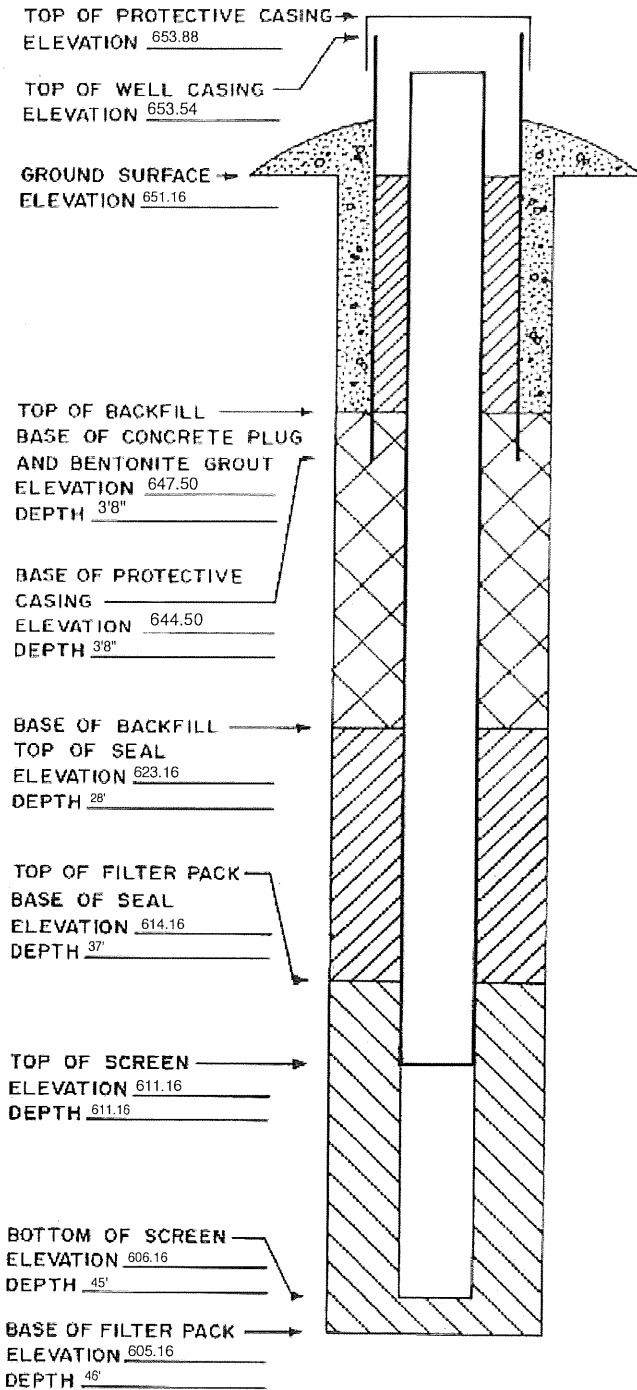
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, [nina.booker@dnr.iowa.gov](mailto:nina.booker@dnr.iowa.gov)

09/2017 cmc

DNR Form 542-1277

ELEVATIONS: ± 0.01 FT. MSL  
DEPTHS: ± 0.1 FT. FROM  
GROUND SURFACE

SPACE TO ATTACH ENTIRE SOIL BORING LOG  
( SHOW SCREENED INTERVAL AND FILTER PACK INTERVAL ).



# Appendix C

## Laboratory Reports

## C1 Assessment Monitoring February 2020



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175270-2


Laboratory Sample Delivery Group: MW-301 Rad

Client Project/Site: Ottumwa Generating Station 25219072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:

3/4/2020 11:01:35 AM

Jim Knapp, Project Manager II  
(630)758-0262

[jim.knapp@testamericainc.com](mailto:jim.knapp@testamericainc.com)

Designee for

Sandie Fredrick, Project Manager II  
(920)261-1660

[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:

[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175270-1	MW-301	Water	02/05/20 09:45	02/06/20 18:40	

---

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

**Client Sample ID: MW-301**

**Lab Sample ID: 310-175270-1**

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
 SDG: MW-301 Rad

**Client Sample ID: MW-301**

**Lab Sample ID: 310-175270-1**

Date Collected: 02/05/20 09:45

Matrix: Water

Date Received: 02/06/20 18:40

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0490	U	0.0730	0.0731	1.00	0.124	pCi/L	02/10/20 12:07	03/03/20 11:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.4		40 - 110					02/10/20 12:07	03/03/20 11:59	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.179	U	0.273	0.274	1.00	0.459	pCi/L	02/10/20 12:27	02/18/20 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.4		40 - 110					02/10/20 12:27	02/18/20 17:26	1
Y Carrier	87.5		40 - 110					02/10/20 12:27	02/18/20 17:26	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.228	U	0.283	0.284	5.00	0.459	pCi/L		03/04/20 08:50	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
 SDG: MW-301 Rad

## Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-459800/21-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	-0.007253	U	0.0361	0.0361	1.00	0.0814	pCi/L	02/10/20 12:07	03/03/20 11:59	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	103		40 - 110		02/10/20 12:07	03/03/20 11:59	1			

Lab Sample ID: LCS 160-459800/1-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	8.658		0.901	1.00	0.111	pCi/L	76	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	110		40 - 110						

Lab Sample ID: LCSD 160-459800/2-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	9.170		0.952	1.00	0.0937	pCi/L	81	75 - 125	0.28	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	103		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-459801/21-A  
 Matrix: Water  
 Analysis Batch: 460917

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459801

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	-0.07100	U	0.183	0.183	1.00	0.346	pCi/L	02/10/20 12:27	02/18/20 17:26	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	103		40 - 110		02/10/20 12:27	02/18/20 17:26	1			
Y Carrier	87.9		40 - 110		02/10/20 12:27	02/18/20 17:26	1			

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
 SDG: MW-301 Rad

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-459801/1-A**  
**Matrix: Water**  
**Analysis Batch: 460918**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 459801**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-228	9.10	7.798		0.934	1.00	0.384	pCi/L	86	75 - 125	
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
Ba Carrier	110		40 - 110							
Y Carrier	87.1		40 - 110							

**Lab Sample ID: LCSD 160-459801/2-A**  
**Matrix: Water**  
**Analysis Batch: 460918**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 459801**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.10	8.440		1.01	1.00	0.396	pCi/L	93	75 - 125	0.33	1
<b>Carrier</b>	<b>LCSD %Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	103		40 - 110								
Y Carrier	87.1		40 - 110								



# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

## Rad

### Prep Batch: 459800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	PrecSep-21	
MB 160-459800/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-459800/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-459800/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 459801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	PrecSep_0	
MB 160-459801/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-459801/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-459801/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

**Client Sample ID: MW-301**

**Lab Sample ID: 310-175270-1**

**Date Collected: 02/05/20 09:45**

**Matrix: Water**

**Date Received: 02/06/20 18:40**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			459800	02/10/20 12:07	MNH	TAL SL
Total/NA	Analysis	903.0		1	462625	03/03/20 11:59	AJD	TAL SL
Total/NA	Prep	PrecSep_0			459801	02/10/20 12:27	MNH	TAL SL
Total/NA	Analysis	904.0		1	460917	02/18/20 17:26	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	463040	03/04/20 08:50	SMP	TAL SL

**Laboratory References:**

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
 SDG: MW-301 Rad

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20 *
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Pos			
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

**Protocol References:**

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

**Laboratory References:**

- TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566





**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u> STATE <u>MN</u>	Project: <u>Ottumwa</u>	
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u> TIME <u>1840</u>	Received By: <u>LAB</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.4</u>	Corrected Temp (°C): <u>2.5</u>	
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

<b>Client Information</b>		Sampler: <i>Cause Jennings</i>		Lab PM: Fredrick, Sandie		Carrier Tracking No(s):		COC No: 310-47095-14655.1					
Client Contact: Louise Jennings		Phone: <i>608-509-5445</i>		E-Mail: sandie.fredrick@testamericainc.com				Page: Page 1 of 1					
Company: SCS Engineers								Job #:					
Address: 8450 Hickman Road, Suite 20		Due Date Requested:		Analysis Requested				Preservation Codes:					
City: Clive		TAT Requested (days):		Perform MSMSD (Yes or No)				A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:					
State, Zip: IA, 50325		PO #: 25219072		Field Filtered Sample (Yes or No)				M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)					
Phone:		WO #:		903.0.904.0				Total Number of Containers					
Email: ljennings@scsengineers.com		Project #:		903.0.904.0									
Project Name: Ottumwa Generating Station 25219072		SSOW#:		2540C_Calcd, 9056A_ORGFM_28D, SM4500_H+									
Site:				D		D		N					
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, A=air)	Preservation Code:	Field Filtered Sample (Yes or No)	Perform MSMSD (Yes or No)	903.0.904.0	6020A, 7470A	2540C_Calcd, 9056A_ORGFM_28D, SM4500_H+	Analysis Requested	Carrier Tracking No(s)	COC No
MW-301	2/5/20	0945	G	Water				X	X				
MW-309	I	1100	G	Water				X	X				
MW-311	I	0850	G	Water				X	X				
Field Blank		2359	G	Water				X	X				
				Water									
				Water									
				Water									
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p> <p>Deliverable Requested: I, II, III, IV, Other (specify)</p> <p><b>Empty Kit Relinquished by:</b> <i>Jennings</i> Date: 2/5/20 500pm Company: SCS</p> <p>Relinquished by: <i>Jennings</i> Date/Time: 2/5/20 500pm Company: SCS</p> <p>Relinquished by: Date/Time: Company:</p> <p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.:</p>													
<p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months</p> <p>Special Instructions/QC Requirements:</p> <p>Received by: <i>Sunday Bunker</i> Date/Time: 2-6-20 1840 Company:</p> <p>Received by: Date/Time: Company:</p> <p>Received by: Date/Time: Company:</p> <p>Cooler Temperature(s) °C and Other Remarks:</p>													

1  
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Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-175270-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309
<b>Appendix III Parameters</b>													
Boron	x	x						x	x	x	x	x	7
Calcium	x	x						x	x	x	x	x	7
Chloride	x	x						x	x	x	x	x	7
Fluoride								x	x				2
pH	x	x						x	x	x	x	x	7
Sulfate	x	x						x	x	x	x	x	7
TDS	x	x						x	x	x	x	x	7
<b>Appendix IV Parameters</b>													
Antimony								x	x				2
Arsenic	x	x						x	x	x	x	x	7
Barium	x	x						x	x	x	x	x	7
Beryllium								x	x				2
Cadmium	x	x						x	x	x	x	x	7
Chromium	x	x						x	x	x	x	x	7
Cobalt	x	x						x	x	x	x	x	7
Fluoride								x	x				2
Lead	x	x						x	x	x	x	x	7
Lithium	x	x						x	x	x	x	x	7
Mercury								x	x				2
Molybdenum								x	x				2
Selenium								x	x				2
Thallium								x	x				2
Radium	x	x						x	x	x	x	x	7
<b>Field Parameters</b>													
Groundwater Elevation	x							x	x	x	x	x	6
Well Depth	x							x	x	x	x	x	6
pH (field)	x							x	x	x	x	x	6
Specific Conductance	x							x	x	x	x	x	6
Dissolved Oxygen	x							x	x	x	x	x	6
ORP	x							x	x	x	x	x	6
Temperature	x							x	x	x	x	x	6
Turbidity	x							x	x	x	x	x	6
Color	x							x	x	x	x	x	6
Odor	x							x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1



## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-2

SDG Number: MW-301 Rad

**Login Number: 175270**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Field Blank 250 HNO3 has MW-301, time matches FB with 2359, lid marked FB.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-2

SDG Number: MW-301 Rad

**Login Number: 175270**

**List Number: 2**

**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 02/08/20 10:20 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	21.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-2  
SDG: MW-301 Rad

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
310-175270-1	MW-301	95.4	
LCS 160-459800/1-A	Lab Control Sample	110	
LCSD 160-459800/2-A	Lab Control Sample Dup	103	
MB 160-459800/21-A	Method Blank	103	

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
310-175270-1	MW-301	95.4	87.5
LCS 160-459801/1-A	Lab Control Sample	110	87.1
LCSD 160-459801/2-A	Lab Control Sample Dup	103	87.1
MB 160-459801/21-A	Method Blank	103	87.9

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier  
Y Carrier = Y Carrier

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175270-7  
Laboratory Sample Delivery Group: MW-311  
Client Project/Site: Ottumwa Generating Station 25219072

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
2/18/2020 12:12:23 PM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

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**Job ID: 310-175270-7**

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**Laboratory: Eurofins TestAmerica, Cedar Falls**

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## Narrative

**Job Narrative**  
**310-175270-7**

### Comments

No additional comments.

### Receipt

The samples were received on 2/6/2020 6:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

### HPLC/IC

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-311 (310-175270-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Metals

Methods 245.2, 7470A: The matrix spike / matrix spike duplicate / sample duplicate (MS/MSD/DUP) precision for preparation batch 310-269798 and analytical batch 310-269985 was outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory control sample duplicate (LCS/LCSD) precision was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175270-3	MW-311	Water	02/05/20 08:50	02/06/20 18:40	

---

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
 SDG: MW-311

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	54		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	160		2.0	0.90	ug/L	1		6020A	Total/NA
Calcium	130		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.11	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	2.9	J	10	2.3	ug/L	1		6020A	Total/NA
Selenium	1.2	J	5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	520		30	26	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	645.00				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	21				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	2.11				mg/L	1		Field Sampling	Total/NA
pH, Field	6.72				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	891				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	10.21				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.89				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls





# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

Date Collected: 02/05/20 08:50

Matrix: Water

Date Received: 02/06/20 18:40

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>14</b>		5.0	2.0	mg/L			02/11/20 00:10	5
Fluoride	<0.23		0.50	0.23	mg/L			02/11/20 00:10	5
<b>Sulfate</b>	<b>54</b>		5.0	3.6	mg/L			02/11/20 00:10	5

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		02/10/20 08:15	02/11/20 19:14	1
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 19:14	1
<b>Barium</b>	<b>160</b>		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 19:14	1
Beryllium	<0.27		1.0	0.27	ug/L		02/10/20 08:15	02/11/20 19:14	1
Boron	<100		200	100	ug/L		02/10/20 08:15	02/11/20 19:14	1
Cadmium	<0.039		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 19:14	1
<b>Calcium</b>	<b>130</b>		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 19:14	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 19:14	1
<b>Cobalt</b>	<b>0.11</b>	<b>J</b>	0.50	0.091	ug/L		02/10/20 08:15	02/11/20 19:14	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 19:14	1
<b>Lithium</b>	<b>2.9</b>	<b>J</b>	10	2.3	ug/L		02/10/20 08:15	02/11/20 19:14	1
Molybdenum	<1.1		2.0	1.1	ug/L		02/10/20 08:15	02/11/20 19:14	1
<b>Selenium</b>	<b>1.2</b>	<b>J</b>	5.0	1.0	ug/L		02/10/20 08:15	02/11/20 19:14	1
Thallium	<0.26		1.0	0.26	ug/L		02/10/20 08:15	02/11/20 19:14	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		02/10/20 10:55	02/11/20 14:09	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>520</b>		30	26	mg/L			02/11/20 10:45	1
<b>pH</b>	<b>7.1</b>	<b>HF</b>	0.1	0.1	SU			02/06/20 22:05	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>645.00</b>				ft			02/05/20 08:50	1
<b>Oxidation Reduction Potential</b>	<b>21</b>				millivolts			02/05/20 08:50	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>2.11</b>				mg/L			02/05/20 08:50	1
<b>pH, Field</b>	<b>6.72</b>				SU			02/05/20 08:50	1
<b>Specific Conductance, Field</b>	<b>891</b>				umhos/cm			02/05/20 08:50	1
<b>Temperature, Field</b>	<b>10.21</b>				Degrees C			02/05/20 08:50	1
<b>Turbidity, Field</b>	<b>1.89</b>				NTU			02/05/20 08:50	1

Eurofins TestAmerica, Cedar Falls

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

## Qualifiers

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
 SDG: MW-311

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-270331/3**  
**Matrix: Water**  
**Analysis Batch: 270331**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			02/10/20 17:19	1
Fluoride	<0.046		0.10	0.046	mg/L			02/10/20 17:19	1
Sulfate	<0.71		1.0	0.71	mg/L			02/10/20 17:19	1

**Lab Sample ID: LCS 310-270331/4**  
**Matrix: Water**  
**Analysis Batch: 270331**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.97		mg/L		100	90 - 110
Fluoride	2.00	1.94		mg/L		97	90 - 110
Sulfate	10.0	10.2		mg/L		102	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-269745/1-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		02/10/20 08:15	02/11/20 18:39	1
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 18:39	1
Barium	<0.90		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 18:39	1
Beryllium	<0.27		1.0	0.27	ug/L		02/10/20 08:15	02/11/20 18:39	1
Boron	<100		200	100	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cadmium	<0.039		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 18:39	1
Calcium	<0.19		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 18:39	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cobalt	<0.091		0.50	0.091	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lithium	<2.3		10	2.3	ug/L		02/10/20 08:15	02/11/20 18:39	1
Molybdenum	<1.1		2.0	1.1	ug/L		02/10/20 08:15	02/11/20 18:39	1
Selenium	<1.0		5.0	1.0	ug/L		02/10/20 08:15	02/11/20 18:39	1
Thallium	<0.26		1.0	0.26	ug/L		02/10/20 08:15	02/11/20 18:39	1

**Lab Sample ID: LCS 310-269745/2-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	80.0	66.6		ug/L		83	80 - 120
Barium	80.0	72.9		ug/L		91	80 - 120
Beryllium	40.0	37.9		ug/L		95	80 - 120
Boron	1760	1580		ug/L		90	80 - 120
Cadmium	40.0	36.6		ug/L		91	80 - 120
Calcium	4.00	3.60		mg/L		90	80 - 120
Chromium	80.0	72.3		ug/L		90	80 - 120
Cobalt	40.0	37.0		ug/L		92	80 - 120
Lead	40.0	37.6		ug/L		94	80 - 120

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
 SDG: MW-311

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-269745/2-A  
 Matrix: Water  
 Analysis Batch: 270025

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 269745

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	200	165		ug/L		82	80 - 120
Selenium	80.0	68.1		ug/L		85	80 - 120
Thallium	32.0	28.2		ug/L		88	80 - 120

Lab Sample ID: LCS 310-269745/2-A  
 Matrix: Water  
 Analysis Batch: 270292

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 269745

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	40.0	35.7		ug/L		89	80 - 120
Molybdenum	80.0	75.9		ug/L		95	80 - 120

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-269798/1-A  
 Matrix: Water  
 Analysis Batch: 269985

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 269798

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		02/10/20 10:55	02/11/20 12:38	1

Lab Sample ID: LCS 310-269798/2-A  
 Matrix: Water  
 Analysis Batch: 269985

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 269798

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.76		ug/L		106	80 - 120

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-269931/1  
 Matrix: Water  
 Analysis Batch: 269931

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			02/11/20 10:45	1

Lab Sample ID: LCS 310-269931/2  
 Matrix: Water  
 Analysis Batch: 269931

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	970		mg/L		97	90 - 110

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

## HPLC/IC

### Analysis Batch: 270331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	9056A	
MB 310-270331/3	Method Blank	Total/NA	Water	9056A	
LCS 310-270331/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 269745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	3010A	
MB 310-269745/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Prep Batch: 269798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	7470A	
MB 310-269798/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-269798/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 269985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	7470A	269798
MB 310-269798/1-A	Method Blank	Total/NA	Water	7470A	269798
LCS 310-269798/2-A	Lab Control Sample	Total/NA	Water	7470A	269798

### Analysis Batch: 270025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

### Analysis Batch: 270043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

### Analysis Batch: 270292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

## General Chemistry

### Analysis Batch: 269585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 269931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	SM 2540C	
MB 310-269931/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-269931/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

## Field Service / Mobile Lab

Analysis Batch: 270470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	Field Sampling	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

**Date Collected: 02/05/20 08:50**

**Matrix: Water**

**Date Received: 02/06/20 18:40**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	270331	02/11/20 00:10	ACJ	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270025	02/11/20 19:14	SAD	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270043	02/11/20 19:14	SAD	TAL CF
Total/NA	Prep	7470A			269798	02/10/20 10:55	HIS	TAL CF
Total/NA	Analysis	7470A		1	269985	02/11/20 14:09	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	269931	02/11/20 10:45	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	269585	02/06/20 22:05	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	270470	02/05/20 08:50	EAR	TAL CF

## Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

- 1
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- 14

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.



# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-7  
SDG: MW-311

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u> STATE <u>MN</u>	Project: <u>Ottumwa</u>	
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u> TIME <u>1840</u>	Received By: <u>LAB</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.4</u>	Corrected Temp (°C): <u>2.5</u>	
• Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

**Chain of Custody Record**

<b>Client Information</b>		Sampler: <i>Cause Jennings</i>		Lab PM: Fredrick, Sandie		Carrier Tracking No(s):		COC No: 310-47095-14655.1	
Client Contact: Louise Jennings		Phone: 608-509-5445		E-Mail: sandie.fredrick@testamericainc.com				Page: Page 1 of 1	
Company: SCS Engineers								Job #:	
Address: 8450 Hickman Road, Suite 20		Due Date Requested:		Analysis Requested				Preservation Codes:	
City: Clive		TAT Requested (days):						A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
State, Zip: IA, 50325		PO #: 25219072						M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone:		WO #:						Total Number of containers	
Email: ljennings@scsengineers.com		Project #:						Special Instructions/Note:	
Project Name: Ottumwa Generating Station 25219072		SSOW#:							
Site:									
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, etc)	Field Filtered Sample (Yes or No)	Perform MSMSD (Yes or No)	903.0, 904.0	6020A, 7470A	2540C, Calcd, 9056A_ORGFM_28D, SM4500_H+
MW-301	2/5/20	0945	G	Water	X	X	X	X	
MW-309	I	1100	G	Water	X	X	X	X	
MW-311	I	0850	G	Water	X	X	X	X	
Field Blank		2359	G	Water	X	X	X	X	
				Water					
				Water					
				Water					
				Water					
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p> <p><b>Deliverable Requested:</b> I, II, III, IV, Other (specify)</p> <p><b>Empty Kit Relinquished by:</b> <i>Jennings</i> Date: 2/5/20 500pm Company: SCS</p> <p><b>Relinquished by:</b> <i>Jennings</i> Date/Time: 2/5/20 500pm Company: SCS</p> <p><b>Relinquished by:</b> Date/Time: Company:</p> <p><b>Custody Seals Intact:</b> <input type="checkbox"/> Yes <input type="checkbox"/> No <b>Custody Seal No.:</b></p>									
<p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months</p> <p><b>Special Instructions/QC Requirements:</b></p> <p><b>Received by:</b> <i>Sunday Bunker</i> Date/Time: 2-6-20 1840 Company:</p> <p><b>Received by:</b> Date/Time: Company:</p> <p><b>Received by:</b> Date/Time: Company:</p> <p><b>Cooler Temperature(s) °C and Other Remarks:</b></p>									

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Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-175270-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309
<b>Appendix III Parameters</b>													
Boron	x	x						x	x	x	x	x	7
Calcium	x	x						x	x	x	x	x	7
Chloride	x	x						x	x	x	x	x	7
Fluoride								x	x				2
pH	x	x						x	x	x	x	x	7
Sulfate	x	x						x	x	x	x	x	7
TDS	x	x						x	x	x	x	x	7
<b>Appendix IV Parameters</b>													
Antimony								x	x				2
Arsenic	x	x						x	x	x	x	x	7
Barium	x	x						x	x	x	x	x	7
Beryllium								x	x				2
Cadmium	x	x						x	x	x	x	x	7
Chromium	x	x						x	x	x	x	x	7
Cobalt	x	x						x	x	x	x	x	7
Fluoride								x	x				2
Lead	x	x						x	x	x	x	x	7
Lithium	x	x						x	x	x	x	x	7
Mercury								x	x				2
Molybdenum								x	x				2
Selenium								x	x				2
Thallium								x	x				2
Radium	x	x						x	x	x	x	x	7
<b>Field Parameters</b>													
Groundwater Elevation	x							x	x	x	x	x	6
Well Depth	x							x	x	x	x	x	6
pH (field)	x							x	x	x	x	x	6
Specific Conductance	x							x	x	x	x	x	6
Dissolved Oxygen	x							x	x	x	x	x	6
ORP	x							x	x	x	x	x	6
Temperature	x							x	x	x	x	x	6
Turbidity	x							x	x	x	x	x	6
Color	x							x	x	x	x	x	6
Odor	x							x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-7

SDG Number: MW-311

**Login Number: 175270**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Field Blank 250 HNO3 has MW-301, time matches FB with 2359, lid marked FB.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175270-8

Laboratory Sample Delivery Group: MW-311 Rad  
Client Project/Site: Ottumwa Generating Station 25219072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:*

*3/4/2020 11:09:38 AM*

Jim Knapp, Project Manager II  
(630)758-0262

[jim.knapp@testamericainc.com](mailto:jim.knapp@testamericainc.com)

Designee for

Sandie Fredrick, Project Manager II  
(920)261-1660

[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

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results through  
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[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

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## Job ID: 310-175270-8

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### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-175270-8

#### Comments

No additional comments.

#### Receipt

The samples were received on 2/6/2020 6:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice.

#### RAD

Methods 903.0, 9315: Radium-226 Prep Batch 160-459800

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-311 (310-175270-3), (LCS 160-459800/1-A), (LCSD 160-459800/2-A) and (MB 160-459800/21-A)

Methods 904.0, 9320: Ra-228 Prep Batch 160-459801

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-311 (310-175270-3), (LCS 160-459801/1-A), (LCSD 160-459801/2-A) and (MB 160-459801/21-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175270-3	MW-311	Water	02/05/20 08:50	02/06/20 18:40	

---

1

2

3

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5

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7

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15

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

No Detections.

1

2

3

4

5

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7

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10

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12

13

14

15

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
 SDG: MW-311 Rad

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

Date Collected: 02/05/20 08:50

Matrix: Water

Date Received: 02/06/20 18:40

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0368	U	0.0799	0.0800	1.00	0.141	pCi/L	02/10/20 12:07	03/03/20 11:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.2		40 - 110					02/10/20 12:07	03/03/20 11:59	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0711	U	0.250	0.251	1.00	0.437	pCi/L	02/10/20 12:27	02/18/20 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.2		40 - 110					02/10/20 12:27	02/18/20 17:26	1
Y Carrier	86.0		40 - 110					02/10/20 12:27	02/18/20 17:26	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.108	U	0.262	0.263	5.00	0.437	pCi/L		03/04/20 08:50	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
 SDG: MW-311 Rad

## Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-459800/21-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	-0.007253	U	0.0361	0.0361	1.00	0.0814	pCi/L	02/10/20 12:07	03/03/20 11:59	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	103		40 - 110		02/10/20 12:07	03/03/20 11:59	1			

Lab Sample ID: LCS 160-459800/1-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	8.658		0.901	1.00	0.111	pCi/L	76	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	110		40 - 110						

Lab Sample ID: LCSD 160-459800/2-A  
 Matrix: Water  
 Analysis Batch: 462625

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 459800

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	9.170		0.952	1.00	0.0937	pCi/L	81	75 - 125	0.28	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	103		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-459801/21-A  
 Matrix: Water  
 Analysis Batch: 460917

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459801

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	-0.07100	U	0.183	0.183	1.00	0.346	pCi/L	02/10/20 12:27	02/18/20 17:26	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	103		40 - 110		02/10/20 12:27	02/18/20 17:26	1			
Y Carrier	87.9		40 - 110		02/10/20 12:27	02/18/20 17:26	1			

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
 SDG: MW-311 Rad

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-459801/1-A**

**Matrix: Water**

**Analysis Batch: 460918**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

**Prep Batch: 459801**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
<b>Carrier</b>		<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>					
Ba Carrier		110		40 - 110					
Y Carrier		87.1		40 - 110					

**Lab Sample ID: LCSD 160-459801/2-A**

**Matrix: Water**

**Analysis Batch: 460918**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total/NA**

**Prep Batch: 459801**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
											1
Radium-228	9.10	8.440		1.01	1.00	0.396	pCi/L	93	75 - 125	0.33	1
<b>Carrier</b>		<b>LCSD %Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>							
Ba Carrier		103		40 - 110							
Y Carrier		87.1		40 - 110							

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

## Rad

### Prep Batch: 459800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	PrecSep-21	
MB 160-459800/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-459800/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-459800/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 459801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-3	MW-311	Total/NA	Water	PrecSep_0	
MB 160-459801/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-459801/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-459801/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	



# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

**Client Sample ID: MW-311**

**Lab Sample ID: 310-175270-3**

**Date Collected: 02/05/20 08:50**

**Matrix: Water**

**Date Received: 02/06/20 18:40**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			459800	02/10/20 12:07	MNH	TAL SL
Total/NA	Analysis	903.0		1	462625	03/03/20 11:59	AJD	TAL SL
Total/NA	Prep	PrecSep_0			459801	02/10/20 12:27	MNH	TAL SL
Total/NA	Analysis	904.0		1	460917	02/18/20 17:26	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	463040	03/04/20 08:50	SMP	TAL SL

**Laboratory References:**

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
 SDG: MW-311 Rad

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20 *
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Pos			
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency  
None = None  
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u> STATE <u>MN</u>	Project: <u>Ottumwa</u>	
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u> TIME <u>1840</u>	Received By: <u>LAB</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.4</u>	Corrected Temp (°C): <u>2.5</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

**Chain of Custody Record**

<b>Client Information</b> Client Contact: Louise Jennings Company: SCS Engineers Address: 8450 Hickman Road, Suite 20 City: Clive State: IA, Zip: 50325 Phone: 25219072 Email: ljennings@scsengineers.com Project Name: Ottumwa Generating Station 25219072 Site:		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carrier Tracking No(s): COC No: 310-47095-14655.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days): PO #: 25219072 WO #:		<b>Analysis Requested</b> 2540C_Calcd, 9056A_ORGFM_28D, SM4500_H+ 6020A_7470A 903.0_904.0 Perform MSMSD (Yes or No)	
Sample Identification MW-301 MW-309 MW-311 Field Blank		Field Filtered Sample (Yes or No) D D N X X X X X X X X X X X X	
Sample Date 2/5/20 I I		Sample Time 0945 1100 0850 2359	
Sample Type (C=Comp, G=grab) G G G G		Matrix (W=water, S=solid, O=soil, A=air) Water Water Water Water Water Water Water	
Preservation Code: A-HCL B-NaOH C-Zn Acetate D-Nitric Acid E-NaHSO4 F-MeOH G-Amchlor H-Ascorbic Acid I-Ice J-DI Water K-EDTA L-EDA Other:		Preservation Codes: M-Hexane N-None O-AsNaO2 P-Na2O4S Q-Na2SO3 R-Na2S2O3 S-H2SO4 T-TSP Dodecahydrate U-Acetone V-MCAA W-pH 4-5 Z-other (specify)	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by: <i>Jennings</i> Date/Time: 2/5/20 500pm Company: SCS Relinquished by: <i>Jennings</i> Date/Time: Company: Relinquished by: Date/Time: Company:		Received by: <i>Sunday Bunker</i> Date/Time: 2-6-20 1840 Company: Received by: Date/Time: Company: Received by: Date/Time: Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks:	



Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-175270-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____



**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL			
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309		
<b>Appendix III Parameters</b>	Boron	x	x							x	x	x	x	x	7
	Calcium	x	x							x	x	x	x	x	7
	Chloride	x	x							x	x	x	x	x	7
	Fluoride									x	x				2
	pH	x	x							x	x	x	x	x	7
	Sulfate	x	x							x	x	x	x	x	7
	TDS	x	x							x	x	x	x	x	7
<b>Appendix IV Parameters</b>	Antimony									x	x				2
	Arsenic	x	x							x	x	x	x	x	7
	Barium	x	x							x	x	x	x	x	7
	Beryllium									x	x				2
	Cadmium	x	x							x	x	x	x	x	7
	Chromium	x	x							x	x	x	x	x	7
	Cobalt	x	x							x	x	x	x	x	7
	Fluoride									x	x				2
	Lead	x	x							x	x	x	x	x	7
	Lithium	x	x							x	x	x	x	x	7
	Mercury									x	x				2
	Molybdenum									x	x				2
	Selenium									x	x				2
	Thallium									x	x				2
Radium	x	x							x	x	x	x	x	7	
<b>Field Parameters</b>	Groundwater Elevation	x								x	x	x	x	x	6
	Well Depth	x								x	x	x	x	x	6
	pH (field)	x								x	x	x	x	x	6
	Specific Conductance	x								x	x	x	x	x	6
	Dissolved Oxygen	x								x	x	x	x	x	6
	ORP	x								x	x	x	x	x	6
	Temperature	x								x	x	x	x	x	6
	Turbidity	x								x	x	x	x	x	6
	Color	x								x	x	x	x	x	6
	Odor	x								x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-8

SDG Number: MW-311 Rad

**Login Number: 175270**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Field Blank 250 HNO3 has MW-301, time matches FB with 2359, lid marked FB.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-8

SDG Number: MW-311 Rad

**Login Number: 175270**

**List Number: 2**

**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 02/08/20 10:20 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	21.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-8  
SDG: MW-311 Rad

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
310-175270-3	MW-311	90.2	
LCS 160-459800/1-A	Lab Control Sample	110	
LCSD 160-459800/2-A	Lab Control Sample Dup	103	
MB 160-459800/21-A	Method Blank	103	

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
310-175270-3	MW-311	90.2	86.0
LCS 160-459801/1-A	Lab Control Sample	110	87.1
LCSD 160-459801/2-A	Lab Control Sample Dup	103	87.1
MB 160-459801/21-A	Method Blank	103	87.9

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier  
Y Carrier = Y Carrier

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175272-3  
Laboratory Sample Delivery Group: MW-310  
Client Project/Site: Ottumwa Generating Station 25219072

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
2/18/2020 12:02:09 PM

Sandie Fredrick, Project Manager II  
(920)261-1660  
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### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

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## Job ID: 310-175272-3

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Laboratory: Eurofins TestAmerica, Cedar Falls

### Narrative

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Job Narrative  
310-175272-3

### Comments

No additional comments.

### Receipt

The samples were received on 2/6/2020 6:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.0° C.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175272-3	MW-310	Water	02/05/20 14:50	02/06/20 18:40	

---

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
 SDG: MW-310

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	120		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.85		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	530		20	14	mg/L	20		9056A	Total/NA
Barium	53		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	620		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.12		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	160		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.32	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	42		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	29		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	3.3	J	5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1200		60	52	mg/L	1		SM 2540C	Total/NA
pH	7.1	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	644.71				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	42.2				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.68				mg/L	1		Field Sampling	Total/NA
pH, Field	7.08				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1723				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.49				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.90				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
 SDG: MW-310

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

Date Collected: 02/05/20 14:50

Matrix: Water

Date Received: 02/06/20 18:40

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		5.0	2.0	mg/L			02/11/20 17:57	5
Fluoride	0.85		0.50	0.23	mg/L			02/11/20 17:57	5
Sulfate	530		20	14	mg/L			02/12/20 11:14	20

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		02/10/20 08:15	02/11/20 19:24	1
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 19:24	1
Barium	53		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 19:24	1
Beryllium	<0.27		1.0	0.27	ug/L		02/10/20 08:15	02/11/20 19:24	1
Boron	620		200	100	ug/L		02/10/20 08:15	02/11/20 19:24	1
Cadmium	0.12		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 19:24	1
Calcium	160		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 19:24	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 19:24	1
Cobalt	0.32	J	0.50	0.091	ug/L		02/10/20 08:15	02/11/20 19:24	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 19:24	1
Lithium	42		10	2.3	ug/L		02/10/20 08:15	02/11/20 19:24	1
Molybdenum	29		2.0	1.1	ug/L		02/10/20 08:15	02/11/20 19:24	1
Selenium	3.3	J	5.0	1.0	ug/L		02/10/20 08:15	02/11/20 19:24	1
Thallium	<0.26		1.0	0.26	ug/L		02/10/20 08:15	02/11/20 19:24	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		02/10/20 10:54	02/11/20 14:24	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1200		60	52	mg/L			02/11/20 10:45	1
pH	7.1	HF	0.1	0.1	SU			02/06/20 22:17	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	644.71				ft			02/05/20 14:50	1
Oxidation Reduction Potential	42.2				millivolts			02/05/20 14:50	1
Oxygen, Dissolved, Client Supplied	0.68				mg/L			02/05/20 14:50	1
pH, Field	7.08				SU			02/05/20 14:50	1
Specific Conductance, Field	1723				umhos/cm			02/05/20 14:50	1
Temperature, Field	12.49				Degrees C			02/05/20 14:50	1
Turbidity, Field	0.90				NTU			02/05/20 14:50	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

## Qualifiers

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
 SDG: MW-310

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-270339/3**  
**Matrix: Water**  
**Analysis Batch: 270339**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			02/11/20 14:48	1
Fluoride	<0.046		0.10	0.046	mg/L			02/11/20 14:48	1
Sulfate	<0.71		1.0	0.71	mg/L			02/11/20 14:48	1

**Lab Sample ID: LCS 310-270339/4**  
**Matrix: Water**  
**Analysis Batch: 270339**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	10.0		mg/L		100	90 - 110
Fluoride	2.00	1.94		mg/L		97	90 - 110
Sulfate	10.0	10.3		mg/L		103	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-269745/1-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		02/10/20 08:15	02/11/20 18:39	1
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 18:39	1
Barium	<0.90		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 18:39	1
Beryllium	<0.27		1.0	0.27	ug/L		02/10/20 08:15	02/11/20 18:39	1
Boron	<100		200	100	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cadmium	<0.039		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 18:39	1
Calcium	<0.19		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 18:39	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cobalt	<0.091		0.50	0.091	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lithium	<2.3		10	2.3	ug/L		02/10/20 08:15	02/11/20 18:39	1
Molybdenum	<1.1		2.0	1.1	ug/L		02/10/20 08:15	02/11/20 18:39	1
Selenium	<1.0		5.0	1.0	ug/L		02/10/20 08:15	02/11/20 18:39	1
Thallium	<0.26		1.0	0.26	ug/L		02/10/20 08:15	02/11/20 18:39	1

**Lab Sample ID: LCS 310-269745/2-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	80.0	66.6		ug/L		83	80 - 120
Barium	80.0	72.9		ug/L		91	80 - 120
Beryllium	40.0	37.9		ug/L		95	80 - 120
Boron	1760	1580		ug/L		90	80 - 120
Cadmium	40.0	36.6		ug/L		91	80 - 120
Calcium	4.00	3.60		mg/L		90	80 - 120
Chromium	80.0	72.3		ug/L		90	80 - 120
Cobalt	40.0	37.0		ug/L		92	80 - 120
Lead	40.0	37.6		ug/L		94	80 - 120

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# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-269745/2-A  
Matrix: Water  
Analysis Batch: 270025

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 269745

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	200	165		ug/L		82	80 - 120
Selenium	80.0	68.1		ug/L		85	80 - 120
Thallium	32.0	28.2		ug/L		88	80 - 120

Lab Sample ID: LCS 310-269745/2-A  
Matrix: Water  
Analysis Batch: 270292

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 269745

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	40.0	35.7		ug/L		89	80 - 120
Molybdenum	80.0	75.9		ug/L		95	80 - 120

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-269795/1-A  
Matrix: Water  
Analysis Batch: 269985

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 269795

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		02/10/20 10:54	02/11/20 14:17	1

Lab Sample ID: LCS 310-269795/2-A  
Matrix: Water  
Analysis Batch: 269985

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 269795

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.85		ug/L		111	80 - 120

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-269931/1  
Matrix: Water  
Analysis Batch: 269931

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			02/11/20 10:45	1

Lab Sample ID: LCS 310-269931/2  
Matrix: Water  
Analysis Batch: 269931

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	970		mg/L		97	90 - 110

Lab Sample ID: 310-175272-3 DU  
Matrix: Water  
Analysis Batch: 269931

Client Sample ID: MW-310  
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1200		1160		mg/L		2	24

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

## HPLC/IC

### Analysis Batch: 270339

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	9056A	
310-175272-3	MW-310	Total/NA	Water	9056A	
MB 310-270339/3	Method Blank	Total/NA	Water	9056A	
LCS 310-270339/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 269745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	3010A	
MB 310-269745/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Prep Batch: 269795

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	7470A	
MB 310-269795/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-269795/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 269985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	7470A	269795
MB 310-269795/1-A	Method Blank	Total/NA	Water	7470A	269795
LCS 310-269795/2-A	Lab Control Sample	Total/NA	Water	7470A	269795

### Analysis Batch: 270025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

### Analysis Batch: 270043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

### Analysis Batch: 270292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

## General Chemistry

### Analysis Batch: 269585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 269931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	SM 2540C	
MB 310-269931/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-269931/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

## General Chemistry (Continued)

### Analysis Batch: 269931 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3 DU	MW-310	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 270470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	Field Sampling	

- 1
- 2
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# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

**Date Collected: 02/05/20 14:50**

**Matrix: Water**

**Date Received: 02/06/20 18:40**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	270339	02/11/20 17:57	ACJ	TAL CF
Total/NA	Analysis	9056A		20	270339	02/12/20 11:14	ACJ	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270025	02/11/20 19:24	SAD	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270043	02/11/20 19:24	SAD	TAL CF
Total/NA	Prep	7470A			269795	02/10/20 10:54	HIS	TAL CF
Total/NA	Analysis	7470A		1	269985	02/11/20 14:24	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	269931	02/11/20 10:45	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	269585	02/06/20 22:17	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	270470	02/05/20 14:50	EAR	TAL CF

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

- 1
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\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-3  
SDG: MW-310

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





310-175272 Chain of Custody

**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u>	STATE <u>MN</u>	Project: <u>Ottumwa</u>
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u>	TIME <u>1840</u>	Received By: <u>LAB</u>
Delivery Type:	<input type="checkbox"/> UPS	<input type="checkbox"/> FedEx	<input type="checkbox"/> FedEx Ground
	<input checked="" type="checkbox"/> Lab Courier	<input type="checkbox"/> Lab Field Services	<input type="checkbox"/> Client Drop-off
		<input type="checkbox"/> US Mail	<input type="checkbox"/> Spee-Dee
			<input type="checkbox"/> Other: _____
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice	<input type="checkbox"/> Blue ice	<input type="checkbox"/> Dry ice
			<input type="checkbox"/> Other: _____
			<input type="checkbox"/> NONE
Thermometer ID: <u>M</u>	Correction Factor (°C): <u>+0.1</u>		
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.9</u>	Corrected Temp (°C): <u>1.0</u>		
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

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**TestAmerica Docs Manager**  
Carrier Tracking Number: 214

**Client Information**  
 Sampler: Louise Jennings  
 Lab PM: Fredrick, Sandie  
 Phone: 609 509 8245  
 E-Mail: sandie.fredrick@testamericainc.com  
 COC No: 310-47095-14655.1  
 Page: Page 1 of 1  
 Job #:

**SCS Engineers**  
 Address: 8450 Hickman Road Suite 20  
 City: Clive  
 State, Zip: IA, 50325  
 Phone: 25219072  
 Email: jennings@scsengineers.com  
 Project Name: Ottumwa Generating Station 25219072  
 Site:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Soil, Onstream, Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested		Special Instructions/Note:
							6020A, 7470A	903.0, 904.0	
MW-308	9/5/20	1225	G	Water	X	X			
MW-307	+	1130	I	Water	X	X			
MW-310	+	1150	I	Water	X	X			
				Water					
				Water					
				Water					
				Water					

**Possible Hazard Identification**  
 Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological

**Deliverable Requested:** 1, II, III, IV, Other (specify)

**Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**  
 Return To Client  Disposal By Lab  Archive For Months

**Special Instructions/QC Requirements:**

**Empty Kit Relinquished by:** Date: Date: Date: Method of Shipment:

**Relinquished by:** Date/Time: 2/5/20 500 Company SCS  
 Received by: Lindsay Bredert Date/Time: 2-6-20 1840 Company  
 Relinquished by: Date/Time: Company  
 Received by: Date/Time: Company

**Custody Seals Intact:**  Yes  No **Custody Seal No.:**

**Cooler Temperature(s) °C and Other Remarks:**



Temperature readings: \_\_\_\_\_

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-175272-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-175272-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-175272-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309
<b>Appendix III Parameters</b>													
Boron	x	x						x	x	x	x	x	7
Calcium	x	x						x	x	x	x	x	7
Chloride	x	x						x	x	x	x	x	7
Fluoride								x	x				2
pH	x	x						x	x	x	x	x	7
Sulfate	x	x						x	x	x	x	x	7
TDS	x	x						x	x	x	x	x	7
<b>Appendix IV Parameters</b>													
Antimony								x	x				2
Arsenic	x	x						x	x	x	x	x	7
Barium	x	x						x	x	x	x	x	7
Beryllium								x	x				2
Cadmium	x	x						x	x	x	x	x	7
Chromium	x	x						x	x	x	x	x	7
Cobalt	x	x						x	x	x	x	x	7
Fluoride								x	x				2
Lead	x	x						x	x	x	x	x	7
Lithium	x	x						x	x	x	x	x	7
Mercury								x	x				2
Molybdenum								x	x				2
Selenium								x	x				2
Thallium								x	x				2
Radium	x	x						x	x	x	x	x	7
<b>Field Parameters</b>													
Groundwater Elevation	x							x	x	x	x	x	6
Well Depth	x							x	x	x	x	x	6
pH (field)	x							x	x	x	x	x	6
Specific Conductance	x							x	x	x	x	x	6
Dissolved Oxygen	x							x	x	x	x	x	6
ORP	x							x	x	x	x	x	6
Temperature	x							x	x	x	x	x	6
Turbidity	x							x	x	x	x	x	6
Color	x							x	x	x	x	x	6
Odor	x							x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175272-3

SDG Number: MW-310

**Login Number: 175272**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175272-4  
Laboratory Sample Delivery Group: MW-310 Rad  
Client Project/Site: Ottumwa Generating Station 25219072

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
3/4/2020 11:35:13 AM  
Jim Knapp, Project Manager II  
(630)758-0262  
[jim.knapp@testamericainc.com](mailto:jim.knapp@testamericainc.com)

Designee for  
Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

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results through  
**TotalAccess**

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[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

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## Job ID: 310-175272-4

---

### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-175272-4

#### Comments

No additional comments.

#### Receipt

The samples were received on 2/6/2020 6:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice.

#### RAD

Methods 903.0, 9315: Ra-226 Prep Batch 160-459790

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-310 (310-175272-3), (LCS 160-459790/1-A), (LCSD 160-459790/2-A) and (MB 160-459790/23-A)

Methods 904.0, 9320: Ra-228 Prep Batch 160-459791

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-310 (310-175272-3), (LCS 160-459791/1-A), (LCSD 160-459791/2-A) and (MB 160-459791/23-A)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

---

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175272-3	MW-310	Water	02/05/20 14:50	02/06/20 18:40	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

No Detections.

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This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
 SDG: MW-310 Rad

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

Date Collected: 02/05/20 14:50

Matrix: Water

Date Received: 02/06/20 18:40

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0344	U	0.0779	0.0780	1.00	0.140	pCi/L	02/10/20 10:38	03/03/20 11:18	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.5		40 - 110					02/10/20 10:38	03/03/20 11:18	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.137	U	0.249	0.249	1.00	0.468	pCi/L	02/10/20 11:00	02/25/20 17:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.5		40 - 110					02/10/20 11:00	02/25/20 17:36	1
Y Carrier	88.2		40 - 110					02/10/20 11:00	02/25/20 17:36	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.0344	U	0.261	0.261	5.00	0.468	pCi/L		03/04/20 10:45	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
 SDG: MW-310 Rad

## Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-459790/23-A  
 Matrix: Water  
 Analysis Batch: 462630

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459790

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.01193	U	0.0438	0.0438	1.00	0.0864	pCi/L	02/10/20 10:38	03/03/20 13:07	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	104		40 - 110		02/10/20 10:38	03/03/20 13:07	1			

Lab Sample ID: LCS 160-459790/1-A  
 Matrix: Water  
 Analysis Batch: 462630

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 459790

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	9.766		1.03	1.00	0.0863	pCi/L	86	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	98.8		40 - 110						

Lab Sample ID: LCSD 160-459790/2-A  
 Matrix: Water  
 Analysis Batch: 462630

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 459790

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	9.634		1.02	1.00	0.135	pCi/L	85	75 - 125	0.06	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	102		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-459791/23-A  
 Matrix: Water  
 Analysis Batch: 461694

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 459791

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.1138	U	0.204	0.204	1.00	0.347	pCi/L	02/10/20 11:00	02/25/20 17:42	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	104		40 - 110		02/10/20 11:00	02/25/20 17:42	1			
Y Carrier	90.5		40 - 110		02/10/20 11:00	02/25/20 17:42	1			

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
 SDG: MW-310 Rad

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-459791/1-A**  
**Matrix: Water**  
**Analysis Batch: 461720**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 459791**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-228	9.08	8.884		1.05	1.00	0.425	pCi/L	98	75 - 125	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
Ba Carrier	98.8		40 - 110							
Y Carrier	88.2		40 - 110							

**Lab Sample ID: LCSD 160-459791/2-A**  
**Matrix: Water**  
**Analysis Batch: 461720**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 459791**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.08	8.363		0.994	1.00	0.396	pCi/L	92	75 - 125	0.25	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	102		40 - 110								
Y Carrier	88.2		40 - 110								

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

## Rad

### Prep Batch: 459790

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	PrecSep-21	
MB 160-459790/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-459790/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-459790/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 459791

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175272-3	MW-310	Total/NA	Water	PrecSep_0	
MB 160-459791/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-459791/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-459791/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

**Client Sample ID: MW-310**

**Lab Sample ID: 310-175272-3**

**Date Collected: 02/05/20 14:50**

**Matrix: Water**

**Date Received: 02/06/20 18:40**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			459790	02/10/20 10:38	MNH	TAL SL
Total/NA	Analysis	903.0		1	462630	03/03/20 11:18	AJD	TAL SL
Total/NA	Prep	PrecSep_0			459791	02/10/20 11:00	MNH	TAL SL
Total/NA	Analysis	904.0		1	461720	02/25/20 17:36	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	463071	03/04/20 10:45	SMP	TAL SL

**Laboratory References:**

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
 SDG: MW-310 Rad

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20 *
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Pos			
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency  
None = None  
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u> STATE <u>MN</u>	Project: <u>Ottumwa</u>	
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u> TIME <u>1840</u>	Received By: <u>LAB</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>0.9</u>	Corrected Temp (°C): <u>1.0</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

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**TestAmerica Docs Mailing Notes**  
Carrier Tracking Number: 214

<b>Client Information</b> Louise Jennings Company: SCS Engineers Address: 8450 Hickman Road Suite 20 City: Clive State, Zip: IA, 50325 Phone: 25219072 Email: jennings@scsengineers.com Project Name: Ottumwa Generating Station 25219072 Site:		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com CIOC No: 310-47095-14655.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days): PO #: WO #: Project #: SSOW#:		<b>Analysis Requested</b> Field Filtered Sample (Yes or No) [X] [ ] Perform MS/MSD (Yes or No) [X] [ ] 903.0, 904.0 [X] [ ] [D] [ ] [N] [ ] 6020A, 7470A [X] [ ] [D] [ ] [N] [ ] 2540C, Calcd, 9056A_ORGFM_28D, SM4500_H+ [X] [ ] [D] [ ] [N] [ ] Total Number of Containers: [X] [ ]	
<b>Sample Identification</b> MW-308 MW-307 MW-310		Matrix (Water, Sewer, Effluent, Groundwater, Surface Water, Air) [X] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Sample Type (C=Comp, G=Grab) [X] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Sample Time: 1225 G, 1130 I, 1150 I Sample Date: 9/5/20, I, I Preservation Code: [X] [ ] [ ] [ ] [ ] [ ] [ ] [ ] Water, Water, Water, Water, Water, Water, Water	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			
Deliverable Requested: I, II, III, IV, Other (specify)			
Empty Kit Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]			
Date/Time: 9/5/20 500 Date/Time: 2/6/20 1840 Date/Time:		Date/Time: [ ] [ ] [ ] [ ] [ ] [ ] Date/Time: [ ] [ ] [ ] [ ] [ ] [ ] Date/Time: [ ] [ ] [ ] [ ] [ ] [ ]	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	

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Temperature readings: \_\_\_\_\_

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-175272-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-175272-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-175272-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-175272-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-175272-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309
<b>Appendix III Parameters</b>													
Boron	x	x						x	x	x	x	x	7
Calcium	x	x						x	x	x	x	x	7
Chloride	x	x						x	x	x	x	x	7
Fluoride								x	x				2
pH	x	x						x	x	x	x	x	7
Sulfate	x	x						x	x	x	x	x	7
TDS	x	x						x	x	x	x	x	7
<b>Appendix IV Parameters</b>													
Antimony								x	x				2
Arsenic	x	x						x	x	x	x	x	7
Barium	x	x						x	x	x	x	x	7
Beryllium								x	x				2
Cadmium	x	x						x	x	x	x	x	7
Chromium	x	x						x	x	x	x	x	7
Cobalt	x	x						x	x	x	x	x	7
Fluoride								x	x				2
Lead	x	x						x	x	x	x	x	7
Lithium	x	x						x	x	x	x	x	7
Mercury								x	x				2
Molybdenum								x	x				2
Selenium								x	x				2
Thallium								x	x				2
Radium	x	x						x	x	x	x	x	7
<b>Field Parameters</b>													
Groundwater Elevation	x							x	x	x	x	x	6
Well Depth	x							x	x	x	x	x	6
pH (field)	x							x	x	x	x	x	6
Specific Conductance	x							x	x	x	x	x	6
Dissolved Oxygen	x							x	x	x	x	x	6
ORP	x							x	x	x	x	x	6
Temperature	x							x	x	x	x	x	6
Turbidity	x							x	x	x	x	x	6
Color	x							x	x	x	x	x	6
Odor	x							x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175272-4

SDG Number: MW-310 Rad

**Login Number: 175272**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175272-4

SDG Number: MW-310 Rad

**Login Number: 175272**

**List Number: 2**

**Creator: Hellm, Michael**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 02/08/20 10:20 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	21.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175272-4  
SDG: MW-310 Rad

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	
310-175272-3	MW-310	89.5	
LCS 160-459790/1-A	Lab Control Sample	98.8	
LCSD 160-459790/2-A	Lab Control Sample Dup	102	
MB 160-459790/23-A	Method Blank	104	

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
310-175272-3	MW-310	89.5	88.2
LCS 160-459791/1-A	Lab Control Sample	98.8	88.2
LCSD 160-459791/2-A	Lab Control Sample Dup	102	88.2
MB 160-459791/23-A	Method Blank	104	90.5

**Tracer/Carrier Legend**  
Ba Carrier = Ba Carrier  
Y Carrier = Y Carrier

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-175270-1

Client Project/Site: Ottumwa Generating Station 25219072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
2/18/2020 12:10:09 PM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

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## Job ID: 310-175270-1

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Laboratory: Eurofins TestAmerica, Cedar Falls

### Narrative

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Job Narrative  
310-175270-1

### Comments

No additional comments.

### Receipt

The samples were received on 2/6/2020 6:40 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-175270-1	MW-301	Water	02/05/20 09:45	02/06/20 18:40	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-175270-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	120		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	130		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	43		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	540		200	100	ug/L	1		6020A	Total/NA
Calcium	68		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	1.1		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	17		10	2.3	ug/L	1		6020A	Total/NA
Total Dissolved Solids	570		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	683.30				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	68.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	7.28				mg/L	1		Field Sampling	Total/NA
pH, Field	6.39				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	966				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	5.38				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.43				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-175270-1**

Date Collected: 02/05/20 09:45

Matrix: Water

Date Received: 02/06/20 18:40

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		5.0	2.0	mg/L			02/10/20 23:37	5
Sulfate	130		5.0	3.6	mg/L			02/10/20 23:37	5

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 19:08	1
Barium	43		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 19:08	1
Boron	540		200	100	ug/L		02/10/20 08:15	02/11/20 19:08	1
Cadmium	<0.039		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 19:08	1
Calcium	68		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 19:08	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 19:08	1
Cobalt	1.1		0.50	0.091	ug/L		02/10/20 08:15	02/11/20 19:08	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 19:08	1
Lithium	17		10	2.3	ug/L		02/10/20 08:15	02/11/20 19:08	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	570		30	26	mg/L			02/11/20 10:45	1
pH	6.7	HF	0.1	0.1	SU			02/06/20 22:02	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	683.30				ft			02/05/20 09:45	1
Oxidation Reduction Potential	68.0				millivolts			02/05/20 09:45	1
Oxygen, Dissolved, Client Supplied	7.28				mg/L			02/05/20 09:45	1
pH, Field	6.39				SU			02/05/20 09:45	1
Specific Conductance, Field	966				umhos/cm			02/05/20 09:45	1
Temperature, Field	5.38				Degrees C			02/05/20 09:45	1
Turbidity, Field	1.43				NTU			02/05/20 09:45	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

## Qualifiers

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-270331/3**  
**Matrix: Water**  
**Analysis Batch: 270331**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			02/10/20 17:19	1
Sulfate	<0.71		1.0	0.71	mg/L			02/10/20 17:19	1

**Lab Sample ID: LCS 310-270331/4**  
**Matrix: Water**  
**Analysis Batch: 270331**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.97		mg/L		100	90 - 110
Sulfate	10.0	10.2		mg/L		102	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-269745/1-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.88		2.0	0.88	ug/L		02/10/20 08:15	02/11/20 18:39	1
Barium	<0.90		2.0	0.90	ug/L		02/10/20 08:15	02/11/20 18:39	1
Boron	<100		200	100	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cadmium	<0.039		0.10	0.039	ug/L		02/10/20 08:15	02/11/20 18:39	1
Calcium	<0.19		0.50	0.19	mg/L		02/10/20 08:15	02/11/20 18:39	1
Chromium	<1.1		5.0	1.1	ug/L		02/10/20 08:15	02/11/20 18:39	1
Cobalt	<0.091		0.50	0.091	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lead	<0.27		0.50	0.27	ug/L		02/10/20 08:15	02/11/20 18:39	1
Lithium	<2.3		10	2.3	ug/L		02/10/20 08:15	02/11/20 18:39	1

**Lab Sample ID: LCS 310-269745/2-A**  
**Matrix: Water**  
**Analysis Batch: 270025**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 269745**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	80.0	66.6		ug/L		83	80 - 120
Barium	80.0	72.9		ug/L		91	80 - 120
Boron	1760	1580		ug/L		90	80 - 120
Cadmium	40.0	36.6		ug/L		91	80 - 120
Calcium	4.00	3.60		mg/L		90	80 - 120
Chromium	80.0	72.3		ug/L		90	80 - 120
Cobalt	40.0	37.0		ug/L		92	80 - 120
Lead	40.0	37.6		ug/L		94	80 - 120
Lithium	200	165		ug/L		82	80 - 120

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-269931/1  
 Matrix: Water  
 Analysis Batch: 269931

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			02/11/20 10:45	1

Lab Sample ID: LCS 310-269931/2  
 Matrix: Water  
 Analysis Batch: 269931

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	970		mg/L		97	90 - 110

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-269585/1  
 Matrix: Water  
 Analysis Batch: 269585

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		99	98 - 102

- 1
- 2
- 3
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- 12
- 13
- 14

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

## HPLC/IC

### Analysis Batch: 270331

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	9056A	
MB 310-270331/3	Method Blank	Total/NA	Water	9056A	
LCS 310-270331/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 269745

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	3010A	
MB 310-269745/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Analysis Batch: 270025

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

### Analysis Batch: 270043

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	6020A	269745
MB 310-269745/1-A	Method Blank	Total/NA	Water	6020A	269745
LCS 310-269745/2-A	Lab Control Sample	Total/NA	Water	6020A	269745

## General Chemistry

### Analysis Batch: 269585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	SM 4500 H+ B	
LCS 310-269585/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 269931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	SM 2540C	
MB 310-269931/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-269931/2	Lab Control Sample	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 270470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-175270-1	MW-301	Total/NA	Water	Field Sampling	

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

**Client Sample ID: MW-301**

**Date Collected: 02/05/20 09:45**

**Date Received: 02/06/20 18:40**

**Lab Sample ID: 310-175270-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	270331	02/10/20 23:37	ACJ	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270025	02/11/20 19:08	SAD	TAL CF
Total/NA	Prep	3010A			269745	02/10/20 08:15	HED	TAL CF
Total/NA	Analysis	6020A		1	270043	02/11/20 19:08	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	269931	02/11/20 10:45	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	269585	02/06/20 22:02	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	270470	02/05/20 09:45	EAR	TAL CF

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-19 *

- 1
- 2
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\* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-175270-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State:	CITY <u>Minneapolis</u> STATE <u>MN</u>	Project: <u>Ottumwa</u>	
Receipt Information			
Date/Time Received:	DATE <u>2.6.20</u> TIME <u>1840</u>	Received By: <u>LAB</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>2.4</u>	Corrected Temp (°C): <u>2.5</u>	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

**Chain of Custody Record**

<b>Client Information</b>		Sampler: <i>Cause Jennings</i>		Lab PM: Fredrick, Sandie		Carrier Tracking No(s):		COC No: 310-47095-14655.1	
Client Contact: Louise Jennings		Phone: 608-509-5445		E-Mail: sandie.fredrick@testamericainc.com		Page: Page 1 of 1		Job #:	
Company: SCS Engineers		Address: 8450 Hickman Road, Suite 20		City: Clive		State, Zip: IA, 50325		Phone: 25219072	
Email: <i>ljennings@scsengineers.com</i>		Project #: 31011020		SSOW#:		Due Date Requested:		Analysis Requested	
TAT Requested (days):		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=water, S=solid, O=soil, A=air)	
PO #: 25219072		2/5/20		0945		G		Water	
WO #:		I		1100		G		Water	
Project Name: Ottumwa Generating Station 25219072		I		0850		G		Water	
Site:		Field Blank		2359		G		Water	
Field Filtered Sample (Yes or No)		D		D		N		Special Instructions/Note:	
Perform MSMSD (Yes or No)		X		X		X		Total Number of containers	
903.0, 904.0		X		X		X		X	
6020A, 7470A		X		X		X		X	
2540C, Calc'd, 9056A, ORGFM_28D, SM4500_H+		X		X		X		X	
Preservation Codes:		M - Hexane		N - None		O - AsNaO2		P - Na2O4S	
A - HCL		B - NaOH		C - Zn Acetate		D - Nitric Acid		E - NaHSO4	
F - MeOH		G - Amchlor		H - Ascorbic Acid		I - Ice		J - DI Water	
K - EDTA		L - EDA		Other:		T - TSP Dodecahydrate		U - Acetone	
V - MCAA		W - pH 4-5		Z - other (specify)		M - Hexane		N - None	
O - AsNaO2		P - Na2O4S		Q - Na2SO3		R - Na2S2O3		S - H2SO4	
T - TSP Dodecahydrate		U - Acetone		V - MCAA		W - pH 4-5		Z - other (specify)	
M - Hexane		N - None		O - AsNaO2		P - Na2O4S		Q - Na2SO3	
R - Na2S2O3		S - H2SO4		T - TSP Dodecahydrate		U - Acetone		V - MCAA	
W - pH 4-5		Z - other (specify)		M - Hexane		N - None		O - AsNaO2	
O - AsNaO2		P - Na2O4S		Q - Na2SO3		R - Na2S2O3		S - H2SO4	
T - TSP Dodecahydrate		U - Acetone		V - MCAA		W - pH 4-5		Z - other (specify)	
M - Hexane		N - None		O - AsNaO2		P - Na2O4S		Q - Na2SO3	
R - Na2S2O3		S - H2SO4		T - TSP Dodecahydrate		U - Acetone		V - MCAA	
W - pH 4-5		Z - other (specify)		M - Hexane		N - None		O - AsNaO2	
O - AsNaO2		P - Na2O4S		Q - Na2SO3		R - Na2S2O3		S - H2SO4	
T - TSP Dodecahydrate		U - Acetone		V - MCAA		W - pH 4-5		Z - other (specify)	
M - Hexane		N - None		O - AsNaO2		P - Na2O4S		Q - Na2SO3	
R - Na2S2O3		S - H2SO4		T - TSP Dodecahydrate		U - Acetone		V - MCAA	
W - pH 4-5		Z - other (specify)		M - Hexane		N - None		O - AsNaO2	
O - AsNaO2		P - Na2O4S		Q - Na2SO3		R - Na2S2O3		S - H2SO4	
T - TSP Dodecahydrate		U - Acetone		V - MCAA		W - pH 4-5		Z - other (specify)	
M - Hexane		N - None		O - AsNaO2		P - Na2O4S		Q - Na2SO3	
R - Na2S2O3		S - H2SO4		T - TSP Dodecahydrate		U - Acetone		V - MCAA	
W - pH 4-5		Z - other (specify)		M - Hexane		N - None		O - AsNaO2	
O - AsNaO2		P - Na2O4S		Q - Na2SO3		R - Na2S2O3		S - H2SO4	
T - TSP Dodecahydrate		U - Acetone		V - MCAA		W - pH 4-5		Z - other (specify)	



Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-175270-A-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-C-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-175270-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-A-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-C-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-175270-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-A-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-C-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-175270-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-A-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-C-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-175270-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____



**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

Parameter	COC #1		COC #2						COC #3			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-307	MW-308		MW-309
<b>Appendix III Parameters</b>													
Boron	x	x						x	x	x	x	x	7
Calcium	x	x						x	x	x	x	x	7
Chloride	x	x						x	x	x	x	x	7
Fluoride								x	x				2
pH	x	x						x	x	x	x	x	7
Sulfate	x	x						x	x	x	x	x	7
TDS	x	x						x	x	x	x	x	7
<b>Appendix IV Parameters</b>													
Antimony								x	x				2
Arsenic	x	x						x	x	x	x	x	7
Barium	x	x						x	x	x	x	x	7
Beryllium								x	x				2
Cadmium	x	x						x	x	x	x	x	7
Chromium	x	x						x	x	x	x	x	7
Cobalt	x	x						x	x	x	x	x	7
Fluoride								x	x				2
Lead	x	x						x	x	x	x	x	7
Lithium	x	x						x	x	x	x	x	7
Mercury								x	x				2
Molybdenum								x	x				2
Selenium								x	x				2
Thallium								x	x				2
Radium	x	x						x	x	x	x	x	7
<b>Field Parameters</b>													
Groundwater Elevation	x							x	x	x	x	x	6
Well Depth	x							x	x	x	x	x	6
pH (field)	x							x	x	x	x	x	6
Specific Conductance	x							x	x	x	x	x	6
Dissolved Oxygen	x							x	x	x	x	x	6
ORP	x							x	x	x	x	x	6
Temperature	x							x	x	x	x	x	6
Turbidity	x							x	x	x	x	x	6
Color	x							x	x	x	x	x	6
Odor	x							x	x	x	x	x	6

Notes: All samples are unfiltered (total).

I:\25219072.00\Data and Calculations\Tables\Sampling Details\[OGS\_CCR\_Rule\_Sampling\_2002.xls]Sheet1

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-175270-1

**Login Number: 175270**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Field Blank 250 HNO3 has MW-301, time matches FB with 2359, lid marked FB.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## C2 Assessment Monitoring, April 2020

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-177619-1  
Laboratory Sample Delivery Group: 25219072  
Client Project/Site: Ottumwa Generating Station 25219072  
Revision: 1

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
6/1/2020 8:58:23 AM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

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## Job ID: 310-177619-1

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Laboratory: Eurofins TestAmerica, Cedar Falls

### Narrative

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#### Job Narrative 310-177619-1

### Comments

REVISION: Client added total lithium to the analyte list for samples 5-8.

### Receipt

The samples were received on 3/14/2020 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.2° C.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-177619-1	MW-305A	Water	03/13/20 09:40	03/14/20 09:15	
310-177619-2	MW-310A	Water	03/13/20 10:50	03/14/20 09:15	
310-177619-3	MW-311A	Water	03/13/20 10:50	03/14/20 09:15	
310-177619-4	Field Blank	Water	03/13/20 13:30	03/14/20 09:15	
310-177619-5	MW-310	Water	03/12/20 17:40	03/14/20 09:15	
310-177619-6	MW-301	Water	03/12/20 18:45	03/14/20 09:15	
310-177619-7	MW-305	Water	03/13/20 09:05	03/14/20 09:15	
310-177619-8	MW-311	Water	03/13/20 12:50	03/14/20 09:15	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Client Sample ID: MW-305A

## Lab Sample ID: 310-177619-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	40		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.77		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	40		5.0	3.6	mg/L	5		9056A	Total/NA
Antimony	1.3		1.0	0.58	ug/L	1		6020A	Total/NA
Barium	70		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	250		200	100	ug/L	1		6020A	Total/NA
Calcium	100		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	2.4		0.50	0.091	ug/L	1		6020A	Total/NA
Iron	720		100	50	ug/L	1		6020A	Total/NA
Lead	0.68		0.50	0.27	ug/L	1		6020A	Total/NA
Lithium	14		10	2.3	ug/L	1		6020A	Total/NA
Manganese	180		10	4.0	ug/L	1		6020A	Total/NA
Molybdenum	9.0		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	2.3	J	5.0	1.0	ug/L	1		6020A	Total/NA
Cobalt	2.1		0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	15		10	2.3	ug/L	1		6020A	Dissolved
Manganese	150		10	4.0	ug/L	1		6020A	Dissolved
Total Dissolved Solids	400		30	26	mg/L	1		SM 2540C	Total/NA
pH	7.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-177619-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	140		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.7		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1200		20	14	mg/L	20		9056A	Total/NA
Barium	16		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1500		200	100	ug/L	1		6020A	Total/NA
Calcium	82		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.63		0.50	0.091	ug/L	1		6020A	Total/NA
Iron	99	J	100	50	ug/L	1		6020A	Total/NA
Lithium	250		10	2.3	ug/L	1		6020A	Total/NA
Manganese	51		10	4.0	ug/L	1		6020A	Total/NA
Molybdenum	2.6		2.0	1.1	ug/L	1		6020A	Total/NA
Cobalt	0.67		0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	250		10	2.3	ug/L	1		6020A	Dissolved
Manganese	53		10	4.0	ug/L	1		6020A	Dissolved
Total Dissolved Solids	2300		30	26	mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-177619-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	130		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	3.4		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1200		20	14	mg/L	20		9056A	Total/NA
Barium	20		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1400		200	100	ug/L	1		6020A	Total/NA
Calcium	44		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.19	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	260		10	2.3	ug/L	1		6020A	Total/NA
Manganese	20		10	4.0	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

## Client Sample ID: MW-311A (Continued)

## Lab Sample ID: 310-177619-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	1.2	J	2.0	1.1	ug/L	1		6020A	Total/NA
Cobalt	0.36	J	0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	250		10	2.3	ug/L	1		6020A	Dissolved
Manganese	20		10	4.0	ug/L	1		6020A	Dissolved
Total Dissolved Solids	2300		30	26	mg/L	1		SM 2540C	Total/NA
pH	8.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-177619-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	6.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-177619-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.32	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	46		10	2.3	ug/L	1		6020A	Total/NA
Manganese	260		10	4.0	ug/L	1		6020A	Total/NA
Cobalt	0.31	J	0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	45		10	2.3	ug/L	1		6020A	Dissolved
Manganese	250		10	4.0	ug/L	1		6020A	Dissolved

## Client Sample ID: MW-301

## Lab Sample ID: 310-177619-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.43	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	21		10	2.3	ug/L	1		6020A	Total/NA
Manganese	16		10	4.0	ug/L	1		6020A	Total/NA
Cobalt	0.32	J	0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	22		10	2.3	ug/L	1		6020A	Dissolved
Manganese	17		10	4.0	ug/L	1		6020A	Dissolved

## Client Sample ID: MW-305

## Lab Sample ID: 310-177619-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	18		0.50	0.091	ug/L	1		6020A	Total/NA
Iron	390		100	50	ug/L	1		6020A	Total/NA
Lithium	2.3	J	10	2.3	ug/L	1		6020A	Total/NA
Manganese	3200		10	4.0	ug/L	1		6020A	Total/NA
Cobalt	16		0.50	0.091	ug/L	1		6020A	Dissolved
Iron	51	J	100	50	ug/L	1		6020A	Dissolved
Manganese	3100		10	4.0	ug/L	1		6020A	Dissolved

## Client Sample ID: MW-311

## Lab Sample ID: 310-177619-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	4.7	J	10	2.3	ug/L	1		6020A	Total/NA
Manganese	20		10	4.0	ug/L	1		6020A	Total/NA
Cobalt	0.11	J	0.50	0.091	ug/L	1		6020A	Dissolved
Lithium	8.0	J	10	2.3	ug/L	1		6020A	Dissolved
Manganese	21		10	4.0	ug/L	1		6020A	Dissolved

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-177619-1**

Date Collected: 03/13/20 09:40

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	40		5.0	2.0	mg/L			03/17/20 14:52	5
Fluoride	0.77		0.50	0.23	mg/L			03/17/20 14:52	5
Sulfate	40		5.0	3.6	mg/L			03/17/20 14:52	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	1.3		1.0	0.58	ug/L		03/17/20 08:23	03/17/20 19:12	1
Arsenic	<0.88		2.0	0.88	ug/L		03/17/20 08:23	03/17/20 19:12	1
Barium	70		2.0	0.90	ug/L		03/17/20 08:23	03/17/20 19:12	1
Beryllium	<0.27		1.0	0.27	ug/L		03/17/20 08:23	03/17/20 19:12	1
Boron	250		200	100	ug/L		03/17/20 08:23	03/17/20 19:12	1
Cadmium	<0.039		0.10	0.039	ug/L		03/17/20 08:23	03/17/20 19:12	1
Calcium	100		0.50	0.19	mg/L		03/17/20 08:23	03/17/20 19:12	1
Chromium	<1.1		5.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:12	1
Cobalt	2.4		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:12	1
Iron	720		100	50	ug/L		03/17/20 08:23	03/17/20 19:12	1
Lead	0.68		0.50	0.27	ug/L		03/17/20 08:23	03/17/20 19:12	1
Lithium	14		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:12	1
Manganese	180		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:12	1
Molybdenum	9.0		2.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:12	1
Selenium	2.3 J		5.0	1.0	ug/L		03/17/20 08:23	03/17/20 19:12	1
Thallium	<0.26		1.0	0.26	ug/L		03/17/20 08:23	03/17/20 19:12	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	2.1		0.50	0.091	ug/L		03/17/20 08:25	03/17/20 20:59	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 20:59	1
Lithium	15		10	2.3	ug/L		03/17/20 08:25	03/17/20 20:59	1
Manganese	150		10	4.0	ug/L		03/17/20 08:25	03/17/20 20:59	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		03/18/20 17:52	03/19/20 10:52	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	400		30	26	mg/L			03/17/20 11:38	1
pH	7.4	HF	0.1	0.1	SU			03/14/20 11:40	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-177619-2**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		5.0	2.0	mg/L			03/17/20 15:38	5
Fluoride	1.7		0.50	0.23	mg/L			03/17/20 15:38	5
Sulfate	1200		20	14	mg/L			03/17/20 17:43	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		03/17/20 08:23	03/17/20 19:15	1
Arsenic	<0.88		2.0	0.88	ug/L		03/17/20 08:23	03/17/20 19:15	1
Barium	16		2.0	0.90	ug/L		03/17/20 08:23	03/17/20 19:15	1
Beryllium	<0.27		1.0	0.27	ug/L		03/17/20 08:23	03/17/20 19:15	1
Boron	1500		200	100	ug/L		03/17/20 08:23	03/17/20 19:15	1
Cadmium	<0.039		0.10	0.039	ug/L		03/17/20 08:23	03/17/20 19:15	1
Calcium	82		0.50	0.19	mg/L		03/17/20 08:23	03/17/20 19:15	1
Chromium	<1.1		5.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:15	1
Cobalt	0.63		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:15	1
Iron	99 J		100	50	ug/L		03/17/20 08:23	03/17/20 19:15	1
Lead	<0.27		0.50	0.27	ug/L		03/17/20 08:23	03/17/20 19:15	1
Lithium	250		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:15	1
Manganese	51		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:15	1
Molybdenum	2.6		2.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:15	1
Selenium	<1.0		5.0	1.0	ug/L		03/17/20 08:23	03/17/20 19:15	1
Thallium	<0.26		1.0	0.26	ug/L		03/17/20 08:23	03/17/20 19:15	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.67		0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:04	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 21:04	1
Lithium	250		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:04	1
Manganese	53		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:04	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		03/18/20 17:52	03/19/20 10:54	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		30	26	mg/L			03/17/20 11:38	1
pH	7.7	HF	0.1	0.1	SU			03/14/20 11:45	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-177619-3**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		5.0	2.0	mg/L			03/17/20 15:54	5
Fluoride	3.4		0.50	0.23	mg/L			03/17/20 15:54	5
Sulfate	1200		20	14	mg/L			03/17/20 17:59	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		03/17/20 08:23	03/17/20 19:18	1
Arsenic	<0.88		2.0	0.88	ug/L		03/17/20 08:23	03/17/20 19:18	1
Barium	20		2.0	0.90	ug/L		03/17/20 08:23	03/17/20 19:18	1
Beryllium	<0.27		1.0	0.27	ug/L		03/17/20 08:23	03/17/20 19:18	1
Boron	1400		200	100	ug/L		03/17/20 08:23	03/17/20 19:18	1
Cadmium	<0.039		0.10	0.039	ug/L		03/17/20 08:23	03/17/20 19:18	1
Calcium	44		0.50	0.19	mg/L		03/17/20 08:23	03/17/20 19:18	1
Chromium	<1.1		5.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:18	1
Cobalt	0.19	J	0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:18	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 19:18	1
Lead	<0.27		0.50	0.27	ug/L		03/17/20 08:23	03/17/20 19:18	1
Lithium	260		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:18	1
Manganese	20		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:18	1
Molybdenum	1.2	J	2.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:18	1
Selenium	<1.0		5.0	1.0	ug/L		03/17/20 08:23	03/17/20 19:18	1
Thallium	<0.26		1.0	0.26	ug/L		03/17/20 08:23	03/17/20 19:18	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.36	J	0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:07	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 21:07	1
Lithium	250		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:07	1
Manganese	20		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:07	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		03/18/20 17:52	03/19/20 10:56	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		30	26	mg/L			03/17/20 11:38	1
pH	8.0	HF	0.1	0.1	SU			03/14/20 11:47	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Client Sample ID: Field Blank

## Lab Sample ID: 310-177619-4

Date Collected: 03/13/20 13:30

Matrix: Water

Date Received: 03/14/20 09:15

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			03/17/20 16:10	1
Fluoride	<0.046		0.10	0.046	mg/L			03/17/20 16:10	1
Sulfate	<0.71		1.0	0.71	mg/L			03/17/20 16:10	1

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		03/17/20 08:23	03/17/20 19:20	1
Arsenic	<0.88		2.0	0.88	ug/L		03/17/20 08:23	03/17/20 19:20	1
Barium	<0.90		2.0	0.90	ug/L		03/17/20 08:23	03/17/20 19:20	1
Beryllium	<0.27		1.0	0.27	ug/L		03/17/20 08:23	03/17/20 19:20	1
Boron	<100		200	100	ug/L		03/17/20 08:23	03/17/20 19:20	1
Cadmium	<0.039		0.10	0.039	ug/L		03/17/20 08:23	03/17/20 19:20	1
Calcium	<0.19		0.50	0.19	mg/L		03/17/20 08:23	03/17/20 19:20	1
Chromium	<1.1		5.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:20	1
Cobalt	<0.091		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:20	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 19:20	1
Lead	<0.27		0.50	0.27	ug/L		03/17/20 08:23	03/17/20 19:20	1
Lithium	<2.3		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:20	1
Manganese	<4.0		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:20	1
Molybdenum	<1.1		2.0	1.1	ug/L		03/17/20 08:23	03/17/20 19:20	1
Selenium	<1.0		5.0	1.0	ug/L		03/17/20 08:23	03/17/20 19:20	1
Thallium	<0.26		1.0	0.26	ug/L		03/17/20 08:23	03/17/20 19:20	1

### Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:10	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/20/20 10:40	1
Lithium	<2.3		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:10	1
Manganese	<4.0		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:10	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		03/18/20 17:52	03/19/20 10:58	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			03/17/20 11:38	1
pH	6.4	HF	0.1	0.1	SU			03/14/20 11:50	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-310**  
 Date Collected: 03/12/20 17:40  
 Date Received: 03/14/20 09:15

**Lab Sample ID: 310-177619-5**  
 Matrix: Water

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.32	J	0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:23	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 19:23	1
Lithium	46		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:23	1
Manganese	260		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:23	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.31	J	0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:12	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 21:12	1
Lithium	45		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:12	1
Manganese	250		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:12	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

**Client Sample ID: MW-301**

**Lab Sample ID: 310-177619-6**

Date Collected: 03/12/20 18:45

Matrix: Water

Date Received: 03/14/20 09:15

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.43	J	0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:28	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 19:28	1
Lithium	21		10	2.3	ug/L		03/17/20 08:23	03/17/20 19:28	1
Manganese	16		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:28	1

## Method: 6020A - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.32	J	0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:15	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 21:15	1
Lithium	22		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:15	1
Manganese	17		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-305**

**Lab Sample ID: 310-177619-7**

Date Collected: 03/13/20 09:05

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	18		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:31	1
Iron	390		100	50	ug/L		03/17/20 08:23	03/17/20 19:31	1
Lithium	2.3	J	10	2.3	ug/L		03/17/20 08:23	03/17/20 19:31	1
Manganese	3200		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:31	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	16		0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:18	1
Iron	51	J	100	50	ug/L		03/17/20 08:25	03/17/20 21:18	1
Lithium	<2.3		10	2.3	ug/L		03/17/20 08:25	03/17/20 21:18	1
Manganese	3100		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:18	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-311**  
**Date Collected: 03/13/20 12:50**  
**Date Received: 03/14/20 09:15**

**Lab Sample ID: 310-177619-8**  
**Matrix: Water**

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 19:33	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 19:33	1
<b>Lithium</b>	<b>4.7</b>	<b>J</b>	10	2.3	ug/L		03/17/20 08:23	03/17/20 19:33	1
<b>Manganese</b>	<b>20</b>		10	4.0	ug/L		03/17/20 08:23	03/17/20 19:33	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Cobalt</b>	<b>0.11</b>	<b>J</b>	0.50	0.091	ug/L		03/17/20 08:25	03/17/20 21:20	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 21:20	1
<b>Lithium</b>	<b>8.0</b>	<b>J</b>	10	2.3	ug/L		03/17/20 08:25	03/17/20 21:20	1
<b>Manganese</b>	<b>21</b>		10	4.0	ug/L		03/17/20 08:25	03/17/20 21:20	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

## Qualifiers

### Metals

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-273199/3**  
**Matrix: Water**  
**Analysis Batch: 273199**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			03/17/20 09:26	1
Fluoride	<0.046		0.10	0.046	mg/L			03/17/20 09:26	1
Sulfate	<0.71		1.0	0.71	mg/L			03/17/20 09:26	1

**Lab Sample ID: LCS 310-273199/4**  
**Matrix: Water**  
**Analysis Batch: 273199**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.21		mg/L		92	90 - 110
Fluoride	2.00	1.88		mg/L		94	90 - 110
Sulfate	10.0	9.74		mg/L		97	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-273039/1-A**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 273039**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		03/17/20 08:23	03/17/20 18:28	1
Arsenic	<0.88		2.0	0.88	ug/L		03/17/20 08:23	03/17/20 18:28	1
Barium	<0.90		2.0	0.90	ug/L		03/17/20 08:23	03/17/20 18:28	1
Beryllium	<0.27		1.0	0.27	ug/L		03/17/20 08:23	03/17/20 18:28	1
Boron	<100		200	100	ug/L		03/17/20 08:23	03/17/20 18:28	1
Cadmium	<0.039		0.10	0.039	ug/L		03/17/20 08:23	03/17/20 18:28	1
Calcium	<0.19		0.50	0.19	mg/L		03/17/20 08:23	03/17/20 18:28	1
Chromium	<1.1		5.0	1.1	ug/L		03/17/20 08:23	03/17/20 18:28	1
Cobalt	<0.091		0.50	0.091	ug/L		03/17/20 08:23	03/17/20 18:28	1
Iron	<50		100	50	ug/L		03/17/20 08:23	03/17/20 18:28	1
Lead	<0.27		0.50	0.27	ug/L		03/17/20 08:23	03/17/20 18:28	1
Lithium	<2.3		10	2.3	ug/L		03/17/20 08:23	03/17/20 18:28	1
Manganese	<4.0		10	4.0	ug/L		03/17/20 08:23	03/17/20 18:28	1
Molybdenum	<1.1		2.0	1.1	ug/L		03/17/20 08:23	03/17/20 18:28	1
Selenium	<1.0		5.0	1.0	ug/L		03/17/20 08:23	03/17/20 18:28	1
Thallium	<0.26		1.0	0.26	ug/L		03/17/20 08:23	03/17/20 18:28	1

**Lab Sample ID: LCS 310-273039/2-A**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 273039**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	40.0	37.1		ug/L		93	80 - 120
Arsenic	80.0	77.1		ug/L		96	80 - 120
Barium	80.0	82.6		ug/L		103	80 - 120
Beryllium	40.0	43.2		ug/L		108	80 - 120
Boron	1760	1770		ug/L		101	80 - 120
Cadmium	40.0	41.3		ug/L		103	80 - 120
Calcium	4.00	3.91		mg/L		98	80 - 120

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 310-273039/2-A**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 273039**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	80.0	83.5		ug/L		104	80 - 120
Cobalt	40.0	41.2		ug/L		103	80 - 120
Iron	4000	3850		ug/L		96	80 - 120
Lead	40.0	41.0		ug/L		102	80 - 120
Lithium	200	194		ug/L		97	80 - 120
Manganese	400	410		ug/L		102	80 - 120
Molybdenum	80.0	79.8		ug/L		100	80 - 120
Selenium	80.0	76.9		ug/L		96	80 - 120
Thallium	32.0	31.4		ug/L		98	80 - 120

**Lab Sample ID: 310-177619-5 DU**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: MW-310**  
**Prep Type: Total/NA**  
**Prep Batch: 273039**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.58		<0.58		ug/L		NC	20
Arsenic	<0.88		<0.88		ug/L		NC	20
Barium	66		66.9		ug/L		2	20
Beryllium	<0.27		<0.27		ug/L		NC	20
Boron	540		548		ug/L		0.8	20
Cadmium	0.13		0.126		ug/L		2	20
Calcium	190000		184	F3	mg/L		200	20
Chromium	3.7	J	<1.1		ug/L		NC	20
Cobalt	0.32	J	0.314	J	ug/L		3	20
Iron	<50		<50		ug/L		NC	20
Lead	<0.27		<0.27		ug/L		NC	20
Lithium	46		46.3		ug/L		1	20
Manganese	260		258		ug/L		0.3	20
Molybdenum	31		30.8		ug/L		0.8	20
Selenium	4.0	J	3.99	J	ug/L		0.3	20
Thallium	<0.26		<0.26		ug/L		NC	20

**Lab Sample ID: MB 310-273040/1-A**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 273040**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		03/17/20 08:25	03/17/20 20:05	1
Iron	<50		100	50	ug/L		03/17/20 08:25	03/17/20 20:05	1
Lithium	<2.3		10	2.3	ug/L		03/17/20 08:25	03/17/20 20:05	1
Manganese	<4.0		10	4.0	ug/L		03/17/20 08:25	03/17/20 20:05	1

**Lab Sample ID: LCS 310-273040/2-A**  
**Matrix: Water**  
**Analysis Batch: 273164**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 273040**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	40.0	42.8		ug/L		107	80 - 120
Iron	4000	3990		ug/L		100	80 - 120

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-273040/2-A  
 Matrix: Water  
 Analysis Batch: 273164

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 273040

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	200	198		ug/L		99	80 - 120
Manganese	400	413		ug/L		103	80 - 120

Lab Sample ID: 310-177619-1 DU  
 Matrix: Water  
 Analysis Batch: 273164

Client Sample ID: MW-305A  
 Prep Type: Dissolved  
 Prep Batch: 273040

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cobalt	2.1		2.03		ug/L		3	20
Iron	<50		<50		ug/L		NC	20
Lithium	15		14.7		ug/L		1	20
Manganese	150		148		ug/L		0.8	20

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-273267/1-A  
 Matrix: Water  
 Analysis Batch: 273354

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 273267

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		03/18/20 17:52	03/19/20 10:03	1

Lab Sample ID: LCS 310-273267/2-A  
 Matrix: Water  
 Analysis Batch: 273354

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 273267

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.70		ug/L		102	80 - 120

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-273074/1  
 Matrix: Water  
 Analysis Batch: 273074

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			03/17/20 11:38	1

Lab Sample ID: LCS 310-273074/2  
 Matrix: Water  
 Analysis Batch: 273074

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	990		mg/L		99	90 - 110

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 310-272870/1**  
**Matrix: Water**  
**Analysis Batch: 272870**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

**Lab Sample ID: 310-177619-1 DU**  
**Matrix: Water**  
**Analysis Batch: 272870**

**Client Sample ID: MW-305A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.4	HF	7.4		SU		0.1	20

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## HPLC/IC

### Analysis Batch: 273199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	9056A	
310-177619-2	MW-310A	Total/NA	Water	9056A	
310-177619-2	MW-310A	Total/NA	Water	9056A	
310-177619-3	MW-311A	Total/NA	Water	9056A	
310-177619-3	MW-311A	Total/NA	Water	9056A	
310-177619-4	Field Blank	Total/NA	Water	9056A	
MB 310-273199/3	Method Blank	Total/NA	Water	9056A	
LCS 310-273199/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 273039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	3010A	
310-177619-2	MW-310A	Total/NA	Water	3010A	
310-177619-3	MW-311A	Total/NA	Water	3010A	
310-177619-4	Field Blank	Total/NA	Water	3010A	
310-177619-5	MW-310	Total/NA	Water	3010A	
310-177619-6	MW-301	Total/NA	Water	3010A	
310-177619-7	MW-305	Total/NA	Water	3010A	
310-177619-8	MW-311	Total/NA	Water	3010A	
MB 310-273039/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-273039/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-177619-5 DU	MW-310	Total/NA	Water	3010A	

### Prep Batch: 273040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Dissolved	Water	3010A	
310-177619-2	MW-310A	Dissolved	Water	3010A	
310-177619-3	MW-311A	Dissolved	Water	3010A	
310-177619-4	Field Blank	Dissolved	Water	3010A	
310-177619-5	MW-310	Dissolved	Water	3010A	
310-177619-6	MW-301	Dissolved	Water	3010A	
310-177619-7	MW-305	Dissolved	Water	3010A	
310-177619-8	MW-311	Dissolved	Water	3010A	
MB 310-273040/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-273040/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-177619-1 DU	MW-305A	Dissolved	Water	3010A	

### Analysis Batch: 273164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Dissolved	Water	6020A	273040
310-177619-1	MW-305A	Total/NA	Water	6020A	273039
310-177619-2	MW-310A	Dissolved	Water	6020A	273040
310-177619-2	MW-310A	Total/NA	Water	6020A	273039
310-177619-3	MW-311A	Dissolved	Water	6020A	273040
310-177619-3	MW-311A	Total/NA	Water	6020A	273039
310-177619-4	Field Blank	Dissolved	Water	6020A	273040
310-177619-4	Field Blank	Total/NA	Water	6020A	273039
310-177619-5	MW-310	Dissolved	Water	6020A	273040
310-177619-5	MW-310	Total/NA	Water	6020A	273039

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

## Metals (Continued)

### Analysis Batch: 273164 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-6	MW-301	Dissolved	Water	6020A	273040
310-177619-6	MW-301	Total/NA	Water	6020A	273039
310-177619-7	MW-305	Dissolved	Water	6020A	273040
310-177619-7	MW-305	Total/NA	Water	6020A	273039
310-177619-8	MW-311	Dissolved	Water	6020A	273040
310-177619-8	MW-311	Total/NA	Water	6020A	273039
MB 310-273039/1-A	Method Blank	Total/NA	Water	6020A	273039
MB 310-273040/1-A	Method Blank	Total/NA	Water	6020A	273040
LCS 310-273039/2-A	Lab Control Sample	Total/NA	Water	6020A	273039
LCS 310-273040/2-A	Lab Control Sample	Total/NA	Water	6020A	273040
310-177619-1 DU	MW-305A	Dissolved	Water	6020A	273040
310-177619-5 DU	MW-310	Total/NA	Water	6020A	273039

### Prep Batch: 273267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	7470A	
310-177619-2	MW-310A	Total/NA	Water	7470A	
310-177619-3	MW-311A	Total/NA	Water	7470A	
310-177619-4	Field Blank	Total/NA	Water	7470A	
MB 310-273267/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-273267/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 273354

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	7470A	273267
310-177619-2	MW-310A	Total/NA	Water	7470A	273267
310-177619-3	MW-311A	Total/NA	Water	7470A	273267
310-177619-4	Field Blank	Total/NA	Water	7470A	273267
MB 310-273267/1-A	Method Blank	Total/NA	Water	7470A	273267
LCS 310-273267/2-A	Lab Control Sample	Total/NA	Water	7470A	273267

### Analysis Batch: 273470

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-4	Field Blank	Dissolved	Water	6020A	273040

## General Chemistry

### Analysis Batch: 272870

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	SM 4500 H+ B	
310-177619-2	MW-310A	Total/NA	Water	SM 4500 H+ B	
310-177619-3	MW-311A	Total/NA	Water	SM 4500 H+ B	
310-177619-4	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-272870/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-177619-1 DU	MW-305A	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 273074

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	SM 2540C	
310-177619-2	MW-310A	Total/NA	Water	SM 2540C	
310-177619-3	MW-311A	Total/NA	Water	SM 2540C	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

## General Chemistry (Continued)

### Analysis Batch: 273074 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-4	Field Blank	Total/NA	Water	SM 2540C	
MB 310-273074/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-273074/2	Lab Control Sample	Total/NA	Water	SM 2540C	

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# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
 SDG: 25219072

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-177619-1**

**Date Collected: 03/13/20 09:40**

**Matrix: Water**

**Date Received: 03/14/20 09:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	273199	03/17/20 14:52	ACJ	TAL CF
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 20:59	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:12	SAD	TAL CF
Total/NA	Prep	7470A			273267	03/18/20 17:52	HIS	TAL CF
Total/NA	Analysis	7470A		1	273354	03/19/20 10:52	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	273074	03/17/20 11:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	272870	03/14/20 11:40	LBB	TAL CF

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-177619-2**

**Date Collected: 03/13/20 10:50**

**Matrix: Water**

**Date Received: 03/14/20 09:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	273199	03/17/20 15:38	ACJ	TAL CF
Total/NA	Analysis	9056A		20	273199	03/17/20 17:43	ACJ	TAL CF
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:04	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:15	SAD	TAL CF
Total/NA	Prep	7470A			273267	03/18/20 17:52	HIS	TAL CF
Total/NA	Analysis	7470A		1	273354	03/19/20 10:54	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	273074	03/17/20 11:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	272870	03/14/20 11:45	LBB	TAL CF

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-177619-3**

**Date Collected: 03/13/20 10:50**

**Matrix: Water**

**Date Received: 03/14/20 09:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	273199	03/17/20 15:54	ACJ	TAL CF
Total/NA	Analysis	9056A		20	273199	03/17/20 17:59	ACJ	TAL CF
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:07	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:18	SAD	TAL CF
Total/NA	Prep	7470A			273267	03/18/20 17:52	HIS	TAL CF
Total/NA	Analysis	7470A		1	273354	03/19/20 10:56	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	273074	03/17/20 11:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	272870	03/14/20 11:47	LBB	TAL CF

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

## Client Sample ID: Field Blank

Date Collected: 03/13/20 13:30

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	273199	03/17/20 16:10	ACJ	TAL CF
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:10	SAD	TAL CF
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273470	03/20/20 10:40	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:20	SAD	TAL CF
Total/NA	Prep	7470A			273267	03/18/20 17:52	HIS	TAL CF
Total/NA	Analysis	7470A		1	273354	03/19/20 10:58	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	273074	03/17/20 11:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	272870	03/14/20 11:50	LBB	TAL CF

## Client Sample ID: MW-310

Date Collected: 03/12/20 17:40

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:12	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:23	SAD	TAL CF

## Client Sample ID: MW-301

Date Collected: 03/12/20 18:45

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:15	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:28	SAD	TAL CF

## Client Sample ID: MW-305

Date Collected: 03/13/20 09:05

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:18	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:31	SAD	TAL CF

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

**Client Sample ID: MW-311**

**Lab Sample ID: 310-177619-8**

**Date Collected: 03/13/20 12:50**

**Matrix: Water**

**Date Received: 03/14/20 09:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			273040	03/17/20 08:25	HED	TAL CF
Dissolved	Analysis	6020A		1	273164	03/17/20 21:20	SAD	TAL CF
Total/NA	Prep	3010A			273039	03/17/20 08:23	HED	TAL CF
Total/NA	Analysis	6020A		1	273164	03/17/20 19:33	SAD	TAL CF

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-1  
SDG: 25219072

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





310-177619 Chain of Custody

**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>		
Client: <u>SCS</u>		
City/State: <u>Madison WI</u>	STATE: <u>WI</u>	Project: <u>Ottumwa Gen Sta</u>
<b>Receipt Information</b>		
Date/Time Received: <u>3/14/20</u> <u>0915</u>	DATE	TIME
Received By: <u>ce</u>		
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <u>SAT</u> <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
<b>Condition of Cooler/Containers</b>		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
<b>Temperature Record</b>		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: <u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C):	Corrected Temp (°C):	
• <b>Sample Container Temperature</b>		
Container(s) used:	CONTAINER 1 <u>250 HNO3 p1</u>	CONTAINER 2
Uncorrected Temp (°C):	<u>1.1</u>	
Corrected Temp (°C):	<u>1.2</u>	
<b>Exceptions Noted</b>		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
<b>Additional Comments</b>		

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<b>Client Information</b>			Sampler: <u>Adam Watson</u>			Lab PM: <u>Fredrick, Sandie</u>		
Client Contact: <u>Meghan Blodgett</u>			Phone: <u>688-224-2830</u>			E-Mail: <u>sandie.fredrick@testamericainc.com</u>		
Company: <u>SCS Engineers</u>			Due Date Requested:			Carrier Tracking No(s): <u>310-48285-14947.1</u>		
Address: <u>2830 Dairy Drive</u>			YAT Requested (days):			Page: <u>Page 1 of 1</u>		
City: <u>Madison</u>			PO #: <u>25219072</u>			Job #:		
State, Zip: <u>WI, 53718</u>			WO #: <u>31011020</u>			Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OHS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA L - EDA Z - other (specify) Other:		
Email: <u>mblodgett@scsengineers.com</u>			Project #: <u>31011020</u>			Total Number of containers		
Project Name: <u>Ottumwa Generating Station</u>			SSOW#:			Special Instructions/Note:		
Site: <u>25219072</u>								
Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, etc)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	
MW-305A	3/13/2020	940		Water	X	X	2540C Calcd, 9056A_ORGFM_28D, SM4500_H+	
MW-310A	3/13/2020	1050		Water	X	X	6020A, 7470A	
MW-311A	3/13/2020	1050		Water	X	X	903.0, 904.0	
Field Blank	3/13/2020	1350		Water	X	X		
MW-310	3/12/2020	1740		Water	X	X		
MW-301	3/12/2020	1845		Water	X	X		
MW-305	3/13/2020	905		Water	X	X		
MW-311	3/13/2020	1250		Water	X	X		
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard   <input type="checkbox"/> Flammable   <input type="checkbox"/> Skin Irritant   <input type="checkbox"/> Poison B   <input type="checkbox"/> Unknown   <input type="checkbox"/> Radiological                  Deliverable Requested: I, II, III, IV, Other (specify)</p>								
<p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>  <input type="checkbox"/> Return To Client   <input type="checkbox"/> Disposal By Lab   <input type="checkbox"/> Archive For _____ Months</p>								
<p><b>Special Instructions/QC Requirements:</b></p>								
Empty Kit Relinquished by: _____			Date: _____			Time: _____		
Relinquished by: <u>Adam Watson</u>			Date/Time: <u>3/13/2020 - 1600</u>			Company: _____		
Relinquished by: _____			Date/Time: _____			Company: _____		
Relinquished by: _____			Date/Time: _____			Company: _____		
Custody Seals Intact: _____			Custody Seal No.: _____			Cooler Temperature(s) °C and Other Remarks:		
Δ Yes Δ No								

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-305A	310-177619-A-1	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-305A	310-177619-B-1	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-305A	310-177619-D-1	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-305A	310-177619-E-1	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-A-2	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-310A	310-177619-B-2	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-D-2	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-E-2	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-A-3	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-311A	310-177619-B-3	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-D-3	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-E-3	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-A-4	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
Field Blank	310-177619-B-4	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-D-4	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-E-4	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310	310-177619-A-5	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-310	310-177619-B-5	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-301	310-177619-A-6	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-301	310-177619-B-6	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-305	310-177619-A-7	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-305	310-177619-B-7	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-311	310-177619-A-8	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-311	310-177619-B-8	Plastic 250ml - with Nitric Acid	<	_____	_____	_____

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1	COC #2	COC #3									TOTAL					
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311		MW-311A	MW-307	MW-308	MW-309	
<b>Appendix III Parameters</b>																	
Boron		x					x			x		x					4
Calcium		x					x			x		x					4
Chloride		x					x			x		x					4
Fluoride		x					x			x		x					4
pH		x					x			x		x					4
Sulfate		x					x			x		x					4
TDS		x					x			x		x					4
<b>Appendix IV Parameters</b>																	
Antimony		x					x			x		x					4
Arsenic		x					x			x		x					4
Barium		x					x			x		x					4
Beryllium		x					x			x		x					4
Cadmium		x					x			x		x					4
Chromium		x					x			x		x					4
Cobalt		x					x			x		x					4
Fluoride		x					x			x		x					4
Lead		x					x			x		x					4
Lithium		x					x			x		x					4
Mercury		x					x			x		x					4
Molybdenum		x					x			x		x					4
Selenium		x					x			x		x					4
Thallium		x					x			x		x					4
Radium		x					x			x		x					4
<b>Additional Lab Parameters</b>																	
Cobalt (filtered)	x	x					x	x		x	x	x	x				8
Iron (total)	x	x					x	x		x	x	x	x				8
Iron (filtered)	x	x					x	x		x	x	x	x				8
Manganese (total)	x	x					x	x		x	x	x	x				8
Manganese (filtered)	x	x					x	x		x	x	x	x				8
<b>Field Parameters</b>																	
Total Iron (CHEMets)	x	x					x	x		x	x	x	x				8
Ferrous Iron (CHEMets)	x	x					x	x		x	x	x	x				8
Groundwater Elevation	x	x					x	x		x	x	x	x				8
Well Depth	x	x					x	x		x	x	x	x				8
pH (field)	x	x					x	x		x	x	x	x				8
Specific Conductance	x	x					x	x		x	x	x	x				8
Dissolved Oxygen	x	x					x	x		x	x	x	x				8
ORP	x	x					x	x		x	x	x	x				8
Temperature	x	x					x	x		x	x	x	x				8
Turbidity	x	x					x	x		x	x	x	x				8
Color	x	x					x	x		x	x	x	x				8
Odor	x	x					x	x		x	x	x	x				8

Notes: All samples are unfiltered (total).

C:\Users\Fredricks\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\K342J75V\OGS\_CCR\_Rule\_Sampling\_2003.xls\Sheet1

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-177619-1

SDG Number: 25219072

**Login Number: 177619**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-177619-2  
Laboratory Sample Delivery Group: 25219072  
Client Project/Site: Ottumwa Generating Station 25219072  
Revision: 1

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
4/21/2020 11:47:22 AM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Job ID: 310-177619-2

### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

#### Job Narrative 310-177619-2

#### Comments

REVISION: Field data updated due to a client transcription error - MW-305A

#### Receipt

The samples were received on 3/14/2020 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.2° C.

#### RAD

Methods 903.0, 9315: Ra-226 Prep Batch 160-464803

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-305A (310-177619-1), MW-310A (310-177619-2), MW-311A (310-177619-3), Field Blank (310-177619-4), (LCS 160-464803/1-A), (LCSD 160-464803/2-A) and (MB 160-464803/14-A)

Methods 904.0, 9320: Ra-228 Prep Batch 160-464805

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-305A (310-177619-1), MW-310A (310-177619-2), MW-311A (310-177619-3), Field Blank (310-177619-4), (LCS 160-464805/1-A), (LCSD 160-464805/2-A) and (MB 160-464805/14-A)

Method PrecSep\_0: Radium 228 Prep batch 160-464805:

Samples 280-134569-2,5 and 310-177619-1 were reduced due to a cloudy appearance. Sample 280-134569-4 was reduced due to yellow discoloration and a cloudy appearance: MW-305A (310-177619-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep batch 160-464803:

Samples 280-134569-2,5 and 310-177619-1 were reduced due to a cloudy appearance. Sample 280-134569-4 was reduced due to yellow discoloration and a cloudy appearance: MW-305A (310-177619-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-177619-1	MW-305A	Water	03/13/20 09:40	03/14/20 09:15	
310-177619-2	MW-310A	Water	03/13/20 10:50	03/14/20 09:15	
310-177619-3	MW-311A	Water	03/13/20 10:50	03/14/20 09:15	
310-177619-4	Field Blank	Water	03/13/20 13:30	03/14/20 09:15	
310-177619-5	MW-310	Water	03/12/20 17:40	03/14/20 09:15	
310-177619-6	MW-301	Water	03/12/20 18:45	03/14/20 09:15	
310-177619-7	MW-305	Water	03/13/20 09:05	03/14/20 09:15	
310-177619-8	MW-311	Water	03/13/20 12:50	03/14/20 09:15	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16



# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Client Sample ID: MW-305A

## Lab Sample ID: 310-177619-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oxidation Reduction Potential	204.2				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	3.79				mg/L	1		Field Sampling	Total/NA
pH, Field	8.09				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	745				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.8				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	63.2				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-177619-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oxidation Reduction Potential	178.9				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	6.28				mg/L	1		Field Sampling	Total/NA
pH, Field	7.73				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3160				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.5				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	109.0				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-177619-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oxidation Reduction Potential	206				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	2.29				mg/L	1		Field Sampling	Total/NA
pH, Field	7.85				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3336				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	7.74				NTU	1		Field Sampling	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-177619-4

No Detections.

## Client Sample ID: MW-310

## Lab Sample ID: 310-177619-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ground Water Elevation	645.45				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	252.2				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.30				mg/L	1		Field Sampling	Total/NA
pH, Field	6.89				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1902				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.8				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	2.77				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-301

## Lab Sample ID: 310-177619-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ground Water Elevation	682.82				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	258.5				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	5.31				mg/L	1		Field Sampling	Total/NA
pH, Field	6.48				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	962				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	6.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.33				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Client Sample ID: MW-305

## Lab Sample ID: 310-177619-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ground Water Elevation	661.41				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	192.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.20				mg/L	1		Field Sampling	Total/NA
pH, Field	7.02				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1788				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	42.68				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311

## Lab Sample ID: 310-177619-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Ground Water Elevation	644.18				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	222.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.23				mg/L	1		Field Sampling	Total/NA
pH, Field	7.11				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	877				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	10.0				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	3.44				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-177619-1**

Date Collected: 03/13/20 09:40

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.23		0.572	0.583	1.00	0.683	pCi/L	03/18/20 11:51	04/09/20 22:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					03/18/20 11:51	04/09/20 22:33	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.735	U	0.604	0.608	1.00	0.962	pCi/L	03/18/20 12:03	04/09/20 12:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.8		40 - 110					03/18/20 12:03	04/09/20 12:42	1
Y Carrier	82.6		40 - 110					03/18/20 12:03	04/09/20 12:42	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.97		0.832	0.842	5.00	0.962	pCi/L		04/10/20 09:48	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	204.2				millivolts			03/13/20 09:40	1
Oxygen, Dissolved, Client Supplied	3.79				mg/L			03/13/20 09:40	1
pH, Field	8.09				SU			03/13/20 09:40	1
Specific Conductance, Field	745				umhos/cm			03/13/20 09:40	1
Temperature, Field	11.8				Degrees C			03/13/20 09:40	1
Turbidity, Field	63.2				NTU			03/13/20 09:40	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-177619-2**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.27		0.546	0.620	1.00	0.324	pCi/L	03/18/20 11:51	04/09/20 22:33	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.0		40 - 110					03/18/20 11:51	04/09/20 22:33	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.157	U	0.258	0.258	1.00	0.436	pCi/L	03/18/20 12:03	04/09/20 12:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.0		40 - 110					03/18/20 12:03	04/09/20 12:42	1
Y Carrier	84.5		40 - 110					03/18/20 12:03	04/09/20 12:42	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	3.43		0.604	0.672	5.00	0.436	pCi/L		04/10/20 09:48	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	178.9				millivolts			03/13/20 10:50	1
Oxygen, Dissolved, Client Supplied	6.28				mg/L			03/13/20 10:50	1
pH, Field	7.73				SU			03/13/20 10:50	1
Specific Conductance, Field	3160				umhos/cm			03/13/20 10:50	1
Temperature, Field	12.5				Degrees C			03/13/20 10:50	1
Turbidity, Field	109.0				NTU			03/13/20 10:50	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-177619-3**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.42		0.375	0.397	1.00	0.337	pCi/L	03/18/20 11:51	04/09/20 22:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		40 - 110					03/18/20 11:51	04/09/20 22:34	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0555	U	0.242	0.242	1.00	0.423	pCi/L	03/18/20 12:03	04/09/20 12:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.1		40 - 110					03/18/20 12:03	04/09/20 12:42	1
Y Carrier	86.4		40 - 110					03/18/20 12:03	04/09/20 12:42	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.47		0.446	0.465	5.00	0.423	pCi/L		04/10/20 09:48	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	206				millivolts			03/13/20 10:50	1
Oxygen, Dissolved, Client Supplied	2.29				mg/L			03/13/20 10:50	1
pH, Field	7.85				SU			03/13/20 10:50	1
Specific Conductance, Field	3336				umhos/cm			03/13/20 10:50	1
Temperature, Field	12.1				Degrees C			03/13/20 10:50	1
Turbidity, Field	7.74				NTU			03/13/20 10:50	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-177619-4**

Date Collected: 03/13/20 13:30

Matrix: Water

Date Received: 03/14/20 09:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0170	U	0.119	0.119	1.00	0.243	pCi/L	03/18/20 11:51	04/09/20 22:34	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.7		40 - 110					03/18/20 11:51	04/09/20 22:34	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.215	U	0.243	0.244	1.00	0.400	pCi/L	03/18/20 12:03	04/09/20 12:42	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.7		40 - 110					03/18/20 12:03	04/09/20 12:42	1
Y Carrier	86.0		40 - 110					03/18/20 12:03	04/09/20 12:42	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.232	U	0.271	0.271	5.00	0.400	pCi/L		04/10/20 09:48	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-310**

**Lab Sample ID: 310-177619-5**

Date Collected: 03/12/20 17:40

Matrix: Water

Date Received: 03/14/20 09:15

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	645.45				ft			03/12/20 17:40	1
Oxidation Reduction Potential	252.2				millivolts			03/12/20 17:40	1
Oxygen, Dissolved, Client Supplied	0.30				mg/L			03/12/20 17:40	1
pH, Field	6.89				SU			03/12/20 17:40	1
Specific Conductance, Field	1902				umhos/cm			03/12/20 17:40	1
Temperature, Field	12.8				Degrees C			03/12/20 17:40	1
Turbidity, Field	2.77				NTU			03/12/20 17:40	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-301**

**Lab Sample ID: 310-177619-6**

Date Collected: 03/12/20 18:45

Matrix: Water

Date Received: 03/14/20 09:15

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	682.82				ft			03/12/20 18:45	1
Oxidation Reduction Potential	258.5				millivolts			03/12/20 18:45	1
Oxygen, Dissolved, Client Supplied	5.31				mg/L			03/12/20 18:45	1
pH, Field	6.48				SU			03/12/20 18:45	1
Specific Conductance, Field	962				umhos/cm			03/12/20 18:45	1
Temperature, Field	6.9				Degrees C			03/12/20 18:45	1
Turbidity, Field	1.33				NTU			03/12/20 18:45	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-305**

**Lab Sample ID: 310-177619-7**

Date Collected: 03/13/20 09:05

Matrix: Water

Date Received: 03/14/20 09:15

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	661.41				ft			03/13/20 09:05	1
Oxidation Reduction Potential	192.6				millivolts			03/13/20 09:05	1
Oxygen, Dissolved, Client Supplied	0.20				mg/L			03/13/20 09:05	1
pH, Field	7.02				SU			03/13/20 09:05	1
Specific Conductance, Field	1788				umhos/cm			03/13/20 09:05	1
Temperature, Field	12.4				Degrees C			03/13/20 09:05	1
Turbidity, Field	42.68				NTU			03/13/20 09:05	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-311**

**Lab Sample ID: 310-177619-8**

Date Collected: 03/13/20 12:50

Matrix: Water

Date Received: 03/14/20 09:15

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	644.18				ft			03/13/20 12:50	1
Oxidation Reduction Potential	222.6				millivolts			03/13/20 12:50	1
Oxygen, Dissolved, Client Supplied	0.23				mg/L			03/13/20 12:50	1
pH, Field	7.11				SU			03/13/20 12:50	1
Specific Conductance, Field	877				umhos/cm			03/13/20 12:50	1
Temperature, Field	10.0				Degrees C			03/13/20 12:50	1
Turbidity, Field	3.44				NTU			03/13/20 12:50	1



# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-464803/14-A**  
**Matrix: Water**  
**Analysis Batch: 467274**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 464803**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.02492	U	0.179	0.179	1.00	0.347	pCi/L	03/18/20 11:51	04/09/20 22:35	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	88.4		40 - 110					03/18/20 11:51	04/09/20 22:35	1

**Lab Sample ID: LCS 160-464803/1-A**  
**Matrix: Water**  
**Analysis Batch: 467274**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 464803**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	9.755		1.26	1.00	0.307	pCi/L	86	75 - 125
<b>Carrier</b>	<b>LCS %Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	90.9		40 - 110						

**Lab Sample ID: LCSD 160-464803/2-A**  
**Matrix: Water**  
**Analysis Batch: 467274**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 464803**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	9.315		1.21	1.00	0.287	pCi/L	82	75 - 125	0.18	1
<b>Carrier</b>	<b>LCSD %Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	92.8		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-464805/14-A**  
**Matrix: Water**  
**Analysis Batch: 467271**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 464805**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.1134	U	0.229	0.229	1.00	0.392	pCi/L	03/18/20 12:03	04/09/20 12:40	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	88.4		40 - 110					03/18/20 12:03	04/09/20 12:40	1
Y Carrier	85.2		40 - 110					03/18/20 12:03	04/09/20 12:40	1

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

## Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-464805/1-A

Matrix: Water

Analysis Batch: 467296

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 464805

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
									75	125	
Radium-228	8.95	8.083		1.00	1.00	0.484	pCi/L	90	75	125	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>								
Ba Carrier	90.9		40 - 110								
Y Carrier	82.2		40 - 110								

Lab Sample ID: LCSD 160-464805/2-A

Matrix: Water

Analysis Batch: 467296

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 464805

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
									75	125	0.42	1
Radium-228	8.95	7.285		0.920	1.00	0.461	pCi/L	81	75	125	0.42	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>									
Ba Carrier	92.8		40 - 110									
Y Carrier	86.4		40 - 110									

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

## Rad

### Prep Batch: 464803

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	PrecSep-21	
310-177619-2	MW-310A	Total/NA	Water	PrecSep-21	
310-177619-3	MW-311A	Total/NA	Water	PrecSep-21	
310-177619-4	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-464803/14-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-464803/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-464803/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 464805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	PrecSep_0	
310-177619-2	MW-310A	Total/NA	Water	PrecSep_0	
310-177619-3	MW-311A	Total/NA	Water	PrecSep_0	
310-177619-4	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-464805/14-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-464805/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-464805/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

## Field Service / Mobile Lab

### Analysis Batch: 275880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-177619-1	MW-305A	Total/NA	Water	Field Sampling	
310-177619-2	MW-310A	Total/NA	Water	Field Sampling	
310-177619-3	MW-311A	Total/NA	Water	Field Sampling	
310-177619-5	MW-310	Total/NA	Water	Field Sampling	
310-177619-6	MW-301	Total/NA	Water	Field Sampling	
310-177619-7	MW-305	Total/NA	Water	Field Sampling	
310-177619-8	MW-311	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
 SDG: 25219072

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-177619-1**

Date Collected: 03/13/20 09:40

Matrix: Water

Date Received: 03/14/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			464803	03/18/20 11:51	MNH	TAL SL
Total/NA	Analysis	903.0		1	467274	04/09/20 22:33	JLW	TAL SL
Total/NA	Prep	PrecSep_0			464805	03/18/20 12:03	MNH	TAL SL
Total/NA	Analysis	904.0		1	467296	04/09/20 12:42	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	467429	04/10/20 09:48	SMP	TAL SL
Total/NA	Analysis	Field Sampling		1	275880	03/13/20 09:40	ANO	TAL CF

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-177619-2**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			464803	03/18/20 11:51	MNH	TAL SL
Total/NA	Analysis	903.0		1	467274	04/09/20 22:33	JLW	TAL SL
Total/NA	Prep	PrecSep_0			464805	03/18/20 12:03	MNH	TAL SL
Total/NA	Analysis	904.0		1	467296	04/09/20 12:42	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	467429	04/10/20 09:48	SMP	TAL SL
Total/NA	Analysis	Field Sampling		1	275880	03/13/20 10:50	ANO	TAL CF

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-177619-3**

Date Collected: 03/13/20 10:50

Matrix: Water

Date Received: 03/14/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			464803	03/18/20 11:51	MNH	TAL SL
Total/NA	Analysis	903.0		1	467274	04/09/20 22:34	JLW	TAL SL
Total/NA	Prep	PrecSep_0			464805	03/18/20 12:03	MNH	TAL SL
Total/NA	Analysis	904.0		1	467296	04/09/20 12:42	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	467429	04/10/20 09:48	SMP	TAL SL
Total/NA	Analysis	Field Sampling		1	275880	03/13/20 10:50	ANO	TAL CF

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-177619-4**

Date Collected: 03/13/20 13:30

Matrix: Water

Date Received: 03/14/20 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			464803	03/18/20 11:51	MNH	TAL SL
Total/NA	Analysis	903.0		1	467274	04/09/20 22:34	JLW	TAL SL
Total/NA	Prep	PrecSep_0			464805	03/18/20 12:03	MNH	TAL SL
Total/NA	Analysis	904.0		1	467296	04/09/20 12:42	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	467429	04/10/20 09:48	SMP	TAL SL

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Client Sample ID: MW-310

Date Collected: 03/12/20 17:40

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Field Sampling		1	275880	03/12/20 17:40	ANO	TAL CF

## Client Sample ID: MW-301

Date Collected: 03/12/20 18:45

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Field Sampling		1	275880	03/12/20 18:45	ANO	TAL CF

## Client Sample ID: MW-305

Date Collected: 03/13/20 09:05

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Field Sampling		1	275880	03/13/20 09:05	ANO	TAL CF

## Client Sample ID: MW-311

Date Collected: 03/13/20 12:50

Date Received: 03/14/20 09:15

## Lab Sample ID: 310-177619-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Field Sampling		1	275880	03/13/20 12:50	ANO	TAL CF

### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

## Laboratory: Eurofins TestAmerica, St. Louis

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	09-17-20

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Pos			
Field Sampling	Field Sampling	EPA	TAL CF
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency  
None = None  
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401  
TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



310-177619 Chain of Custody

**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>		
Client: <u>SCS</u>		
City/State: <u>Madison WI</u>	STATE: <u>WI</u>	Project: <u>Ottumwa Gen Sta</u>
<b>Receipt Information</b>		
Date/Time Received: <u>3/14/20</u> <u>0915</u>	DATE	TIME
Received By: <u>ce</u>		
Delivery Type: <input type="checkbox"/> UPS <input checked="" type="checkbox"/> FedEx <u>SAT</u> <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
<b>Condition of Cooler/Containers</b>		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
<b>Temperature Record</b>		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: <u>M</u>	Correction Factor (°C): <u>+0.1</u>	
• <b>Temp Blank Temperature</b> – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C):	Corrected Temp (°C):	
• <b>Sample Container Temperature</b>		
Container(s) used:	CONTAINER 1 <u>250 HNO3 p1</u>	CONTAINER 2
Uncorrected Temp (°C):	<u>1.1</u>	
Corrected Temp (°C):	<u>1.2</u>	
<b>Exceptions Noted</b>		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
<b>Additional Comments</b>		

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<b>Client Information</b>		Lab PM: Fredrick, Sandie		COC No: 310-48285-14947.1	
Client Contact: Meghan Blodgett		E-Mail: sandie.fredrick@testamericainc.com		Page: Page 1 of 1	
Company: SCS Engineers		Address: 2830 Dairy Drive		Carrier Tracking No(s):	
City: Madison		State, Zip: WI, 53718		Job #:	
Phone: 25219072		PO #: 25219072		Analysis Requested	
Email: mblodgett@scsengineers.com		WO #: 31011020		Preservation Codes:	
Project Name: Ottumwa Generating Station 25219072		SSOW#:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Due Date Requested:		TAT Requested (days):		Total Number of containers	
Sample Date		Sample Time		Sample Instructions/Note:	
Sample Identification		Sample Type (C=comp, G=grab)		Special Instructions/Note:	
Matrix (W=water, S=solid, O=organic, A=air)		Preservation Code:		Special Instructions/Note:	
MW-305A		940		Water	
MW-310A		1050		Water	
MW-311A		1050		Water	
Field Blank		1350		Water	
MW-310		1740		Water	
MW-301		1845		Water	
MW-305		905		Water	
MW-311		1250		Water	

Perform MS/MSD (Yes or No)  903.0, 904.0

Field Filtered Sample (Yes or No)  6020A, 7470A

2540C Calcd. 9056A\_ORGFM\_28D, SM4500\_H+

Fe, Mn, Co (Filtered)

Analysis Requested

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client  Disposal By Lab  Archive For \_\_\_\_\_ Months

Special Instructions/QC Requirements:

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_

Relinquished by: Adam Watson Date/Time: 3/13/2020 - 1600

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Custody Seals Intact:  Yes  No

Custody Seal No: \_\_\_\_\_

Method of Shipment: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: 3/14/20 0915

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Cooler Temperature(s) °C and Other Remarks:



Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-305A	310-177619-A-1	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-305A	310-177619-B-1	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-305A	310-177619-D-1	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-305A	310-177619-E-1	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-A-2	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-310A	310-177619-B-2	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-D-2	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310A	310-177619-E-2	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-A-3	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-311A	310-177619-B-3	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-D-3	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-311A	310-177619-E-3	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-A-4	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
Field Blank	310-177619-B-4	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-D-4	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
Field Blank	310-177619-E-4	Plastic 1 liter - Nitric Acid	<	_____	_____	_____
MW-310	310-177619-A-5	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-310	310-177619-B-5	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-301	310-177619-A-6	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-301	310-177619-B-6	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-305	310-177619-A-7	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-305	310-177619-B-7	Plastic 250ml - with Nitric Acid	<	_____	_____	_____
MW-311	310-177619-A-8	Plastic 250ml - w/nitric - dis	<	_____	_____	_____
MW-311	310-177619-B-8	Plastic 250ml - with Nitric Acid	<	_____	_____	_____

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1	COC #2	COC #3									TOTAL				
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311		MW-311A	MW-307	MW-308	MW-309
<b>Appendix III Parameters</b>																
Boron		x					x			x		x				4
Calcium		x					x			x		x				4
Chloride		x					x			x		x				4
Fluoride		x					x			x		x				4
pH		x					x			x		x				4
Sulfate		x					x			x		x				4
TDS		x					x			x		x				4
<b>Appendix IV Parameters</b>																
Antimony		x					x			x		x				4
Arsenic		x					x			x		x				4
Barium		x					x			x		x				4
Beryllium		x					x			x		x				4
Cadmium		x					x			x		x				4
Chromium		x					x			x		x				4
Cobalt		x					x			x		x				4
Fluoride		x					x			x		x				4
Lead		x					x			x		x				4
Lithium		x					x			x		x				4
Mercury		x					x			x		x				4
Molybdenum		x					x			x		x				4
Selenium		x					x			x		x				4
Thallium		x					x			x		x				4
Radium		x					x			x		x				4
<b>Additional Lab Parameters</b>																
Cobalt (filtered)	x	x					x	x		x	x	x				8
Iron (total)	x	x					x	x		x	x	x				8
Iron (filtered)	x	x					x	x		x	x	x				8
Manganese (total)	x	x					x	x		x	x	x				8
Manganese (filtered)	x	x					x	x		x	x	x				8
<b>Field Parameters</b>																
Total Iron (CHEMets)	x	x					x	x		x	x	x				8
Ferrous Iron (CHEMets)	x	x					x	x		x	x	x				8
Groundwater Elevation	x	x					x	x		x	x	x				8
Well Depth	x	x					x	x		x	x	x				8
pH (field)	x	x					x	x		x	x	x				8
Specific Conductance	x	x					x	x		x	x	x				8
Dissolved Oxygen	x	x					x	x		x	x	x				8
ORP	x	x					x	x		x	x	x				8
Temperature	x	x					x	x		x	x	x				8
Turbidity	x	x					x	x		x	x	x				8
Color	x	x					x	x		x	x	x				8
Odor	x	x					x	x		x	x	x				8

Notes: All samples are unfiltered (total).

C:\Users\Fredricks\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\K342J75V\OGS\_CCR\_Rule\_Sampling\_2003.xls\Sheet1

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-177619-2

SDG Number: 25219072

**Login Number: 177619**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-177619-2

SDG Number: 25219072

**Login Number: 177619**

**List Number: 2**

**Creator: Mazariegos, Leonel A**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 03/17/20 03:44 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25219072

Job ID: 310-177619-2  
SDG: 25219072

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
310-177619-1	MW-305A	85.8
310-177619-2	MW-310A	89.0
310-177619-3	MW-311A	93.1
310-177619-4	Field Blank	99.7
LCS 160-464803/1-A	Lab Control Sample	90.9
LCSD 160-464803/2-A	Lab Control Sample Dup	92.8
MB 160-464803/14-A	Method Blank	88.4

#### Tracer/Carrier Legend

Ba Carrier = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
310-177619-1	MW-305A	85.8	82.6
310-177619-2	MW-310A	89.0	84.5
310-177619-3	MW-311A	93.1	86.4
310-177619-4	Field Blank	99.7	86.0
LCS 160-464805/1-A	Lab Control Sample	90.9	82.2
LCSD 160-464805/2-A	Lab Control Sample Dup	92.8	86.4
MB 160-464805/14-A	Method Blank	88.4	85.2

#### Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072**  
**March 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	3/12/20 - 1845	682.82	6.9	6.48	5.31	962	258.5	1.33
MW-305	3/13/20 - 0905	661.41	12.4	7.02	0.20	1788	192.6	42.68
MW-305A	3/13/20 - 0940	NA	11.8	8.09	3.79	745	204.2	63.2
MW-310	3/12/20 - 1740	645.45	12.8	6.89	0.30	1902	252.2	2.77
MW-310A	3/13/20 - 1050	NA	12.5	7.73	6.28	3160	178.9	109.0
MW-311	3/13/20 - 1250	644.18	10.0	7.11	0.23	877	222.6	3.44
MW-311A	3/13/2020 - 1330	NA	12.1	7.85	2.29	3336	206	7.74

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed

Notes:  
none

Created by: KAK      Date: 5/1/2017  
 Last revision by: MDB      Date: 4/14/2020  
 Checked by: NDK      Date: 4/14/2020

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**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station - ZLDP / SCS Engineers Project No. 25220072**  
**March 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	3/12/20 - 1845	682.82	6.9	6.48	5.31	962	258.5	1.33
MW-305	3/13/20 - 0905	661.41	12.4	7.02	0.20	1788	192.6	42.68
MW-305A	3/13/20 - 0940	NA	11.8	8.09	3.73	745	204.2	63.2
MW-310	3/12/20 - 1740	645.45	12.8	6.89	0.30	1902	252.2	2.77
MW-310A	3/13/20 - 1050	NA	12.5	7.73	6.28	3160	178.9	109.0
MW-311	3/13/20 - 1250	644.18	10.0	7.11	0.23	877	222.6	3.44
MW-311A	3/13/2020 - 1330	NA	12.1	7.85	2.29	3336	206	7.74

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed

Notes:

none

Created by: KAK

Date: 5/1/2017

Last revision by: MDB

Date: 4/14/2020

Checked by: NDK

Date: 4/14/2020

\\Mad-fs01\data\Projects\25220072.00\Data and Calculations\Tables\LOGS\_CCR\_Field\_2020\_March.xlsx\GW Field Parameters



## C3 Assessment Monitoring, March 2020

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-1

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
4/22/2020 10:37:44 AM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

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## Job ID: 310-179710-1

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### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-179710-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3° C, 2.6° C and 4.5° C.

#### HPLC/IC

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-179710-1). Elevated reporting limits (RLs) are provided.

Methods 300.0, 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 310-276088 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-1	MW-301	Water	04/14/20 17:45	04/16/20 08:15	
310-179710-15	Field Blank	Water	04/14/20 23:59	04/16/20 08:15	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Client Sample ID: MW-301

## Lab Sample ID: 310-179710-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	140		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	140		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	54		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	700		200	100	ug/L	1		6020A	Total/NA
Calcium	84		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.52		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	24		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	1.2	J	2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	6.8		5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	550		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.6		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	683.25				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	176.3				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	5.14				mg/L	1		Field Sampling	Total/NA
pH, Field	6.58				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	939				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	8.7				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.87				NTU	1		Field Sampling	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-179710-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	0.40	J	1.0	0.40	mg/L	1		9056A	Total/NA
pH	6.3		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-179710-1**

Date Collected: 04/14/20 17:45

Matrix: Water

Date Received: 04/16/20 08:15

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		5.0	2.0	mg/L			04/16/20 23:42	5
Fluoride	<0.23		0.50	0.23	mg/L			04/16/20 23:42	5
Sulfate	140		5.0	3.6	mg/L			04/16/20 23:42	5

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:09	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:09	1
Barium	54		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:09	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:09	1
Boron	700		200	100	ug/L		04/17/20 08:00	04/21/20 12:09	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:09	1
Calcium	84		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:09	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:09	1
Cobalt	0.52		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:09	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:09	1
Lithium	24		10	2.3	ug/L		04/17/20 08:00	04/21/20 12:09	1
Molybdenum	1.2 J		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:09	1
Selenium	6.8		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:09	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:09	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:04	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	550		30	26	mg/L			04/16/20 09:19	1
pH	6.6		0.1	0.1	SU			04/15/20 22:06	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	683.25				ft			04/14/20 17:45	1
Oxidation Reduction Potential	176.3				millivolts			04/14/20 17:45	1
Oxygen, Dissolved, Client Supplied	5.14				mg/L			04/14/20 17:45	1
pH, Field	6.58				SU			04/14/20 17:45	1
Specific Conductance, Field	939				umhos/cm			04/14/20 17:45	1
Temperature, Field	8.7				Degrees C			04/14/20 17:45	1
Turbidity, Field	0.87				NTU			04/14/20 17:45	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-179710-15**

Date Collected: 04/14/20 23:59

Matrix: Water

Date Received: 04/16/20 08:15

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.40	J	1.0	0.40	mg/L			04/17/20 04:09	1
Fluoride	<0.046		0.10	0.046	mg/L			04/17/20 04:09	1
Sulfate	<0.71		1.0	0.71	mg/L			04/17/20 04:09	1

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 13:11	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 13:11	1
Barium	<0.90		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 13:11	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 13:11	1
Boron	<100		200	100	ug/L		04/17/20 08:00	04/21/20 13:11	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 13:11	1
Calcium	<0.19		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 13:11	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:11	1
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:11	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 13:11	1
Lithium	<2.3		10	2.3	ug/L		04/17/20 08:00	04/21/20 13:11	1
Molybdenum	<1.1		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:11	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 13:11	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 13:11	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:20	04/17/20 14:59	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			04/16/20 12:43	1
pH	6.3		0.1	0.1	SU			04/15/20 22:29	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-276088/3**  
**Matrix: Water**  
**Analysis Batch: 276088**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			04/16/20 20:04	1
Fluoride	<0.046		0.10	0.046	mg/L			04/16/20 20:04	1
Sulfate	<0.71		1.0	0.71	mg/L			04/16/20 20:04	1

**Lab Sample ID: LCS 310-276088/4**  
**Matrix: Water**  
**Analysis Batch: 276088**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.68		mg/L		97	90 - 110
Fluoride	2.00	2.15		mg/L		107	90 - 110
Sulfate	10.0	10.2		mg/L		102	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-276012/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 11:30	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 11:30	1
Barium	<0.90		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 11:30	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 11:30	1
Boron	<100		200	100	ug/L		04/17/20 08:00	04/21/20 11:30	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 11:30	1
Calcium	<0.19		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 11:30	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 11:30	1
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 11:30	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 11:30	1
Lithium	<2.3		10	2.3	ug/L		04/17/20 08:00	04/21/20 11:30	1
Molybdenum	<1.1		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 11:30	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 11:30	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 11:30	1

**Lab Sample ID: LCS 310-276012/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	40.0	38.0		ug/L		95	80 - 120
Arsenic	80.0	77.0		ug/L		96	80 - 120
Barium	80.0	80.8		ug/L		101	80 - 120
Beryllium	40.0	39.7		ug/L		99	80 - 120
Boron	1760	1750		ug/L		99	80 - 120
Cadmium	40.0	41.1		ug/L		103	80 - 120
Calcium	4.00	3.99		mg/L		100	80 - 120
Chromium	80.0	80.2		ug/L		100	80 - 120
Cobalt	40.0	40.0		ug/L		100	80 - 120

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-276012/2-A  
Matrix: Water  
Analysis Batch: 276475

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 276012

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	40.0	43.3		ug/L		108	80 - 120
Lithium	200	208		ug/L		104	80 - 120
Molybdenum	80.0	79.9		ug/L		100	80 - 120
Selenium	80.0	77.2		ug/L		97	80 - 120
Thallium	32.0	31.4		ug/L		98	80 - 120

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-275975/1-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 275975

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 13:31	1

Lab Sample ID: LCS 310-275975/2-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 275975

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.88		ug/L		113	80 - 120

Lab Sample ID: MB 310-275976/1-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:20	04/17/20 14:44	1

Lab Sample ID: LCS 310-275976/2-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.87		ug/L		112	80 - 120

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-275947/1  
Matrix: Water  
Analysis Batch: 275947

Client Sample ID: Method Blank  
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			04/16/20 09:19	1

Lab Sample ID: LCS 310-275947/2  
Matrix: Water  
Analysis Batch: 275947

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	980		mg/L		98	90 - 110

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-275971/1  
 Matrix: Water  
 Analysis Batch: 275971

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			04/16/20 12:43	1

Lab Sample ID: LCS 310-275971/2  
 Matrix: Water  
 Analysis Batch: 275971

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	966		mg/L		97	90 - 110

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-275892/24  
 Matrix: Water  
 Analysis Batch: 275892

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-179710-1 DU  
 Matrix: Water  
 Analysis Batch: 275892

Client Sample ID: MW-301  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.6		6.6		SU		0.2	20

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## HPLC/IC

### Analysis Batch: 276088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	9056A	
310-179710-15	Field Blank	Total/NA	Water	9056A	
MB 310-276088/3	Method Blank	Total/NA	Water	9056A	
LCS 310-276088/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 275975

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	7470A	
MB 310-275975/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-275975/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Prep Batch: 275976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-15	Field Blank	Total/NA	Water	7470A	
MB 310-275976/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-275976/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Prep Batch: 276012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	3010A	
310-179710-15	Field Blank	Total/NA	Water	3010A	
MB 310-276012/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Analysis Batch: 276156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	7470A	275975
310-179710-15	Field Blank	Total/NA	Water	7470A	275976
MB 310-275975/1-A	Method Blank	Total/NA	Water	7470A	275975
MB 310-275976/1-A	Method Blank	Total/NA	Water	7470A	275976
LCS 310-275975/2-A	Lab Control Sample	Total/NA	Water	7470A	275975
LCS 310-275976/2-A	Lab Control Sample	Total/NA	Water	7470A	275976

### Analysis Batch: 276475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	6020A	276012
310-179710-15	Field Blank	Total/NA	Water	6020A	276012
MB 310-276012/1-A	Method Blank	Total/NA	Water	6020A	276012
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	6020A	276012

## General Chemistry

### Analysis Batch: 275892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	SM 4500 H+ B	
310-179710-15	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-275892/24	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-179710-1 DU	MW-301	Total/NA	Water	SM 4500 H+ B	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## General Chemistry

### Analysis Batch: 275947

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	SM 2540C	
MB 310-275947/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-275947/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 275971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-15	Field Blank	Total/NA	Water	SM 2540C	
MB 310-275971/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-275971/2	Lab Control Sample	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 276362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

**Client Sample ID: MW-301**

**Date Collected: 04/14/20 17:45**

**Date Received: 04/16/20 08:15**

**Lab Sample ID: 310-179710-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/16/20 23:42	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:09	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:04	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275947	04/16/20 09:19	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:06	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 17:45	ANO	TAL CF

**Client Sample ID: Field Blank**

**Date Collected: 04/14/20 23:59**

**Date Received: 04/16/20 08:15**

**Lab Sample ID: 310-179710-15**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	276088	04/17/20 04:09	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:11	SAD	TAL CF
Total/NA	Prep	7470A			275976	04/16/20 13:20	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:59	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:29	JMH	TAL CF

## Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Eurofins TestAmerica, Cedar Falls

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

Client Information			
Client: <u>SCS Eng.</u>			
City/State: <u>Madison</u>	CITY	STATE <u>WI</u>	Project: <u>Ottumwa Generating Station</u>
Receipt Information			
Date/Time Received: <u>4-15-20</u>	DATE	TIME <u>1740</u>	Received By: <u>LAB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>N</u>	Correction Factor (°C): <u>+0.0</u>		
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>2.4</u>	Corrected Temp (°C): <u>2.4</u>		
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C

1  
2  
3  
4  
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14  
15



Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.6	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



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**Cooler/Sample Receipt and Temperature Log Form**

Client Information		
Client: <u>SCS Eng.</u>		
City/State: <u>Madison</u> <small>CITY</small>	<u>WI</u> <small>STATE</small>	Project: <u>Ottumwa Generating Station</u>
Receipt Information		
Date/Time Received: <u>4-15-20</u> <small>DATE</small>	<u>1740</u> <small>TIME</small>	Received By: <u>LAB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: <u>N</u>	Correction Factor (°C): <u>+0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>4.5</u>	Corrected Temp (°C): <u>4.5</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		



**Chain of Custody Record**

<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: [Redacted] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: [Redacted]		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carmer Tracking No(s): COC No: 310-48977-15135.1 Page: Page 1 of 2 Job #:	
Due Date Requested: TAT Requested (days): PO #: 25220072 WO #: [Redacted] Project #: 31011020 SSONW#: [Redacted]		<b>Analysis Requested</b> Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No) 903.0, 904.0 5020A, 7470A 2540C_Calcd, 9056A_ORGM_2BD, SM4500_H+	
<b>Sample Identification</b>		Total Number of Containers:	
Sample ID MW-301 MW-302 MW-303 MW-304 MW-305 MW-305a MW-306 MW-307 MW-308 MW-309 MW-310	Sample Date 4/14/20 4/14/20 4/14/20 4/13/20 4/13/20 4/14/20 4/14/20 4/14/20 4/14/20 4/13/20	Sample Time 1745 1700 1550 1705 1450 1015 1450 1140 1240 1350 1010	Matrix (W=water, S=solid, O=ore/soil, I=In-Tissue, A=Air) Water Water Water Water Water Water Water Water Water Water Water Water
Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>[Signature]</i> Relinquished by: <i>[Signature]</i> Relinquished by:		Received by: <i>[Signature]</i> Received by: Received by:	
Date/Time: 4/15/2020 1400 Date/Time: Date/Time:		Date/Time: 4-15-20 1740 Date/Time: Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	



<b>Client Information</b> Client Contact: Meghan Blodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone:  Email: mblodgett@scsengineers.com Project Name: Orlumwa Generating Station 25220072 Site:  Date Requested: TAT Requested (days): PO #: 25220072 WO #: Project #: 31011020 SSOW#:	Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com	Carrier Tracking No(s): IOCC No: 310-48977-15135.2 Page: Page 2 of 2 Job #:  <b>Analysis Requested</b>	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:  M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecalhydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Z - other (specify)	Total Number of Containers: Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers		
Sample Identification MW-310A MW-311 MW-311A FIELD BLANK			Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com	Carrier Tracking No(s): IOCC No: 310-48977-15135.2 Page: Page 2 of 2 Job #:  <b>Analysis Requested</b>	Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:  M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecalhydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Z - other (specify)	Total Number of Containers: Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers
Sample Date 4/14/20 4/13/20 4/13/20 4/14/20	Sample Time 0940 1240 0835 2359	Sample Type (C=Comp, G=grab) G G G G	Matrix (Water, Sewage, Soil, Dewatered, etc.) Water Water Water Water Water	Field Filtered Sample (Yes or No) D X D X D X D X D X D X		
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months			
Deliverable Requested: I, II, III, IV, Other (specify)			Special Instructions/QC Requirements:			
Empty Kit Relinquished by:			Method of Shipment:			
Relinquished by: <i>Meghan Blodgett</i>			Date: 4/15/20 1400			
Relinquished by:			Date/Time: 4-15-20 1740			
Relinquished by:			Date/Time:			
Relinquished by:			Date/Time:			
Custody Seals Intact: Δ Yes Δ No			Cooler Temperature(s) °C and Other Remarks:			

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072.00\Data and Calculations\Field Work Requests\OGS\_CCR\_Rule\_Sampling\_2004.xls\$Sheet1

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1 - RUSH NON-RAD		COC #2 - RUSH NON-RAD												COC #3 - NO RUSH			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309				
Appendix III Parameters	Boron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15		
	Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	TDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Appendix IV Parameters	Antimony	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Arsenic	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Barium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Beryllium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Cadmium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Cobalt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Lead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Lithium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Molybdenum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Selenium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Thallium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Radium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Additional Lab Parameters - REPORT SEPARATELY	Bicarbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
		Carbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Iron (total)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Iron (filtered)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Magnesium (total)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Manganese (total)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Manganese (filtered)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Potassium (total)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Field Parameters	Total Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Ferrous Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Groundwater Elevation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Well Depth	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	pH (field)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Specific Conductance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Dissolved Oxygen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	ORP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Temperature	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
	Turbidity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Odor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	

Notes: All samples are unfiltered (total).

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\W75MLXP2\OGS\_CCR\_Rule\_Sampling\_2004.xls]Sheet1



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-1

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072.00**  
**April 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (umhos/cm)	ORP (mV)	Turbidity
MW-301	4/14/20 - 1745	683.25	8.7	6.58	5.14	939	176.3	0.87
MW-302	4/14/20 - 1700	656.45	10.5	6.70	0.22	1971	135.6	31.1
MW-303	1/14/20 - 1550	654.08	8.9	6.98	1.94	1097	104.3	12.1
MW-304	4/13/20 - 1705	656.42	11.9	7.12	0.24	1764	-119.8	54.1
MW-305	4/13/20 - 1450	662.44	9.1	7.00	0.28	1772	6.6	21.7
MW-305A	4/14/20 - 1015	N/A	11.2	7.63	2.26	807	106.7	4.91
MW-306	4/14/20 - 1450	670.71	11.7	6.68	0.21	1158	49.7	15.7
MW-307	4/14/20 - 1140	650.66	10.6	6.76	0.69	1554	-52.9	28.9
MW-308	4/14/20 - 1240	650.09	10.9	6.90	0.28	1502	-69.1	5.12
MW-309	4/14/20 - 1350	649.19	11.2	7.21	0.16	1322	-51.5	100.1
MW-310	4/13/20 - 1010	645.91	10.3	7.00	0.22	1823	179.4	0.87
MW-310A	4/14/20 - 0940	N/A	8.8	7.85	6.39	2915	146.1	NA
MW-311	4/13/20 - 1240	646.79	8.8	6.86	0.29	912	103.4	0.44
MW-311A	4/14/20 - 0835	N/A	7.9	8.40	3.87	3027	115.8	3.19

Abbreviations: mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed

Notes:  
none

Created by: KAK      Date: 5/1/2017  
 Last revision by: LWJ      Date: 4/19/2020  
 Checked by: AJR      Date: 4/20/2020

C:\Users\Fredrick\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\OUR50TNS\OGS\_CCR\_Field\_2020\_April.xlsx\GW Field Parameters



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-2

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
4/22/2020 10:39:37 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*





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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

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## Job ID: 310-179710-2

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### Laboratory: Eurofins TestAmerica, Cedar Falls

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#### Narrative

#### Job Narrative 310-179710-2

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3° C, 2.6° C and 4.5° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-1	MW-301	Water	04/14/20 17:45	04/16/20 08:15	
310-179710-15	Field Blank	Water	04/14/20 23:59	04/16/20 08:15	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Client Sample ID: MW-301

## Lab Sample ID: 310-179710-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	50	J	100	50	ug/L	1		6020A	Total/NA
Magnesium	33000		500	100	ug/L	1		6020A	Total/NA
Manganese	19		10	4.0	ug/L	1		6020A	Total/NA
Potassium	1500		500	150	ug/L	1		6020A	Total/NA
Sodium	77000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	0.44	J	0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	16		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	150		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	150		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-179710-15

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

**Client Sample ID: MW-301**

**Lab Sample ID: 310-179710-1**

Date Collected: 04/14/20 17:45

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	50	J	100	50	ug/L		04/17/20 08:00	04/21/20 12:09	1
Magnesium	33000		500	100	ug/L		04/17/20 08:00	04/21/20 12:09	1
Manganese	19		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:09	1
Potassium	1500		500	150	ug/L		04/17/20 08:00	04/21/20 12:09	1
Sodium	77000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:09	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.44	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:51	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:51	1
Manganese	16		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:51	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	150		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	150		5.0	1.9	mg/L			04/17/20 10:32	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-179710-15**

**Date Collected: 04/14/20 23:59**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:11	1
Magnesium	<100		500	100	ug/L		04/17/20 08:00	04/21/20 13:11	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:11	1
Potassium	<150		500	150	ug/L		04/17/20 08:00	04/21/20 13:11	1
Sodium	<520		1000	520	ug/L		04/17/20 08:00	04/21/20 13:11	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 15:29	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 15:29	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 15:29	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Qualifiers

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-276012/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 11:30	1
Magnesium	<100		500	100	ug/L		04/17/20 08:00	04/21/20 11:30	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 11:30	1
Potassium	<150		500	150	ug/L		04/17/20 08:00	04/21/20 11:30	1
Sodium	<520		1000	520	ug/L		04/17/20 08:00	04/21/20 11:30	1

**Lab Sample ID: LCS 310-276012/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Iron	4000	4040		ug/L		101	80 - 120
Magnesium	4000	4320		ug/L		108	80 - 120
Manganese	400	418		ug/L		105	80 - 120
Potassium	4000	4090		ug/L		102	80 - 120
Sodium	4000	3990		ug/L		100	80 - 120

**Lab Sample ID: MB 310-276015/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276015**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:45	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:45	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:45	1

**Lab Sample ID: LCS 310-276015/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276015**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Cobalt	40.0	40.6		ug/L		102	80 - 120
Iron	4000	4040		ug/L		101	80 - 120
Manganese	400	427		ug/L		107	80 - 120

**Lab Sample ID: 310-179710-1 MS**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: MW-301**  
**Prep Type: Dissolved**  
**Prep Batch: 276015**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Cobalt	0.44	J	40.0	39.7		ug/L		98	75 - 125
Iron	<50		4000	4210		ug/L		105	75 - 125
Manganese	16		400	439		ug/L		106	75 - 125

**Lab Sample ID: 310-179710-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: MW-301**  
**Prep Type: Dissolved**  
**Prep Batch: 276015**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Cobalt	0.44	J	40.0	39.6		ug/L		98	75 - 125	0	20

Eurofins TestAmerica, Cedar Falls



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-179710-1 MSD  
 Matrix: Water  
 Analysis Batch: 276475

Client Sample ID: MW-301  
 Prep Type: Dissolved  
 Prep Batch: 276015

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Iron	<50		4000	4140		ug/L		104	75 - 125	2	20
Manganese	16		400	433		ug/L		104	75 - 125	1	20

## Method: 2320B - Alkalinity (Low Level)

Lab Sample ID: MB 310-276070/1  
 Matrix: Water  
 Analysis Batch: 276070

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 09:18	1

Lab Sample ID: LCS 310-276070/2  
 Matrix: Water  
 Analysis Batch: 276070

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3	1000	1010		mg/L		101	90 - 110

## Method: SM 2320B - Alkalinity

Lab Sample ID: MB 310-276083/1  
 Matrix: Water  
 Analysis Batch: 276083

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1

Lab Sample ID: LCS 310-276083/2  
 Matrix: Water  
 Analysis Batch: 276083

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3	1000	946		mg/L		95	90 - 110

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Metals

### Prep Batch: 276012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	3010A	
310-179710-15	Field Blank	Total/NA	Water	3010A	
MB 310-276012/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Prep Batch: 276015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Dissolved	Water	3010A	
310-179710-15	Field Blank	Dissolved	Water	3010A	
MB 310-276015/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276015/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-179710-1 MS	MW-301	Dissolved	Water	3010A	
310-179710-1 MSD	MW-301	Dissolved	Water	3010A	

### Analysis Batch: 276475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Dissolved	Water	6020A	276015
310-179710-1	MW-301	Total/NA	Water	6020A	276012
310-179710-15	Field Blank	Dissolved	Water	6020A	276015
310-179710-15	Field Blank	Total/NA	Water	6020A	276012
MB 310-276012/1-A	Method Blank	Total/NA	Water	6020A	276012
MB 310-276015/1-A	Method Blank	Total/NA	Water	6020A	276015
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	6020A	276012
LCS 310-276015/2-A	Lab Control Sample	Total/NA	Water	6020A	276015
310-179710-1 MS	MW-301	Dissolved	Water	6020A	276015
310-179710-1 MSD	MW-301	Dissolved	Water	6020A	276015

## General Chemistry

### Analysis Batch: 276070

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-15	Field Blank	Total/NA	Water	2320B	
MB 310-276070/1	Method Blank	Total/NA	Water	2320B	
LCS 310-276070/2	Lab Control Sample	Total/NA	Water	2320B	

### Analysis Batch: 276083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	SM 2320B	
MB 310-276083/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-276083/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Client Sample ID: MW-301

Date Collected: 04/14/20 17:45

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 13:51	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:09	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

## Client Sample ID: Field Blank

Date Collected: 04/14/20 23:59

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-15

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 15:29	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:11	SAD	TAL CF
Total/NA	Analysis	2320B		1	276070	04/17/20 09:18	WJF	TAL CF

### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-2

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
2320B	Alkalinity (Low Level)	SM	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

#### Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

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Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

**Client Information**

Client: SCS Eng.  
 City/State: Madison CITY WI STATE Project: Ottumwa Generating Station

**Receipt Information**

Date/Time Received: 4-15-20 DATE 1740 TIME Received By: LAB  
 Delivery Type:  UPS  FedEx  FedEx Ground  US Mail  Spee-Dee  
 Lab Courier  Lab Field Services  Client Drop-off  Other: \_\_\_\_\_

**Condition of Cooler/Containers**

Sample(s) received in Cooler?  Yes  No If yes: Cooler ID: \_\_\_\_\_  
 Multiple Coolers?  Yes  No If yes: Cooler # 1 of 3  
 Cooler Custody Seals Present?  Yes  No If yes: Cooler custody seals intact?  Yes  No  
 Sample Custody Seals Present?  Yes  No If yes: Sample custody seals intact?  Yes  No  
 Trip Blank Present?  Yes  No If yes: Which VOA samples are in cooler? ↓

**Temperature Record**

Coolant:  Wet ice  Blue ice  Dry ice  Other: \_\_\_\_\_  NONE  
 Thermometer ID: N Correction Factor (°C): +0.0  
 • Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature  
 Uncorrected Temp (°C): 2.4 Corrected Temp (°C): 2.4

**Sample Container Temperature**

Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		

**Exceptions Noted**

1) If temperature exceeds criteria, was sample(s) received same day of sampling?  Yes  No  
 a) If yes: Is there evidence that the chilling process began?  Yes  No  
 2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)  Yes  No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

**Additional Comments**

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Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information		
Client: <u>SCS Eng.</u>		
City/State: <u>Madison</u> <small>CITY</small>	<u>WI</u> <small>STATE</small>	Project: <u>Ottumwa Generating Station</u>
Receipt Information		
Date/Time Received: <u>4-15-20</u> <small>DATE</small>	<u>1740</u> <small>TIME</small>	Received By: <u>LAB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: <u>N</u>	Correction Factor (°C): <u>+0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>4.5</u>	Corrected Temp (°C): <u>4.5</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		

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**Chain of Custody Record**

<b>Client Information</b>		Sampler: <u>Louise Jennings</u>		Lab PM: <u>Fredrick, Sandie</u>		Carrier Tracking No(s):		COC No: <u>310-48977-15135.1</u>	
Client Contact: Meghan Bloodgett		Phone: <u>608-509-8245</u>		E-Mail: <u>sandie.fredrick@testamericainc.com</u>		Page 1 of 2		Job #:	
Company: SCS Engineers		Address: 2830 Dairy Drive		City: Madison		State, Zip: WI, 53718		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Project Name: Ottumwa Generating Station 25220072		PO #: <u>25220072</u>		WO #: <u>Standard</u>		Project #: <u>31011020</u>		Special Instructions/Note:	
Site:		Due Date Requested:		TAT Requested (days):		Field Filtered Sample (Yes or No)		Total Number of Containers	
Sample Identification		Sample Date		Sample Time		Sample Type (C=comp, G=grab)		Matrix (W=water, S=solid, O=soil, A=air)	
MW-301		4/14/20		1745		G		Water	
MW-302		4/14/20		1700		G		Water	
MW-303		4/14/20		1550		G		Water	
MW-304		4/13/20		1705		G		Water	
MW-305		4/13/20		1450		G		Water	
MW-305a		4/14/20		1015		G		Water	
MW-306		4/14/20		1450		G		Water	
MW-307		4/14/20		1140		G		Water	
MW-308		4/14/20		1240		G		Water	
MW-309		4/14/20		1350		G		Water	
MW-310		4/13/20		1010		G		Water	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Date: <u>4/15/2020</u>		Time: <u>1400</u>		Company: <u>SCS</u>		Received by: <u>Judrey Buder</u>	
Deliverable Requested: I, II, III, IV, Other (specify)		Date: <u>4/15/2020</u>		Time: <u>1740</u>		Company: <u>SCS</u>		Received by: <u>Judrey Buder</u>	
Empty Kit Relinquished by:		Date: <u>4/15/2020</u>		Time: <u>1400</u>		Company: <u>SCS</u>		Received by: <u>Judrey Buder</u>	
Custody Seals Intact: Δ Yes Δ No		Date: <u>4/15/2020</u>		Time: <u>1400</u>		Company: <u>SCS</u>		Received by: <u>Judrey Buder</u>	
Custody Seal No.:		Date: <u>4/15/2020</u>		Time: <u>1400</u>		Company: <u>SCS</u>		Received by: <u>Judrey Buder</u>	

**Chain of Custody Record**

<b>Client Information</b>		Sampler: <i>Louise Jennings</i>		Lab PM: Fredrick, Sandie		Carrier Tracking No(s):		IOC No: 310-48977-15135.2	
Client Contact: Meghan Blodgett		Phone: <i>608-509-8245</i>		E-Mail: sandie.fredrick@testamericainc.com				Page: Page 2 of 2	
Company: SCS Engineers								Job #:	
Address: 2830 Dairy Drive		Due Date Requested:		Analysis Requested				Preservation Codes:	
City: Madison		TAT Requested (days):						A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
State, Zip: WI, 53718		PO #: 25220072		Standard				M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone:		WO #: 31011020						Total Number of Containers	
Email: mblodgett@scsengineers.com		Project #: 31011020						Special Instructions/Note:	
Project Name: Orlumwa Generating Station 25220072		SSOW#: 31011020						Please refer to enclosed Table for correct grouping of wells on COCs	
Site:								This is for 3 coolers	
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Water, Swab, Dermal, etc.)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C_Calcd, 9056A_ORGM_28D, SM4500_H+	D	N
MW-310A	4/14/20	0940	G	Water	X	X	X	X	X
MW-311	4/13/20	1240	G	Water	X	X	X	X	X
MW-311A	4/13/20	0835	G	Water	X	X	X	X	X
FIELD BLANK	4/14/20	2359	G	Water	X	X	X	X	X
<p><b>Possible Hazard Identification</b>  <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological</p> <p>Deliverable Requested: I, II, III, IV, Other (specify)</p> <p>Empty Kit Relinquished by: _____ Date: _____</p> <p>Relinquished by: <i>Louise Jennings</i> Date/Time: 4/15/20 1400 Company: SCS</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Relinquished by: _____ Date/Time: _____ Company: _____</p> <p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.: _____</p> <p>Cooler Temperature(s) °C and Other Remarks: _____</p>									



Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

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Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1 - RUSH NON-RAD		COC #2 - RUSH NON-RAD										COC #3 - NO RUSH			TOTAL
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309	
Appendix III Parameters	Boron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	TDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Antimony	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Arsenic	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Barium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Appendix IV Parameters	Beryllium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Cadmium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Cobalt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Lead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Lithium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Molybdenum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Additional Lab Parameters - REPORT SEPARATELY	Selenium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Thallium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Radium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Bicarbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Carbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Cobalt (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Iron (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Iron (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Magnesium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Manganese (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Field Parameters	Manganese (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Potassium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Sodium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Total Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Ferrous Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Groundwater Elevation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Well Depth	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	pH (field)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Specific Conductance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
	Dissolved Oxygen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Temperature	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Turbidity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Color	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	
Odor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15	

Notes: All samples are unfiltered (total).

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# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-2

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-6

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
5/18/2020 10:57:44 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**Total Access**

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*





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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Job ID: 310-179710-6

### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

#### Job Narrative 310-179710-6

#### Receipt

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved, and where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3°C, 2.6°C and 4.5°C

#### Department Gas Flow Proportional Counter

Method 903.0: Radium-226 Prep Batch 160-468451: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with preparation batch 160-468451. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were created to demonstrate batch precision

Method 903.0: Radium-226 Prep Batch 160-468451: The following samples contained visible sediment: MW-302 (310-179710-2), MW-303 (310-179710-3), MW-304 (310-179710-4), MW-305 (310-179710-5) and MW-305A (310-179710-6)

Samples 310-179710-2 and 240-129036-10 were reduced to 500ml because the samples were opaque. Samples 240-129036-9,-11,-12,-13,-16,-17, 240-129039-6, and 310-179710-3,-4,-5,-6 were reduced to 750ml because the samples were cloudy and discolored

Method 903.0: Radium 226 Prep Batch 160-468932: Samples 310-179710-4 & 10 were reduced due to a cloudy appearance. Sample 310-179710-7 was reduced due to yellow discoloration: MW-304 (310-179710-4) and MW-306 (310-179710-7) A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precisio

Method 903.0: Radium-226 Prep Batch 160-468451 / 160-468932

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-302 (310-179710-2), MW-305A (310-179710-6), (LCS 160-468451/1-A), (LCSD 160-468451/2-A) and (MB 160-468451/23-A, MW-303 (310-179710-3), MW-304 (310-179710-4), MW-305 (310-179710-5), MW-306 (310-179710-7), MW-310 (310-179710-11), MW-310A (310-179710-12), MW-311 (310-179710-13), MW-311A (310-179710-14), (LCS 160-468932/1-A), (LCSD 160-468932/2-A) and (MB 160-468932/21-A

Method 904.0: Radium-226 Prep Batch 160-468451: The following samples contained visible sediment: MW-302 (310-179710-2), MW-303 (310-179710-3), MW-304 (310-179710-4), MW-305 (310-179710-5) and MW-305A (310-179710-6)

Samples 310-179710-2 and 240-129036-10 were reduced to 500ml because the samples were opaque. Samples 240-129036-9,-11,-12,-13,-16,-17, 240-129039-6, and 310-179710-3,-4,-5,-6 were reduced to 750ml because the samples were cloudy and discolored

Method 904.0: Radium-228 Prep Batch 160-468454: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with preparation batch 160-468454. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were created to demonstrate batch precision

Method 904.0: Radium 228 Prep Batch 160-468933: Samples 310-179710-4 & 10 were reduced due to a cloudy appearance. Sample 310-179710-7 was reduced due to yellow discoloration: MW-304 (310-179710-4) and MW-306 (310-179710-7) A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precisio

Method 904.0: Ra-228 Prep Batch 160-468454 The detection goal was not met for the following samples due to the presence of matrix interferences: MW-302 (310-179710-2). Analytical results are reported with the detection limit achieved. See Prep NCM 160-19441

Method 904.0: Ra-228 Prep Batch 160-468454 / 160-468933

# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

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## Job ID: 310-179710-6 (Continued)

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### Laboratory: Eurofins TestAmerica, Cedar Falls (Continued)

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-302 (310-179710-2), MW-305A (310-179710-6), (LCS 160-468454/1-A), (LCSD 160-468454/2-A) and (MB 160-468454/23, MW-303 (310-179710-3), MW-304 (310-179710-4), MW-305 (310-179710-5), MW-306 (310-179710-7), MW-310 (310-179710-11), MW-310A (310-179710-12), MW-311 (310-179710-13), MW-311A (310-179710-14), (LCS 160-468933/1-A), (LCSD 160-468933/2-A) and (MB 160-468933/21-A

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

### Department Rad

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-2	MW-302	Water	04/14/20 17:00	04/16/20 08:15	
310-179710-3	MW-303	Water	04/14/20 15:50	04/16/20 08:15	
310-179710-4	MW-304	Water	04/13/20 17:05	04/16/20 08:15	
310-179710-5	MW-305	Water	04/13/20 14:50	04/16/20 08:15	
310-179710-6	MW-305A	Water	04/14/20 10:15	04/16/20 08:15	
310-179710-7	MW-306	Water	04/14/20 14:50	04/16/20 08:15	
310-179710-11	MW-310	Water	04/13/20 10:10	04/16/20 08:15	
310-179710-12	MW-310A	Water	04/14/20 09:40	04/16/20 08:15	
310-179710-13	MW-311	Water	04/13/20 12:40	04/16/20 08:15	
310-179710-14	MW-311A	Water	04/13/20 08:35	04/16/20 08:15	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

No Detections.

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

No Detections.

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

No Detections.

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

No Detections.

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-179710-6**

No Detections.

**Client Sample ID: MW-306**

**Lab Sample ID: 310-179710-7**

No Detections.

**Client Sample ID: MW-310**

**Lab Sample ID: 310-179710-11**

No Detections.

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-179710-12**

No Detections.

**Client Sample ID: MW-311**

**Lab Sample ID: 310-179710-13**

No Detections.

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

Date Collected: 04/14/20 17:00

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.499		0.268	0.272	1.00	0.319	pCi/L	04/21/20 13:39	05/14/20 11:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.4		40 - 110					04/21/20 13:39	05/14/20 11:19	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.759	U G	0.675	0.679	1.00	1.09	pCi/L	04/21/20 13:39	05/11/20 16:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.4		40 - 110					04/21/20 13:39	05/11/20 16:05	1
Y Carrier	84.5		40 - 110					04/21/20 13:39	05/11/20 16:05	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.26		0.726	0.731	5.00	1.09	pCi/L		05/15/20 07:55	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

Date Collected: 04/14/20 15:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.149	U	0.114	0.115	1.00	0.167	pCi/L	04/26/20 17:31	05/18/20 04:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.7		40 - 110					04/26/20 17:31	05/18/20 04:29	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0801	U	0.268	0.269	1.00	0.466	pCi/L	04/26/20 17:49	05/13/20 07:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.7		40 - 110					04/26/20 17:49	05/13/20 07:52	1
Y Carrier	87.5		40 - 110					04/26/20 17:49	05/13/20 07:52	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.229	U	0.291	0.293	5.00	0.466	pCi/L		05/18/20 10:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

Date Collected: 04/13/20 17:05

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>1.20</b>		0.346	0.362	1.00	0.303	pCi/L	04/26/20 17:31	05/18/20 04:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.2		40 - 110					04/26/20 17:31	05/18/20 04:29	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>1.26</b>		0.581	0.592	1.00	0.840	pCi/L	04/26/20 17:49	05/13/20 07:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.2		40 - 110					04/26/20 17:49	05/13/20 07:52	1
Y Carrier	87.1		40 - 110					04/26/20 17:49	05/13/20 07:52	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 226 and 228</b>	<b>2.46</b>		0.676	0.694	5.00	0.840	pCi/L		05/18/20 10:15	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

Date Collected: 04/13/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.420</b>		0.146	0.151	1.00	0.140	pCi/L	04/26/20 17:31	05/18/20 04:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.2		40 - 110					04/26/20 17:31	05/18/20 04:29	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.489</b>		0.288	0.292	1.00	0.436	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.2		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	84.1		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 226 and 228</b>	<b>0.909</b>		0.323	0.329	5.00	0.436	pCi/L		05/18/20 10:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-179710-6**

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.03		0.256	0.272	1.00	0.196	pCi/L	04/21/20 13:39	05/14/20 11:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					04/21/20 13:39	05/14/20 11:19	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.230	U	0.337	0.338	1.00	0.566	pCi/L	04/21/20 13:39	05/11/20 16:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					04/21/20 13:39	05/11/20 16:05	1
Y Carrier	84.5		40 - 110					04/21/20 13:39	05/11/20 16:05	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	1.26		0.423	0.434	5.00	0.566	pCi/L		05/15/20 07:55	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Client Sample ID: MW-306

## Lab Sample ID: 310-179710-7

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

### Method: 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0738	U	0.109	0.109	1.00	0.187	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	61.9		40 - 110					04/26/20 17:31	05/18/20 04:30	1

### Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.118	U	0.398	0.398	1.00	0.738	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	61.9		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	86.0		40 - 110					04/26/20 17:49	05/13/20 07:53	1

### Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.0738	U	0.413	0.413	5.00	0.738	pCi/L		05/18/20 10:15	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-310**  
**Date Collected: 04/13/20 10:10**  
**Date Received: 04/16/20 08:15**

**Lab Sample ID: 310-179710-11**  
**Matrix: Water**

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0494	U	0.103	0.103	1.00	0.182	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		40 - 110					04/26/20 17:31	05/18/20 04:30	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.222	U	0.250	0.251	1.00	0.411	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.8		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	84.1		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.271	U	0.270	0.271	5.00	0.411	pCi/L		05/18/20 10:15	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-179710-12**

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>3.48</b>		0.357	0.475	1.00	0.116	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.8		40 - 110					04/26/20 17:31	05/18/20 04:30	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.418</b>		0.243	0.246	1.00	0.367	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.8		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	90.5		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 226 and 228</b>	<b>3.90</b>		0.432	0.535	5.00	0.367	pCi/L		05/18/20 10:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-311**

**Lab Sample ID: 310-179710-13**

Date Collected: 04/13/20 12:40

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0742	U	0.0889	0.0891	1.00	0.146	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.4		40 - 110					04/26/20 17:31	05/18/20 04:30	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0963	U	0.222	0.222	1.00	0.381	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.4		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	90.8		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.170	U	0.239	0.239	5.00	0.381	pCi/L		05/18/20 10:15	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

Date Collected: 04/13/20 08:35

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.10		0.284	0.341	1.00	0.139	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		40 - 110					04/26/20 17:31	05/18/20 04:30	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.214	U	0.217	0.218	1.00	0.352	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.7		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	82.6		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	2.31		0.357	0.405	5.00	0.352	pCi/L		05/18/20 10:15	1



# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Qualifiers

### Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)



# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-468451/23-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.04590	U	0.0985	0.0985	1.00	0.181	pCi/L	04/21/20 13:39	05/14/20 11:19	1
Carrier	MB	MB	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier	40 - 110							
Ba Carrier	97.0				04/21/20 13:39	05/14/20 11:19	1			

**Lab Sample ID: LCS 160-468451/1-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	15.1	13.34		1.48	1.00	0.146	pCi/L	88	75 - 125
Carrier	LCS	LCS	Limits		Prepared	Analyzed	Dil Fac		
Ba Carrier	%Yield	Qualifier	40 - 110						
Ba Carrier	96.6								

**Lab Sample ID: LCSD 160-468451/2-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	15.1	11.93		1.35	1.00	0.163	pCi/L	79	75 - 125	0.50	1
Carrier	LCSD	LCSD	Limits		Prepared	Analyzed	Dil Fac				
Ba Carrier	%Yield	Qualifier	40 - 110								
Ba Carrier	96.0										

**Lab Sample ID: MB 160-468932/21-A**  
**Matrix: Water**  
**Analysis Batch: 470653**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468932**

Analyte	MB	MB	Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	-0.0009617	U	0.0638	0.0638	1.00	0.134	pCi/L	04/26/20 17:31	05/18/20 06:37	1
Carrier	MB	MB	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier	40 - 110							
Ba Carrier	83.5				04/26/20 17:31	05/18/20 06:37	1			

**Lab Sample ID: LCS 160-468932/1-A**  
**Matrix: Water**  
**Analysis Batch: 470653**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468932**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	10.45		1.16	1.00	0.168	pCi/L	92	75 - 125

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-468932/1-A  
 Matrix: Water  
 Analysis Batch: 470653

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 468932

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	73.8		40 - 110

Lab Sample ID: LCSD 160-468932/2-A  
 Matrix: Water  
 Analysis Batch: 470653

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 468932

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.3	10.46		1.15	1.00	0.150	pCi/L	92	75 - 125	0.01	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	79.3		40 - 110

## Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-468454/23-A  
 Matrix: Water  
 Analysis Batch: 469973

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 468454

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1479	U	0.287	0.287	1.00	0.548	pCi/L	04/21/20 13:39	05/11/20 16:05	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		40 - 110	04/21/20 13:39	05/11/20 16:05	1
Y Carrier	85.2		40 - 110	04/21/20 13:39	05/11/20 16:05	1

Lab Sample ID: LCS 160-468454/1-A  
 Matrix: Water  
 Analysis Batch: 469997

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 468454

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	11.8	11.66		1.45	1.00	0.624	pCi/L	99	75 - 125

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	96.6		40 - 110
Y Carrier	75.5		40 - 110

Lab Sample ID: LCSD 160-468454/2-A  
 Matrix: Water  
 Analysis Batch: 469997

Client Sample ID: Lab Control Sample Dup  
 Prep Type: Total/NA  
 Prep Batch: 468454

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	11.8	10.53		1.33	1.00	0.594	pCi/L	89	75 - 125	0.41	1

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCSD 160-468454/2-A**  
**Matrix: Water**  
**Analysis Batch: 469997**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468454**

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	96.0		40 - 110
Y Carrier	80.0		40 - 110

**Lab Sample ID: MB 160-468933/21-A**  
**Matrix: Water**  
**Analysis Batch: 470297**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.2426	U	0.273	0.274	1.00	0.449	pCi/L	04/26/20 17:49	05/13/20 07:56	1

Carrier	MB		Limits	Prepared	Analyzed	Dil Fac
	%Yield	Qualifier				
Ba Carrier	83.5		40 - 110	04/26/20 17:49	05/13/20 07:56	1
Y Carrier	83.4		40 - 110	04/26/20 17:49	05/13/20 07:56	1

**Lab Sample ID: LCS 160-468933/1-A**  
**Matrix: Water**  
**Analysis Batch: 470272**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits

Carrier	LCS		Limits
	%Yield	Qualifier	
Ba Carrier	73.8		40 - 110
Y Carrier	89.7		40 - 110

**Lab Sample ID: LCSD 160-468933/2-A**  
**Matrix: Water**  
**Analysis Batch: 470272**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	79.3		40 - 110
Y Carrier	88.2		40 - 110

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Rad

### Prep Batch: 468451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	PrecSep-21	
310-179710-6	MW-305A	Total/NA	Water	PrecSep-21	
MB 160-468451/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-468451/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-468451/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 468454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	PrecSep_0	
310-179710-6	MW-305A	Total/NA	Water	PrecSep_0	
MB 160-468454/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-468454/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-468454/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

### Prep Batch: 468932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-3	MW-303	Total/NA	Water	PrecSep-21	
310-179710-4	MW-304	Total/NA	Water	PrecSep-21	
310-179710-5	MW-305	Total/NA	Water	PrecSep-21	
310-179710-7	MW-306	Total/NA	Water	PrecSep-21	
310-179710-11	MW-310	Total/NA	Water	PrecSep-21	
310-179710-12	MW-310A	Total/NA	Water	PrecSep-21	
310-179710-13	MW-311	Total/NA	Water	PrecSep-21	
310-179710-14	MW-311A	Total/NA	Water	PrecSep-21	
MB 160-468932/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-468932/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-468932/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 468933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-3	MW-303	Total/NA	Water	PrecSep_0	
310-179710-4	MW-304	Total/NA	Water	PrecSep_0	
310-179710-5	MW-305	Total/NA	Water	PrecSep_0	
310-179710-7	MW-306	Total/NA	Water	PrecSep_0	
310-179710-11	MW-310	Total/NA	Water	PrecSep_0	
310-179710-12	MW-310A	Total/NA	Water	PrecSep_0	
310-179710-13	MW-311	Total/NA	Water	PrecSep_0	
310-179710-14	MW-311A	Total/NA	Water	PrecSep_0	
MB 160-468933/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-468933/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-468933/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Client Sample ID: MW-302

Date Collected: 04/14/20 17:00

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468451	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	903.0		1	470398	05/14/20 11:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468454	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	904.0		1	469973	05/11/20 16:05	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470557	05/15/20 07:55	SMP	TAL SL

## Client Sample ID: MW-303

Date Collected: 04/14/20 15:50

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:29	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:52	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

## Client Sample ID: MW-304

Date Collected: 04/13/20 17:05

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:29	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:52	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

## Client Sample ID: MW-305

Date Collected: 04/13/20 14:50

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:29	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Client Sample ID: MW-305A

Lab Sample ID: 310-179710-6

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468451	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	903.0		1	470398	05/14/20 11:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468454	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	904.0		1	469973	05/11/20 16:05	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470557	05/15/20 07:55	SMP	TAL SL

## Client Sample ID: MW-306

Lab Sample ID: 310-179710-7

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

## Client Sample ID: MW-310

Lab Sample ID: 310-179710-11

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

## Client Sample ID: MW-310A

Lab Sample ID: 310-179710-12

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Client Sample ID: MW-311

Date Collected: 04/13/20 12:40

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-13

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

## Client Sample ID: MW-311A

Date Collected: 04/13/20 08:35

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20



# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency  
None = None  
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566





Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type:	<input type="checkbox"/> UPS	<input type="checkbox"/> FedEx	<input type="checkbox"/> FedEx Ground
	<input checked="" type="checkbox"/> Lab Courier	<input type="checkbox"/> Lab Field Services	<input type="checkbox"/> Client Drop-off
		<input type="checkbox"/> US Mail	<input type="checkbox"/> Spee-Dee
		<input type="checkbox"/> Other: _____	
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice	<input type="checkbox"/> Blue ice	<input type="checkbox"/> Dry ice
		<input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE
Thermometer ID:	N	Correction Factor (°C):	+0.0
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	2.4	Corrected Temp (°C):	2.4
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
a) If yes: Is there evidence that the chilling process began?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C



Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.6	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information		
Client: <u>SCS Eng.</u>		
City/State: <u>Madison</u> <small>CITY</small>	<u>WI</u> <small>STATE</small>	Project: <u>Ottumwa Generating Station</u>
Receipt Information		
Date/Time Received: <u>4-15-20</u> <small>DATE</small>	<u>1740</u> <small>TIME</small>	Received By: <u>LAB</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: <u>N</u>	Correction Factor (°C): <u>+0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): <u>4.5</u>	Corrected Temp (°C): <u>4.5</u>	
• Sample Container Temperature		
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		

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**Chain of Custody Record**

<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: [Redacted] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: [Redacted]		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Phone: 608-509-8245 Project #: 31011020 SSON#: [Redacted]		Carrier Tracking No(s): 310-48977-15135.1 Page: Page 1 of 2 Job #: [Redacted]				
<b>Due Date Requested:</b> TAT Requested (days): [Redacted] PO #: 25220072 WO #: [Redacted]		<b>Analysis Requested</b>						
Matrix: Standard		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: [Redacted]						
<b>Sample Identification</b>		Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers						
Sample ID MW-301 MW-302 MW-303 MW-304 MW-305 MW-305a MW-306 MW-307 MW-308 MW-309 MW-310	Sample Date 4/14/20 4/14/20 4/14/20 4/13/20 4/13/20 4/14/20 4/14/20 4/14/20 4/14/20 4/14/20 4/13/20	Sample Time 1745 1700 1550 1705 1450 1015 1450 1140 1240 1350 1010	Sample Type (C=comp, G=grab) G G G G G G G G G G G	Matrix (W=water, S=solid, O=soil, T=tissue, A=air) Water Water Water Water Water Water Water Water Water Water Water	Field Filtered Sample (Yes or No) X X X X X X X X X X X	Perform MS/MSD (Yes or No) X X X X X X X X X X X	903.0, 904.0 5020A, 7470A 2540C_Calcd, 9056A_ORGM_2BD, SM4500_H+	Total Number of Containers X X X X X X X X X X X
<b>Possible Hazard Identification</b> <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b> <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months						
<b>Deliverable Requested:</b> I, II, III, IV, Other (specify)		<b>Special Instructions/QC Requirements:</b>						
<b>Empty Kit Relinquished by:</b> [Signature]		<b>Method of Shipment:</b>						
<b>Relinquished by:</b> [Signature]		<b>Date:</b> 4/15/2020 1400		<b>Company:</b> SCS				
<b>Relinquished by:</b> [Signature]		<b>Date/Time:</b> 4/15/2020 1740		<b>Company:</b>				
<b>Relinquished by:</b> [Signature]		<b>Date/Time:</b>		<b>Company:</b>				
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:						



<b>Client Information</b> Client Contact: Meghan Blodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: 25220072 Email: mblodgett@scsengineers.com Project Name: Orlumwa Generating Station 25220072 Site:		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carrier Tracking No(s): COC No: 310-48977-15135.2 Page: Page 2 of 2 Job #:	
Due Date Requested: TAT Requested (days): PO #: 25220072 WO #: <i>Standard</i> Project #: 31011020 SSOW#:		Analysis Requested Perform MS/MSD (Yes or No) 903.0, 904.0 6020A, 7470A 2540C_Calcd, 9056A_ORGM_28D, SM4500_H+	
Sample Identification MW-310A MW-311 MW-311A FIELD BLANK		Total Number of Containers Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers	
Sample Date 4/14/20 4/13/20 4/13/20 4/14/20		Sample Time 0940 1240 0835 2359	
Sample Type (C=Comp, G=grab) G G G G		Matrix (Water, Sewage, Urine, Blood, Urine, Tissue, Air) Water Water Water Water Water	
Preservation Code: G G G G		Field Filtered Sample (Yes or No) X X X X	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>Meghan Blodgett</i> Date/Time: 4/15/20 1400 Company: SCS		Relinquished by: <i>Monday Burdett</i> Date/Time: 4-15-20 1740 Company:	
Relinquished by:		Relinquished by:	
Relinquished by:		Relinquished by:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	



Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072.00\Data and Calculations\Field Work Requests\OGS\_CCR\_Rule\_Sampling\_2004.xls\$Sheet1

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____



Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-6

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-6

**Login Number: 179710**

**List Number: 2**

**Creator: Korrinhizer, Micha L**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 04/17/20 08:53 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-6

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Ba Carrier (40-110)	
310-179710-2	MW-302	81.4	
310-179710-3	MW-303	77.7	
310-179710-4	MW-304	80.2	
310-179710-5	MW-305	80.2	
310-179710-6	MW-305A	98.5	
310-179710-7	MW-306	61.9	
310-179710-11	MW-310	84.8	
310-179710-12	MW-310A	87.8	
310-179710-13	MW-311	88.4	
310-179710-14	MW-311A	95.7	
LCS 160-468451/1-A	Lab Control Sample	96.6	
LCS 160-468932/1-A	Lab Control Sample	73.8	
LCSD 160-468451/2-A	Lab Control Sample Dup	96.0	
LCSD 160-468932/2-A	Lab Control Sample Dup	79.3	
MB 160-468451/23-A	Method Blank	97.0	
MB 160-468932/21-A	Method Blank	83.5	

**Tracer/Carrier Legend**  
 Ba Carrier = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits)	
		Ba Carrier (40-110)	Y Carrier (40-110)
310-179710-2	MW-302	81.4	84.5
310-179710-3	MW-303	77.7	87.5
310-179710-4	MW-304	80.2	87.1
310-179710-5	MW-305	80.2	84.1
310-179710-6	MW-305A	98.5	84.5
310-179710-7	MW-306	61.9	86.0
310-179710-11	MW-310	84.8	84.1
310-179710-12	MW-310A	87.8	90.5
310-179710-13	MW-311	88.4	90.8
310-179710-14	MW-311A	95.7	82.6
LCS 160-468454/1-A	Lab Control Sample	96.6	75.5
LCS 160-468933/1-A	Lab Control Sample	73.8	89.7
LCSD 160-468454/2-A	Lab Control Sample Dup	96.0	80.0
LCSD 160-468933/2-A	Lab Control Sample Dup	79.3	88.2
MB 160-468454/23-A	Method Blank	97.0	85.2
MB 160-468933/21-A	Method Blank	83.5	83.4

**Tracer/Carrier Legend**  
 Ba Carrier = Ba Carrier  
 Y Carrier = Y Carrier

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-3

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
5/18/2020 10:50:50 AM*

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### LINKS

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Job ID: 310-179710-3

### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

#### Job Narrative 310-179710-3

#### Receipt

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved, and where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3°C, 2.6°C and 4.5°C

#### Department Gas Flow Proportional Counter

Method 903.0: Radium-226 Prep Batch 160-468451: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with preparation batch 160-468451. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were created to demonstrate batch precision

Method 903.0: Radium-226 Prep Batch 160-468451 / 160-468932

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-179710-1), (LCS 160-468451/1-A), (LCSD 160-468451/2-A) and (MB 160-468451/23-A, Field Blank (310-179710-15), (LCS 160-468932/1-A), (LCSD 160-468932/2-A) and (MB 160-468932/21-A

Method 904.0: Radium-228 Prep Batch 160-468454: Insufficient sample volume was available to perform a sample duplicate (DUP) associated with preparation batch 160-468454. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were created to demonstrate batch precision

Method 904.0: Ra-228 Prep Batch 160-468454 / 160-468933

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-179710-1), (LCS 160-468454/1-A), (LCSD 160-468454/2-A) and (MB 160-468454/23, Field Blank (310-179710-15), (LCS 160-468933/1-A), (LCSD 160-468933/2-A) and (MB 160-468933/21-A

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Department Rad

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-1	MW-301	Water	04/14/20 17:45	04/16/20 08:15	
310-179710-15	Field Blank	Water	04/14/20 23:59	04/16/20 08:15	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

**Client Sample ID: MW-301**

**Lab Sample ID: 310-179710-1**

No Detections.

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-179710-15**

No Detections.

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This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

**Client Sample ID: MW-301**

**Lab Sample ID: 310-179710-1**

Date Collected: 04/14/20 17:45

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0921	U	0.0818	0.0822	1.00	0.120	pCi/L	04/21/20 13:39	05/14/20 11:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					04/21/20 13:39	05/14/20 11:19	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.223	U	0.215	0.216	1.00	0.346	pCi/L	04/21/20 13:39	05/11/20 16:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	102		40 - 110					04/21/20 13:39	05/11/20 16:05	1
Y Carrier	83.4		40 - 110					04/21/20 13:39	05/11/20 16:05	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.315	U	0.230	0.231	5.00	0.346	pCi/L		05/15/20 07:55	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-179710-15**

Date Collected: 04/14/20 23:59

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00550	U	0.0636	0.0636	1.00	0.130	pCi/L	04/26/20 17:31	05/18/20 04:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					04/26/20 17:31	05/18/20 04:30	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.00439	U	0.217	0.217	1.00	0.390	pCi/L	04/26/20 17:49	05/13/20 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.1		40 - 110					04/26/20 17:49	05/13/20 07:53	1
Y Carrier	87.5		40 - 110					04/26/20 17:49	05/13/20 07:53	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.00989	U	0.226	0.226	5.00	0.390	pCi/L		05/18/20 10:15	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-468451/23-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared		Analyzed		Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)				04/21/20 13:39	05/14/20 11:19			
Radium-226	0.04590	U	0.0985	0.0985	1.00	0.181	pCi/L	04/21/20 13:39	05/14/20 11:19		1	
Carrier	MB		Limits			Prepared		Analyzed		Dil Fac		
Ba Carrier	%Yield	MB Qualifier	40 - 110			04/21/20 13:39		05/14/20 11:19		1		
	97.0											

**Lab Sample ID: LCS 160-468451/1-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	LCS		Spike	LCS	Total	RL	MDC	Unit	%Rec	%Rec. Limits	
	Result	LCS Qual	Added	Result	Uncert. (2σ+/-)					75 - 125	
Radium-226	13.34		15.1	13.34	1.48	1.00	0.146	pCi/L	88	75 - 125	
Carrier	LCS		Limits			Prepared		Analyzed		Dil Fac	
Ba Carrier	%Yield	LCS Qualifier	40 - 110			04/21/20 13:39		05/14/20 11:19		1	
	96.6										

**Lab Sample ID: LCSD 160-468451/2-A**  
**Matrix: Water**  
**Analysis Batch: 470398**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468451**

Analyte	LCSD		Spike	LCSD	Total	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit
	Result	LCSD Qual	Added	Result	Uncert. (2σ+/-)					75 - 125	0.50	1	
Radium-226	11.93		15.1	11.93	1.35	1.00	0.163	pCi/L	79	75 - 125	0.50	1	
Carrier	LCSD		Limits			Prepared		Analyzed		Dil Fac			
Ba Carrier	%Yield	LCSD Qualifier	40 - 110			04/21/20 13:39		05/14/20 11:19		1			
	96.0												

**Lab Sample ID: MB 160-468932/21-A**  
**Matrix: Water**  
**Analysis Batch: 470653**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468932**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared		Analyzed		Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)				04/26/20 17:31	05/18/20 06:37			
Radium-226	-0.0009617	U	0.0638	0.0638	1.00	0.134	pCi/L	04/26/20 17:31	05/18/20 06:37		1	
Carrier	MB		Limits			Prepared		Analyzed		Dil Fac		
Ba Carrier	%Yield	MB Qualifier	40 - 110			04/26/20 17:31		05/18/20 06:37		1		
	83.5											

**Lab Sample ID: LCS 160-468932/1-A**  
**Matrix: Water**  
**Analysis Batch: 470653**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468932**

Analyte	LCS		Spike	LCS	Total	RL	MDC	Unit	%Rec	%Rec. Limits	
	Result	LCS Qual	Added	Result	Uncert. (2σ+/-)					75 - 125	
Radium-226	10.45		11.3	10.45	1.16	1.00	0.168	pCi/L	92	75 - 125	

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Method: 903.0 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-468932/1-A  
Matrix: Water  
Analysis Batch: 470653

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 468932

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	73.8		40 - 110

Lab Sample ID: LCSD 160-468932/2-A  
Matrix: Water  
Analysis Batch: 470653

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 468932

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec.		RER
									Limits	RER	Limit
Radium-226	11.3	10.46		1.15	1.00	0.150	pCi/L	92	75 - 125	0.01	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	79.3		40 - 110

## Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-468454/23-A  
Matrix: Water  
Analysis Batch: 469973

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 468454

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared		Analyzed		Dil Fac
								04/21/20 13:39	05/11/20 16:05	05/11/20 16:05	16:05	1
Radium-228	-0.1479	U	0.287	0.287	1.00	0.548	pCi/L	04/21/20 13:39	05/11/20 16:05	05/11/20 16:05	16:05	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.0		40 - 110	04/21/20 13:39	05/11/20 16:05	1
Y Carrier	85.2		40 - 110	04/21/20 13:39	05/11/20 16:05	1

Lab Sample ID: LCS 160-468454/1-A  
Matrix: Water  
Analysis Batch: 469997

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 468454

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec.	
									Limits	RER
Radium-228	11.8	11.66		1.45	1.00	0.624	pCi/L	99	75 - 125	

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	96.6		40 - 110
Y Carrier	75.5		40 - 110

Lab Sample ID: LCSD 160-468454/2-A  
Matrix: Water  
Analysis Batch: 469997

Client Sample ID: Lab Control Sample Dup  
Prep Type: Total/NA  
Prep Batch: 468454

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec.		RER
									Limits	RER	Limit
Radium-228	11.8	10.53		1.33	1.00	0.594	pCi/L	89	75 - 125	0.41	1

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCSD 160-468454/2-A**  
**Matrix: Water**  
**Analysis Batch: 469997**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468454**

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	96.0		40 - 110
Y Carrier	80.0		40 - 110

**Lab Sample ID: MB 160-468933/21-A**  
**Matrix: Water**  
**Analysis Batch: 470297**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	MB		Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Radium-228	0.2426	U	0.273	0.274	1.00	0.449	pCi/L	04/26/20 17:49	05/13/20 07:56	1

Carrier	MB		Limits	Prepared	Analyzed	Dil Fac
	%Yield	Qualifier				
Ba Carrier	83.5		40 - 110	04/26/20 17:49	05/13/20 07:56	1
Y Carrier	83.4		40 - 110	04/26/20 17:49	05/13/20 07:56	1

**Lab Sample ID: LCS 160-468933/1-A**  
**Matrix: Water**  
**Analysis Batch: 470272**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits

Carrier	LCS		Limits
	%Yield	Qualifier	
Ba Carrier	73.8		40 - 110
Y Carrier	89.7		40 - 110

**Lab Sample ID: LCSD 160-468933/2-A**  
**Matrix: Water**  
**Analysis Batch: 470272**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 468933**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit

Carrier	LCSD		Limits
	%Yield	Qualifier	
Ba Carrier	79.3		40 - 110
Y Carrier	88.2		40 - 110

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Rad

### Prep Batch: 468451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	PrecSep-21	
MB 160-468451/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-468451/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-468451/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 468454

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-1	MW-301	Total/NA	Water	PrecSep_0	
MB 160-468454/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-468454/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-468454/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

### Prep Batch: 468932

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-15	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-468932/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-468932/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-468932/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 468933

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-15	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-468933/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-468933/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-468933/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	





# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Client Sample ID: MW-301

Date Collected: 04/14/20 17:45

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468451	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	903.0		1	470398	05/14/20 11:19	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468454	04/21/20 13:39	MMO	TAL SL
Total/NA	Analysis	904.0		1	469973	05/11/20 16:05	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470557	05/15/20 07:55	SMP	TAL SL

## Client Sample ID: Field Blank

Date Collected: 04/14/20 23:59

Date Received: 04/16/20 08:15

## Lab Sample ID: 310-179710-15

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			468932	04/26/20 17:31	MNH	TAL SL
Total/NA	Analysis	903.0		1	470653	05/18/20 04:30	KLS	TAL SL
Total/NA	Prep	PrecSep_0			468933	04/26/20 17:49	MNH	TAL SL
Total/NA	Analysis	904.0		1	470272	05/13/20 07:53	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	470663	05/18/20 10:15	SMP	TAL SL

### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Illinois	NELAP	004553	11-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

- EPA = US Environmental Protection Agency
- None = None
- TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

- TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566





Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

Client Information			
Client: SCS Eng.			
City/State: <small>CITY</small> Madison	<small>STATE</small> WI	Project: Ottumura Generating Station	
Receipt Information			
Date/Time Received: <small>DATE</small> 4-15-20	<small>TIME</small> 1740	Received By: LAB	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N	Correction Factor (°C): 10.0		
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 2.4	Corrected Temp (°C): 2.4		
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C

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Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



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**Cooler/Sample Receipt and Temperature Log Form**

Client Information		
Client: SCS Eng.		
City/State: <small>CITY</small> Madison	<small>STATE</small> WI	Project: Ottumwa Generating Station
Receipt Information		
Date/Time Received: <small>DATE</small> 4-15-20	<small>TIME</small> 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: N	Correction Factor (°C): 10.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): 4.5	Corrected Temp (°C): 4.5	
• Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		

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**Chain of Custody Record**

<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: [Redacted] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: [Redacted]		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carmer Tracking No(s): 310-48977-15135.1 Page: Page 1 of 2 Job #:	
Due Date Requested: TAT Requested (days): PO #: 25220072 WO #: Project #: 31011020 SSONW#:		<b>Analysis Requested</b> Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No) 903.0, 904.0 5020A, 7470A 2540C_Calcd, 9056A_ORGM_2BD, SM4500_H+	
Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecalhydrate U - Acetone V - MCAA W - pH 4-5 L - EDA Z - other (specify)	
Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers		Total Number of containers:	
<b>Sample Identification</b> MW-301 MW-302 MW-303 MW-304 MW-305 MW-305a MW-306 MW-307 MW-308 MW-309 MW-310		Sample Date 4/14/20 4/14/20 4/14/20 4/13/20 4/13/20 4/14/20 4/14/20 4/14/20 4/14/20 4/13/20	
Sample Time 1745 1700 1550 1705 1450 1015 1450 1140 1240 1350 1010		Matrix (W=water, S=solid, O=soil, A=air) Water Water Water Water Water Water Water Water Water Water Water	
Sample Type (C=comp, G=grab) G G G G G G G G G G G		Preservation Code: G G G G G G G G G G G	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological			
Deliverable Requested: I, II, III, IV, Other (specify)			
Empty Kit Relinquished by:			
Relinquished by: [Signature] Date: 4/15/2020 1400 Company: SCS		Received by: [Signature] Date: 4-15-20 1740 Company:	
Relinquished by: [Signature] Date:		Received by: [Signature] Date:	
Relinquished by:		Received by:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	





Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072.00\Data and Calculations\Field Work Requests\OGS\_CCR\_Rule\_Sampling\_2004.xls\$Sheet1

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-3

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-3

**Login Number: 179710**

**List Number: 2**

**Creator: Korrinhizer, Micha L**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 04/17/20 08:53 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Tracer/Carrier Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-3

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)		
310-179710-1	MW-301	102		
310-179710-15	Field Blank	88.1		
LCS 160-468451/1-A	Lab Control Sample	96.6		
LCS 160-468932/1-A	Lab Control Sample	73.8		
LCSD 160-468451/2-A	Lab Control Sample Dup	96.0		
LCSD 160-468932/2-A	Lab Control Sample Dup	79.3		
MB 160-468451/23-A	Method Blank	97.0		
MB 160-468932/21-A	Method Blank	83.5		
<b>Tracer/Carrier Legend</b>				
Ba Carrier = Ba Carrier				

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

			Percent Yield (Acceptance Limits)		
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)		
310-179710-1	MW-301	102	83.4		
310-179710-15	Field Blank	88.1	87.5		
LCS 160-468454/1-A	Lab Control Sample	96.6	75.5		
LCS 160-468933/1-A	Lab Control Sample	73.8	89.7		
LCSD 160-468454/2-A	Lab Control Sample Dup	96.0	80.0		
LCSD 160-468933/2-A	Lab Control Sample Dup	79.3	88.2		
MB 160-468454/23-A	Method Blank	97.0	85.2		
MB 160-468933/21-A	Method Blank	83.5	83.4		
<b>Tracer/Carrier Legend</b>					
Ba Carrier = Ba Carrier					
Y Carrier = Y Carrier					

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-4

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
4/22/2020 10:52:45 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

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## Job ID: 310-179710-4

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### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-179710-4

#### Comments

No additional comments.

#### Receipt

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3° C, 2.6° C and 4.5° C.

#### HPLC/IC

Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-302 (310-179710-2), MW-303 (310-179710-3), MW-306 (310-179710-7) and MW-311 (310-179710-13). Elevated reporting limits (RLs) are provided.

Methods 300.0, 9056A: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 310-276088 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-2	MW-302	Water	04/14/20 17:00	04/16/20 08:15	
310-179710-3	MW-303	Water	04/14/20 15:50	04/16/20 08:15	
310-179710-4	MW-304	Water	04/13/20 17:05	04/16/20 08:15	
310-179710-5	MW-305	Water	04/13/20 14:50	04/16/20 08:15	
310-179710-6	MW-305A	Water	04/14/20 10:15	04/16/20 08:15	
310-179710-7	MW-306	Water	04/14/20 14:50	04/16/20 08:15	
310-179710-11	MW-310	Water	04/13/20 10:10	04/16/20 08:15	
310-179710-12	MW-310A	Water	04/14/20 09:40	04/16/20 08:15	
310-179710-13	MW-311	Water	04/13/20 12:40	04/16/20 08:15	
310-179710-14	MW-311A	Water	04/13/20 08:35	04/16/20 08:15	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-302

## Lab Sample ID: 310-179710-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	220		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	790		20	14	mg/L	20		9056A	Total/NA
Barium	23		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1200		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.23		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Chromium	1.4	J	5.0	1.1	ug/L	1		6020A	Total/NA
Cobalt	5.3		0.50	0.091	ug/L	1		6020A	Total/NA
Lead	1.0		0.50	0.27	ug/L	1		6020A	Total/NA
Lithium	11		10	2.3	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1500		60	52	mg/L	1		SM 2540C	Total/NA
pH	6.7		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	656.45				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	135.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.22				mg/L	1		Field Sampling	Total/NA
pH, Field	6.70				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1971				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	10.5				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	31.1				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-303

## Lab Sample ID: 310-179710-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	47		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	180		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	64		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	420		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.18		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	170		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.87		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	4.7	J	10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	3.6		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	5.0		5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	810		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.9		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	654.08				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	104.3				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.94				mg/L	1		Field Sampling	Total/NA
pH, Field	6.98				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1097				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	8.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	12.1				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-304

## Lab Sample ID: 310-179710-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	250		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.1		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	220		5.0	3.6	mg/L	5		9056A	Total/NA
Arsenic	0.96	J	2.0	0.88	ug/L	1		6020A	Total/NA
Barium	80		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1000		200	100	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-304 (Continued)

## Lab Sample ID: 310-179710-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	130		0.50	0.19	mg/L	1		6020A	Total/NA
Chromium	3.5	J	5.0	1.1	ug/L	1		6020A	Total/NA
Cobalt	0.57		0.50	0.091	ug/L	1		6020A	Total/NA
Lead	0.50		0.50	0.27	ug/L	1		6020A	Total/NA
Lithium	4.8	J	10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	2.0		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1000		60	52	mg/L	1		SM 2540C	Total/NA
pH	7.1		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	656.42				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-119.8				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.24				mg/L	1		Field Sampling	Total/NA
pH, Field	7.12				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1764				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	54.1				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305

## Lab Sample ID: 310-179710-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	270		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.35	J	0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	63		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	110		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	920		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.14		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	100		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	16		0.50	0.091	ug/L	1		6020A	Total/NA
Lead	0.27	J	0.50	0.27	ug/L	1		6020A	Total/NA
Lithium	3.2	J	10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	6.9		2.0	1.1	ug/L	1		6020A	Total/NA
Thallium	0.35	J	1.0	0.26	ug/L	1		6020A	Total/NA
Total Dissolved Solids	960		60	52	mg/L	1		SM 2540C	Total/NA
pH	7.2		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	662.44				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	6.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.28				mg/L	1		Field Sampling	Total/NA
pH, Field	7.00				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1772				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	9.1				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	21.7				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305A

## Lab Sample ID: 310-179710-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	89		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.73		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	93		5.0	3.6	mg/L	5		9056A	Total/NA
Antimony	0.88	J	1.0	0.58	ug/L	1		6020A	Total/NA
Barium	80		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	280		200	100	ug/L	1		6020A	Total/NA
Calcium	130		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	2.7		0.50	0.091	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-305A (Continued)

## Lab Sample ID: 310-179710-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	16		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	17		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	1.7	J	5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	570		30	26	mg/L	1		SM 2540C	Total/NA
pH	7.3		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Oxidation Reduction Potential	106.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	2.26				mg/L	1		Field Sampling	Total/NA
pH, Field	7.63				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	807				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	4.91				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-306

## Lab Sample ID: 310-179710-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	41		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	310		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	48		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1000		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.83		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	73		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	5.5		0.50	0.091	ug/L	1		6020A	Total/NA
Lead	0.37	J	0.50	0.27	ug/L	1		6020A	Total/NA
Molybdenum	4.4		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	820		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.8		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	670.71				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	49.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.21				mg/L	1		Field Sampling	Total/NA
pH, Field	6.68				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1158				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	11.7				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	15.7				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-179710-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	130		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.1		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	590		20	14	mg/L	20		9056A	Total/NA
Barium	62		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	550		200	100	ug/L	1		6020A	Total/NA
Cadmium	0.16		0.10	0.039	ug/L	1		6020A	Total/NA
Calcium	200		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.24	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	48		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	31		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	4.5	J	5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1300		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.0		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	645.91				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	179.4				millivolts	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-310 (Continued)

## Lab Sample ID: 310-179710-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Oxygen, Dissolved, Client Supplied	0.22				mg/L	1		Field Sampling	Total/NA
pH, Field	7.00				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1823				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	10.3				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.87				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-179710-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	130		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.8		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1100		20	14	mg/L	20		9056A	Total/NA
Barium	16		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1600		200	100	ug/L	1		6020A	Total/NA
Calcium	87		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.39	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	290		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	2.7		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2300		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.5		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Oxidation Reduction Potential	146.1				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	6.39				mg/L	1		Field Sampling	Total/NA
pH, Field	7.85				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	2915				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	8.8				Degrees C	1		Field Sampling	Total/NA

## Client Sample ID: MW-311

## Lab Sample ID: 310-179710-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	54		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	180		2.0	0.90	ug/L	1		6020A	Total/NA
Calcium	170		0.50	0.19	mg/L	1		6020A	Total/NA
Lithium	6.2	J	10	2.3	ug/L	1		6020A	Total/NA
Total Dissolved Solids	570		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.9		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	646.79				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	103.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.29				mg/L	1		Field Sampling	Total/NA
pH, Field	6.86				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	912				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	8.8				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.44				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-179710-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	140		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	4.1		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1200		20	14	mg/L	20		9056A	Total/NA
Barium	20		2.0	0.90	ug/L	1		6020A	Total/NA
Boron	1500		200	100	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-311A (Continued)**

**Lab Sample ID: 310-179710-14**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	48		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.13	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	310		10	2.3	ug/L	1		6020A	Total/NA
Molybdenum	2.8		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2400		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.9		0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Oxidation Reduction Potential	115.8				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	3.87				mg/L	1		Field Sampling	Total/NA
pH, Field	8.40				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3027				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	7.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	3.19				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

Date Collected: 04/14/20 17:00

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	220		5.0	2.0	mg/L			04/16/20 23:58	5
Fluoride	<0.23		0.50	0.23	mg/L			04/16/20 23:58	5
Sulfate	790		20	14	mg/L			04/17/20 08:30	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:12	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:12	1
Barium	23		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:12	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:12	1
Boron	1200		200	100	ug/L		04/17/20 08:00	04/21/20 12:12	1
Cadmium	0.23		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:12	1
Calcium	180		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:12	1
Chromium	1.4	J	5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:12	1
Cobalt	5.3		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:12	1
Lead	1.0		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:12	1
Lithium	11		10	2.3	ug/L		04/17/20 08:00	04/21/20 12:12	1
Molybdenum	<1.1		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:12	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:12	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:12	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:06	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1500		60	52	mg/L			04/16/20 12:43	1
pH	6.7		0.1	0.1	SU			04/15/20 22:08	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	656.45				ft			04/14/20 17:00	1
Oxidation Reduction Potential	135.6				millivolts			04/14/20 17:00	1
Oxygen, Dissolved, Client Supplied	0.22				mg/L			04/14/20 17:00	1
pH, Field	6.70				SU			04/14/20 17:00	1
Specific Conductance, Field	1971				umhos/cm			04/14/20 17:00	1
Temperature, Field	10.5				Degrees C			04/14/20 17:00	1
Turbidity, Field	31.1				NTU			04/14/20 17:00	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

Date Collected: 04/14/20 15:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	47		5.0	2.0	mg/L			04/17/20 00:13	5
Fluoride	<0.23		0.50	0.23	mg/L			04/17/20 00:13	5
Sulfate	180		5.0	3.6	mg/L			04/17/20 00:13	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:15	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:15	1
Barium	64		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:15	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:15	1
Boron	420		200	100	ug/L		04/17/20 08:00	04/21/20 12:15	1
Cadmium	0.18		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:15	1
Calcium	170		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:15	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:15	1
Cobalt	0.87		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:15	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:15	1
Lithium	4.7	J	10	2.3	ug/L		04/17/20 08:00	04/21/20 12:15	1
Molybdenum	3.6		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:15	1
Selenium	5.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:15	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:15	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:08	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	810		30	26	mg/L			04/16/20 12:43	1
pH	6.9		0.1	0.1	SU			04/15/20 22:09	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	654.08				ft			04/14/20 15:50	1
Oxidation Reduction Potential	104.3				millivolts			04/14/20 15:50	1
Oxygen, Dissolved, Client Supplied	1.94				mg/L			04/14/20 15:50	1
pH, Field	6.98				SU			04/14/20 15:50	1
Specific Conductance, Field	1097				umhos/cm			04/14/20 15:50	1
Temperature, Field	8.9				Degrees C			04/14/20 15:50	1
Turbidity, Field	12.1				NTU			04/14/20 15:50	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

Date Collected: 04/13/20 17:05

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		5.0	2.0	mg/L			04/17/20 00:29	5
Fluoride	1.1		0.50	0.23	mg/L			04/17/20 00:29	5
Sulfate	220		5.0	3.6	mg/L			04/17/20 00:29	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:19	1
Arsenic	0.96	J	2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:19	1
Barium	80		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:19	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:19	1
Boron	1000		200	100	ug/L		04/17/20 08:00	04/21/20 12:19	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:19	1
Calcium	130		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:19	1
Chromium	3.5	J	5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:19	1
Cobalt	0.57		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:19	1
Lead	0.50		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:19	1
Lithium	4.8	J	10	2.3	ug/L		04/17/20 08:00	04/21/20 12:19	1
Molybdenum	2.0		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:19	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:19	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:19	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:11	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1000		60	52	mg/L			04/16/20 12:43	1
pH	7.1		0.1	0.1	SU			04/15/20 22:10	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	656.42				ft			04/13/20 17:05	1
Oxidation Reduction Potential	-119.8				millivolts			04/13/20 17:05	1
Oxygen, Dissolved, Client Supplied	0.24				mg/L			04/13/20 17:05	1
pH, Field	7.12				SU			04/13/20 17:05	1
Specific Conductance, Field	1764				umhos/cm			04/13/20 17:05	1
Temperature, Field	11.9				Degrees C			04/13/20 17:05	1
Turbidity, Field	54.1				NTU			04/13/20 17:05	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

Date Collected: 04/13/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	270		5.0	2.0	mg/L			04/17/20 00:45	5
Fluoride	0.35	J	0.50	0.23	mg/L			04/17/20 00:45	5
Sulfate	63		5.0	3.6	mg/L			04/17/20 00:45	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:22	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:22	1
Barium	110		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:22	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:22	1
Boron	920		200	100	ug/L		04/17/20 08:00	04/21/20 12:22	1
Cadmium	0.14		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:22	1
Calcium	100		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:22	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:22	1
Cobalt	16		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:22	1
Lead	0.27	J	0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:22	1
Lithium	3.2	J	10	2.3	ug/L		04/17/20 08:00	04/21/20 12:22	1
Molybdenum	6.9		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:22	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:22	1
Thallium	0.35	J	1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:22	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:13	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	960		60	52	mg/L			04/16/20 12:43	1
pH	7.2		0.1	0.1	SU			04/15/20 22:11	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	662.44				ft			04/13/20 14:50	1
Oxidation Reduction Potential	6.6				millivolts			04/13/20 14:50	1
Oxygen, Dissolved, Client Supplied	0.28				mg/L			04/13/20 14:50	1
pH, Field	7.00				SU			04/13/20 14:50	1
Specific Conductance, Field	1772				umhos/cm			04/13/20 14:50	1
Temperature, Field	9.1				Degrees C			04/13/20 14:50	1
Turbidity, Field	21.7				NTU			04/13/20 14:50	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-179710-6**

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	89		5.0	2.0	mg/L			04/17/20 01:00	5
Fluoride	0.73		0.50	0.23	mg/L			04/17/20 01:00	5
Sulfate	93		5.0	3.6	mg/L			04/17/20 01:00	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.88	J	1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:25	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:25	1
Barium	80		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:25	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:25	1
Boron	280		200	100	ug/L		04/17/20 08:00	04/21/20 12:25	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:25	1
Calcium	130		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:25	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:25	1
Cobalt	2.7		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:25	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:25	1
Lithium	16		10	2.3	ug/L		04/17/20 08:00	04/21/20 12:25	1
Molybdenum	17		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:25	1
Selenium	1.7	J	5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:25	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:25	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:15	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	570		30	26	mg/L			04/16/20 12:43	1
pH	7.3		0.1	0.1	SU			04/15/20 22:12	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	106.7				millivolts			04/14/20 10:15	1
Oxygen, Dissolved, Client Supplied	2.26				mg/L			04/14/20 10:15	1
pH, Field	7.63				SU			04/14/20 10:15	1
Specific Conductance, Field	807				umhos/cm			04/14/20 10:15	1
Temperature, Field	11.2				Degrees C			04/14/20 10:15	1
Turbidity, Field	4.91				NTU			04/14/20 10:15	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-306**

**Lab Sample ID: 310-179710-7**

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>41</b>		5.0	2.0	mg/L			04/17/20 01:16	5
Fluoride	<0.23		0.50	0.23	mg/L			04/17/20 01:16	5
<b>Sulfate</b>	<b>310</b>		5.0	3.6	mg/L			04/17/20 01:16	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:31	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Barium</b>	<b>48</b>		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:31	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Boron</b>	<b>1000</b>		200	100	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Cadmium</b>	<b>0.83</b>		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Calcium</b>	<b>73</b>		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:31	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Cobalt</b>	<b>5.5</b>		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Lead</b>	<b>0.37 J</b>		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:31	1
Lithium	<2.3		10	2.3	ug/L		04/17/20 08:00	04/21/20 12:31	1
<b>Molybdenum</b>	<b>4.4</b>		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:31	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:31	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:31	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:17	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>820</b>		30	26	mg/L			04/16/20 12:43	1
<b>pH</b>	<b>6.8</b>		0.1	0.1	SU			04/15/20 22:13	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>670.71</b>				ft			04/14/20 14:50	1
<b>Oxidation Reduction Potential</b>	<b>49.7</b>				millivolts			04/14/20 14:50	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>0.21</b>				mg/L			04/14/20 14:50	1
<b>pH, Field</b>	<b>6.68</b>				SU			04/14/20 14:50	1
<b>Specific Conductance, Field</b>	<b>1158</b>				umhos/cm			04/14/20 14:50	1
<b>Temperature, Field</b>	<b>11.7</b>				Degrees C			04/14/20 14:50	1
<b>Turbidity, Field</b>	<b>15.7</b>				NTU			04/14/20 14:50	1

# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-310**

**Lab Sample ID: 310-179710-11**

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		5.0	2.0	mg/L			04/17/20 02:18	5
Fluoride	1.1		0.50	0.23	mg/L			04/17/20 02:18	5
Sulfate	590		20	14	mg/L			04/17/20 02:34	20

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 12:58	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 12:58	1
Barium	62		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 12:58	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 12:58	1
Boron	550		200	100	ug/L		04/17/20 08:00	04/21/20 12:58	1
Cadmium	0.16		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 12:58	1
Calcium	200		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 12:58	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:58	1
Cobalt	0.24	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 12:58	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 12:58	1
Lithium	48		10	2.3	ug/L		04/17/20 08:00	04/21/20 12:58	1
Molybdenum	31		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 12:58	1
Selenium	4.5	J	5.0	1.0	ug/L		04/17/20 08:00	04/21/20 12:58	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 12:58	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:38	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1300		150	130	mg/L			04/16/20 12:43	1
pH	7.0		0.1	0.1	SU			04/15/20 22:23	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	645.91				ft			04/13/20 10:10	1
Oxidation Reduction Potential	179.4				millivolts			04/13/20 10:10	1
Oxygen, Dissolved, Client Supplied	0.22				mg/L			04/13/20 10:10	1
pH, Field	7.00				SU			04/13/20 10:10	1
Specific Conductance, Field	1823				umhos/cm			04/13/20 10:10	1
Temperature, Field	10.3				Degrees C			04/13/20 10:10	1
Turbidity, Field	0.87				NTU			04/13/20 10:10	1

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-179710-12**

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		5.0	2.0	mg/L			04/17/20 02:49	5
Fluoride	1.8		0.50	0.23	mg/L			04/17/20 02:49	5
Sulfate	1100		20	14	mg/L			04/17/20 03:05	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 13:01	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 13:01	1
Barium	16		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 13:01	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 13:01	1
Boron	1600		200	100	ug/L		04/17/20 08:00	04/21/20 13:01	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 13:01	1
Calcium	87		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 13:01	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:01	1
Cobalt	0.39	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:01	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 13:01	1
Lithium	290		10	2.3	ug/L		04/17/20 08:00	04/21/20 13:01	1
Molybdenum	2.7		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:01	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 13:01	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 13:01	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:40	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2300		150	130	mg/L			04/16/20 12:43	1
pH	7.5		0.1	0.1	SU			04/15/20 22:24	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	146.1				millivolts			04/14/20 09:40	1
Oxygen, Dissolved, Client Supplied	6.39				mg/L			04/14/20 09:40	1
pH, Field	7.85				SU			04/14/20 09:40	1
Specific Conductance, Field	2915				umhos/cm			04/14/20 09:40	1
Temperature, Field	8.8				Degrees C			04/14/20 09:40	1

# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-311**

**Lab Sample ID: 310-179710-13**

Date Collected: 04/13/20 12:40

Matrix: Water

Date Received: 04/16/20 08:15

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>13</b>		5.0	2.0	mg/L			04/17/20 03:21	5
Fluoride	<0.23		0.50	0.23	mg/L			04/17/20 03:21	5
<b>Sulfate</b>	<b>54</b>		5.0	3.6	mg/L			04/17/20 03:21	5

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 13:05	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Barium</b>	<b>180</b>		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 13:05	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 13:05	1
Boron	<100		200	100	ug/L		04/17/20 08:00	04/21/20 13:05	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Calcium</b>	<b>170</b>		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 13:05	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:05	1
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:05	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Lithium</b>	<b>6.2 J</b>		10	2.3	ug/L		04/17/20 08:00	04/21/20 13:05	1
Molybdenum	<1.1		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:05	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 13:05	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 13:05	1

### Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 14:42	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>570</b>		30	26	mg/L			04/16/20 12:43	1
<b>pH</b>	<b>6.9</b>		0.1	0.1	SU			04/15/20 22:24	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>646.79</b>				ft			04/13/20 12:40	1
<b>Oxidation Reduction Potential</b>	<b>103.4</b>				millivolts			04/13/20 12:40	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>0.29</b>				mg/L			04/13/20 12:40	1
<b>pH, Field</b>	<b>6.86</b>				SU			04/13/20 12:40	1
<b>Specific Conductance, Field</b>	<b>912</b>				umhos/cm			04/13/20 12:40	1
<b>Temperature, Field</b>	<b>8.8</b>				Degrees C			04/13/20 12:40	1
<b>Turbidity, Field</b>	<b>0.44</b>				NTU			04/13/20 12:40	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

Date Collected: 04/13/20 08:35

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	140		5.0	2.0	mg/L			04/17/20 03:37	5
Fluoride	4.1		0.50	0.23	mg/L			04/17/20 03:37	5
Sulfate	1200		20	14	mg/L			04/17/20 03:53	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 13:08	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 13:08	1
Barium	20		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 13:08	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 13:08	1
Boron	1500		200	100	ug/L		04/17/20 08:00	04/21/20 13:08	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 13:08	1
Calcium	48		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 13:08	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:08	1
Cobalt	0.13	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:08	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 13:08	1
Lithium	310		10	2.3	ug/L		04/17/20 08:00	04/21/20 13:08	1
Molybdenum	2.8		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 13:08	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 13:08	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 13:08	1

**Method: 7470A - Mercury (CVAA)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:20	04/17/20 14:49	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2400		150	130	mg/L			04/16/20 12:43	1
pH	7.9		0.1	0.1	SU			04/15/20 22:27	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Oxidation Reduction Potential	115.8				millivolts			04/13/20 08:35	1
Oxygen, Dissolved, Client Supplied	3.87				mg/L			04/13/20 08:35	1
pH, Field	8.40				SU			04/13/20 08:35	1
Specific Conductance, Field	3027				umhos/cm			04/13/20 08:35	1
Temperature, Field	7.9				Degrees C			04/13/20 08:35	1
Turbidity, Field	3.19				NTU			04/13/20 08:35	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-276088/3**  
**Matrix: Water**  
**Analysis Batch: 276088**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			04/16/20 20:04	1
Fluoride	<0.046		0.10	0.046	mg/L			04/16/20 20:04	1
Sulfate	<0.71		1.0	0.71	mg/L			04/16/20 20:04	1

**Lab Sample ID: LCS 310-276088/4**  
**Matrix: Water**  
**Analysis Batch: 276088**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.68		mg/L		97	90 - 110
Fluoride	2.00	2.15		mg/L		107	90 - 110
Sulfate	10.0	10.2		mg/L		102	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-276012/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.58		1.0	0.58	ug/L		04/17/20 08:00	04/21/20 11:30	1
Arsenic	<0.88		2.0	0.88	ug/L		04/17/20 08:00	04/21/20 11:30	1
Barium	<0.90		2.0	0.90	ug/L		04/17/20 08:00	04/21/20 11:30	1
Beryllium	<0.27		1.0	0.27	ug/L		04/17/20 08:00	04/21/20 11:30	1
Boron	<100		200	100	ug/L		04/17/20 08:00	04/21/20 11:30	1
Cadmium	<0.039		0.10	0.039	ug/L		04/17/20 08:00	04/21/20 11:30	1
Calcium	<0.19		0.50	0.19	mg/L		04/17/20 08:00	04/21/20 11:30	1
Chromium	<1.1		5.0	1.1	ug/L		04/17/20 08:00	04/21/20 11:30	1
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 11:30	1
Lead	<0.27		0.50	0.27	ug/L		04/17/20 08:00	04/21/20 11:30	1
Lithium	<2.3		10	2.3	ug/L		04/17/20 08:00	04/21/20 11:30	1
Molybdenum	<1.1		2.0	1.1	ug/L		04/17/20 08:00	04/21/20 11:30	1
Selenium	<1.0		5.0	1.0	ug/L		04/17/20 08:00	04/21/20 11:30	1
Thallium	<0.26		1.0	0.26	ug/L		04/17/20 08:00	04/21/20 11:30	1

**Lab Sample ID: LCS 310-276012/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	40.0	38.0		ug/L		95	80 - 120
Arsenic	80.0	77.0		ug/L		96	80 - 120
Barium	80.0	80.8		ug/L		101	80 - 120
Beryllium	40.0	39.7		ug/L		99	80 - 120
Boron	1760	1750		ug/L		99	80 - 120
Cadmium	40.0	41.1		ug/L		103	80 - 120
Calcium	4.00	3.99		mg/L		100	80 - 120
Chromium	80.0	80.2		ug/L		100	80 - 120
Cobalt	40.0	40.0		ug/L		100	80 - 120

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# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Method: 6020A - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-276012/2-A  
Matrix: Water  
Analysis Batch: 276475

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 276012

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	40.0	43.3		ug/L		108	80 - 120
Lithium	200	208		ug/L		104	80 - 120
Molybdenum	80.0	79.9		ug/L		100	80 - 120
Selenium	80.0	77.2		ug/L		97	80 - 120
Thallium	32.0	31.4		ug/L		98	80 - 120

## Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-275975/1-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 275975

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:19	04/17/20 13:31	1

Lab Sample ID: LCS 310-275975/2-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 275975

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.88		ug/L		113	80 - 120

Lab Sample ID: MB 310-275976/1-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.10		0.20	0.10	ug/L		04/16/20 13:20	04/17/20 14:44	1

Lab Sample ID: LCS 310-275976/2-A  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	1.67	1.87		ug/L		112	80 - 120

Lab Sample ID: 310-179710-14 MS  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: MW-311A  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.10		1.67	1.90		ug/L		114	80 - 120

Lab Sample ID: 310-179710-14 MSD  
Matrix: Water  
Analysis Batch: 276156

Client Sample ID: MW-311A  
Prep Type: Total/NA  
Prep Batch: 275976

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	<0.10		1.67	1.85		ug/L		111	80 - 120	3	20

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-275971/1  
 Matrix: Water  
 Analysis Batch: 275971

Client Sample ID: Method Blank  
 Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			04/16/20 12:43	1

Lab Sample ID: LCS 310-275971/2  
 Matrix: Water  
 Analysis Batch: 275971

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	966		mg/L		97	90 - 110

Lab Sample ID: 310-179710-2 DU  
 Matrix: Water  
 Analysis Batch: 275971

Client Sample ID: MW-302  
 Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	1500		1520		mg/L		2	24

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-275892/24  
 Matrix: Water  
 Analysis Batch: 275892

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## HPLC/IC

### Analysis Batch: 276088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	9056A	
310-179710-2	MW-302	Total/NA	Water	9056A	
310-179710-3	MW-303	Total/NA	Water	9056A	
310-179710-4	MW-304	Total/NA	Water	9056A	
310-179710-5	MW-305	Total/NA	Water	9056A	
310-179710-6	MW-305A	Total/NA	Water	9056A	
310-179710-7	MW-306	Total/NA	Water	9056A	
310-179710-11	MW-310	Total/NA	Water	9056A	
310-179710-11	MW-310	Total/NA	Water	9056A	
310-179710-12	MW-310A	Total/NA	Water	9056A	
310-179710-12	MW-310A	Total/NA	Water	9056A	
310-179710-13	MW-311	Total/NA	Water	9056A	
310-179710-14	MW-311A	Total/NA	Water	9056A	
310-179710-14	MW-311A	Total/NA	Water	9056A	
MB 310-276088/3	Method Blank	Total/NA	Water	9056A	
LCS 310-276088/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 275975

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	7470A	
310-179710-3	MW-303	Total/NA	Water	7470A	
310-179710-4	MW-304	Total/NA	Water	7470A	
310-179710-5	MW-305	Total/NA	Water	7470A	
310-179710-6	MW-305A	Total/NA	Water	7470A	
310-179710-7	MW-306	Total/NA	Water	7470A	
310-179710-11	MW-310	Total/NA	Water	7470A	
310-179710-12	MW-310A	Total/NA	Water	7470A	
310-179710-13	MW-311	Total/NA	Water	7470A	
MB 310-275975/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-275975/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Prep Batch: 275976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-14	MW-311A	Total/NA	Water	7470A	
MB 310-275976/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-275976/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-179710-14 MS	MW-311A	Total/NA	Water	7470A	
310-179710-14 MSD	MW-311A	Total/NA	Water	7470A	

### Prep Batch: 276012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	3010A	
310-179710-3	MW-303	Total/NA	Water	3010A	
310-179710-4	MW-304	Total/NA	Water	3010A	
310-179710-5	MW-305	Total/NA	Water	3010A	
310-179710-6	MW-305A	Total/NA	Water	3010A	
310-179710-7	MW-306	Total/NA	Water	3010A	
310-179710-11	MW-310	Total/NA	Water	3010A	
310-179710-12	MW-310A	Total/NA	Water	3010A	

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# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Metals (Continued)

### Prep Batch: 276012 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-13	MW-311	Total/NA	Water	3010A	
310-179710-14	MW-311A	Total/NA	Water	3010A	
MB 310-276012/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Analysis Batch: 276156

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	7470A	275975
310-179710-3	MW-303	Total/NA	Water	7470A	275975
310-179710-4	MW-304	Total/NA	Water	7470A	275975
310-179710-5	MW-305	Total/NA	Water	7470A	275975
310-179710-6	MW-305A	Total/NA	Water	7470A	275975
310-179710-7	MW-306	Total/NA	Water	7470A	275975
310-179710-11	MW-310	Total/NA	Water	7470A	275975
310-179710-12	MW-310A	Total/NA	Water	7470A	275975
310-179710-13	MW-311	Total/NA	Water	7470A	275975
310-179710-14	MW-311A	Total/NA	Water	7470A	275976
MB 310-275975/1-A	Method Blank	Total/NA	Water	7470A	275975
MB 310-275976/1-A	Method Blank	Total/NA	Water	7470A	275976
LCS 310-275975/2-A	Lab Control Sample	Total/NA	Water	7470A	275975
LCS 310-275976/2-A	Lab Control Sample	Total/NA	Water	7470A	275976
310-179710-14 MS	MW-311A	Total/NA	Water	7470A	275976
310-179710-14 MSD	MW-311A	Total/NA	Water	7470A	275976

### Analysis Batch: 276475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	6020A	276012
310-179710-3	MW-303	Total/NA	Water	6020A	276012
310-179710-4	MW-304	Total/NA	Water	6020A	276012
310-179710-5	MW-305	Total/NA	Water	6020A	276012
310-179710-6	MW-305A	Total/NA	Water	6020A	276012
310-179710-7	MW-306	Total/NA	Water	6020A	276012
310-179710-11	MW-310	Total/NA	Water	6020A	276012
310-179710-12	MW-310A	Total/NA	Water	6020A	276012
310-179710-13	MW-311	Total/NA	Water	6020A	276012
310-179710-14	MW-311A	Total/NA	Water	6020A	276012
MB 310-276012/1-A	Method Blank	Total/NA	Water	6020A	276012
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	6020A	276012

## General Chemistry

### Analysis Batch: 275892

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	SM 4500 H+ B	
310-179710-3	MW-303	Total/NA	Water	SM 4500 H+ B	
310-179710-4	MW-304	Total/NA	Water	SM 4500 H+ B	
310-179710-5	MW-305	Total/NA	Water	SM 4500 H+ B	
310-179710-6	MW-305A	Total/NA	Water	SM 4500 H+ B	
310-179710-7	MW-306	Total/NA	Water	SM 4500 H+ B	
310-179710-11	MW-310	Total/NA	Water	SM 4500 H+ B	
310-179710-12	MW-310A	Total/NA	Water	SM 4500 H+ B	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## General Chemistry (Continued)

### Analysis Batch: 275892 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-13	MW-311	Total/NA	Water	SM 4500 H+ B	
310-179710-14	MW-311A	Total/NA	Water	SM 4500 H+ B	
LCS 310-275892/24	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 275971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	SM 2540C	
310-179710-3	MW-303	Total/NA	Water	SM 2540C	
310-179710-4	MW-304	Total/NA	Water	SM 2540C	
310-179710-5	MW-305	Total/NA	Water	SM 2540C	
310-179710-6	MW-305A	Total/NA	Water	SM 2540C	
310-179710-7	MW-306	Total/NA	Water	SM 2540C	
310-179710-11	MW-310	Total/NA	Water	SM 2540C	
310-179710-12	MW-310A	Total/NA	Water	SM 2540C	
310-179710-13	MW-311	Total/NA	Water	SM 2540C	
310-179710-14	MW-311A	Total/NA	Water	SM 2540C	
MB 310-275971/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-275971/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-179710-2 DU	MW-302	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 276362

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	Field Sampling	
310-179710-3	MW-303	Total/NA	Water	Field Sampling	
310-179710-4	MW-304	Total/NA	Water	Field Sampling	
310-179710-5	MW-305	Total/NA	Water	Field Sampling	
310-179710-6	MW-305A	Total/NA	Water	Field Sampling	
310-179710-7	MW-306	Total/NA	Water	Field Sampling	
310-179710-11	MW-310	Total/NA	Water	Field Sampling	
310-179710-12	MW-310A	Total/NA	Water	Field Sampling	
310-179710-13	MW-311	Total/NA	Water	Field Sampling	
310-179710-14	MW-311A	Total/NA	Water	Field Sampling	



# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

**Date Collected: 04/14/20 17:00**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/16/20 23:58	ACJ	TAL CF
Total/NA	Analysis	9056A		20	276088	04/17/20 08:30	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:12	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:06	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:08	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 17:00	ANO	TAL CF

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

**Date Collected: 04/14/20 15:50**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 00:13	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:15	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:08	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:09	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 15:50	ANO	TAL CF

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

**Date Collected: 04/13/20 17:05**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 00:29	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:19	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:11	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:10	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/13/20 17:05	ANO	TAL CF

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

**Date Collected: 04/13/20 14:50**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 00:45	ACJ	TAL CF

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# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-305

Lab Sample ID: 310-179710-5

Date Collected: 04/13/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:22	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:13	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:11	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/13/20 14:50	ANO	TAL CF

## Client Sample ID: MW-305A

Lab Sample ID: 310-179710-6

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 01:00	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:25	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:15	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:12	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 10:15	ANO	TAL CF

## Client Sample ID: MW-306

Lab Sample ID: 310-179710-7

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 01:16	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:31	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:17	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:13	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 14:50	ANO	TAL CF

## Client Sample ID: MW-310

Lab Sample ID: 310-179710-11

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 02:18	ACJ	TAL CF
Total/NA	Analysis	9056A		20	276088	04/17/20 02:34	ACJ	TAL CF

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Client Sample ID: MW-310

## Lab Sample ID: 310-179710-11

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:58	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:38	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:23	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/13/20 10:10	ANO	TAL CF

## Client Sample ID: MW-310A

## Lab Sample ID: 310-179710-12

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 02:49	ACJ	TAL CF
Total/NA	Analysis	9056A		20	276088	04/17/20 03:05	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:01	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:40	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:24	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/14/20 09:40	ANO	TAL CF

## Client Sample ID: MW-311

## Lab Sample ID: 310-179710-13

Date Collected: 04/13/20 12:40

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 03:21	ACJ	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:05	SAD	TAL CF
Total/NA	Prep	7470A			275975	04/16/20 13:19	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:42	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:24	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/13/20 12:40	ANO	TAL CF

## Client Sample ID: MW-311A

## Lab Sample ID: 310-179710-14

Date Collected: 04/13/20 08:35

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	276088	04/17/20 03:37	ACJ	TAL CF
Total/NA	Analysis	9056A		20	276088	04/17/20 03:53	ACJ	TAL CF

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

**Date Collected: 04/13/20 08:35**

**Matrix: Water**

**Date Received: 04/16/20 08:15**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:08	SAD	TAL CF
Total/NA	Prep	7470A			275976	04/16/20 13:20	HIS	TAL CF
Total/NA	Analysis	7470A		1	276156	04/17/20 14:49	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	275971	04/16/20 12:43	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	275892	04/15/20 22:27	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	276362	04/13/20 08:35	ANO	TAL CF

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-4

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Eurofins TestAmerica, Cedar Falls



Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

Client Information			
Client: SCS Eng.			
City/State: <small>CITY</small> Madison	<small>STATE</small> WI	Project: Ottumura Generating Station	
Receipt Information			
Date/Time Received: <small>DATE</small> 4-15-20	<small>TIME</small> 1740	Received By: LAB	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N	Correction Factor (°C): 10.0		
• Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 2.4	Corrected Temp (°C): 2.4		
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C

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Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			





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### Cooler/Sample Receipt and Temperature Log Form

Client Information		
Client: SCS Eng.		
City/State: <small>CITY</small> Madison	<small>STATE</small> WI	Project: Ottumura Generating Station
Receipt Information		
Date/Time Received: <small>DATE</small> 4-15-20	<small>TIME</small> 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: N	Correction Factor (°C): 10.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): 4.5	Corrected Temp (°C): 4.5	
• Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		



**Chain of Custody Record**

<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: [Redacted] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: [Redacted]		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carmer Tracking No(s): COC No: 310-48977-15135.1 Page: Page 1 of 2 Job #:	
Due Date Requested: TAT Requested (days): PO #: 25220072 WO #: Project #: 31011020 SSONW#:		<b>Analysis Requested</b> Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No) 903.0, 904.0 5020A, 7470A 2540C_Calcd, 9056A_ORGM_2BD, SM4500_H+	
<b>Sample Identification</b>		Total Number of Containers:	
Sample ID MW-301 MW-302 MW-303 MW-304 MW-305 MW-305a MW-306 MW-307 MW-308 MW-309 MW-310	Sample Date 4/14/20 4/14/20 4/14/20 4/13/20 4/13/20 4/14/20 4/14/20 4/14/20 4/14/20 4/13/20	Sample Time 1745 1700 1550 1705 1450 1015 1450 1140 1240 1350 1010	Matrix (W=water, S=solid, O=ore/slag, A=air) Preservation Code: G Water G Water G Water G Water G Water G Water G Water G Water G Water G Water G Water G Water
<b>Possible Hazard Identification</b> <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers	
<b>Deliverable Requested:</b> I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: <i>[Signature]</i> Relinquished by: <i>[Signature]</i> Relinquished by:		Received by: <i>[Signature]</i> Received by: Received by:	
Date/Time: 4/15/2020 1400 Date/Time: Date/Time:		Date/Time: 4-15-20 1740 Date/Time: Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	



Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072.00\Data and Calculations\Field Work Requests\OGS\_CCR\_Rule\_Sampling\_2004.xls\$Sheet1

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

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# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-4

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072.00**  
**April 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (umhos/cm)	ORP (mV)	Turbidity
MW-301	4/14/20 - 1745	683.25	8.7	6.58	5.14	939	176.3	0.87
MW-302	4/14/20 - 1700	656.45	10.5	6.70	0.22	1971	135.6	31.1
MW-303	1/14/20 - 1550	654.08	8.9	6.98	1.94	1097	104.3	12.1
MW-304	4/13/20 - 1705	656.42	11.9	7.12	0.24	1764	-119.8	54.1
MW-305	4/13/20 - 1450	662.44	9.1	7.00	0.28	1772	6.6	21.7
MW-305A	4/14/20 - 1015	N/A	11.2	7.63	2.26	807	106.7	4.91
MW-306	4/14/20 - 1450	670.71	11.7	6.68	0.21	1158	49.7	15.7
MW-307	4/14/20 - 1140	650.66	10.6	6.76	0.69	1554	-52.9	28.9
MW-308	4/14/20 - 1240	650.09	10.9	6.90	0.28	1502	-69.1	5.12
MW-309	4/14/20 - 1350	649.19	11.2	7.21	0.16	1322	-51.5	100.1
MW-310	4/13/20 - 1010	645.91	10.3	7.00	0.22	1823	179.4	0.87
MW-310A	4/14/20 - 0940	N/A	8.8	7.85	6.39	2915	146.1	NA
MW-311	4/13/20 - 1240	646.79	8.8	6.86	0.29	912	103.4	0.44
MW-311A	4/14/20 - 0835	N/A	7.9	8.40	3.87	3027	115.8	3.19

Abbreviations:  
mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed

Notes:  
none

Created by: KAK      Date: 5/1/2017  
Last revision by: LWJ      Date: 4/19/2020  
Checked by: AJR      Date: 4/20/2020

C:\Users\Fredrick\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.Outlook\OUR50TNS\OGS\_CCR\_Field\_2020\_April.xlsx\GW Field Parameters





## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-179710-5

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
4/22/2020 10:54:29 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

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**Job ID: 310-179710-5**

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**Laboratory: Eurofins TestAmerica, Cedar Falls**

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**Narrative**

**Job Narrative**  
**310-179710-5**

**Comments**

No additional comments.

**Receipt**

The samples were received on 4/16/2020 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.3° C, 2.6° C and 4.5° C.

**Metals**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

**General Chemistry**

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-179710-2	MW-302	Water	04/14/20 17:00	04/16/20 08:15	
310-179710-3	MW-303	Water	04/14/20 15:50	04/16/20 08:15	
310-179710-4	MW-304	Water	04/13/20 17:05	04/16/20 08:15	
310-179710-5	MW-305	Water	04/13/20 14:50	04/16/20 08:15	
310-179710-6	MW-305A	Water	04/14/20 10:15	04/16/20 08:15	
310-179710-7	MW-306	Water	04/14/20 14:50	04/16/20 08:15	
310-179710-11	MW-310	Water	04/13/20 10:10	04/16/20 08:15	
310-179710-12	MW-310A	Water	04/14/20 09:40	04/16/20 08:15	
310-179710-13	MW-311	Water	04/13/20 12:40	04/16/20 08:15	
310-179710-14	MW-311A	Water	04/13/20 08:35	04/16/20 08:15	

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Client Sample ID: MW-302

## Lab Sample ID: 310-179710-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	500		100	50	ug/L	1		6020A	Total/NA
Magnesium	50000		500	100	ug/L	1		6020A	Total/NA
Manganese	200		10	4.0	ug/L	1		6020A	Total/NA
Potassium	1500		500	150	ug/L	1		6020A	Total/NA
Sodium	250000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	0.81		0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	110		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	61		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	61		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-303

## Lab Sample ID: 310-179710-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	280		100	50	ug/L	1		6020A	Total/NA
Magnesium	23000		500	100	ug/L	1		6020A	Total/NA
Manganese	260		10	4.0	ug/L	1		6020A	Total/NA
Potassium	960		500	150	ug/L	1		6020A	Total/NA
Sodium	100000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	0.37	J	0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	220		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	440		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	440		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-304

## Lab Sample ID: 310-179710-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	5200		100	50	ug/L	1		6020A	Total/NA
Magnesium	43000		500	100	ug/L	1		6020A	Total/NA
Manganese	3700		10	4.0	ug/L	1		6020A	Total/NA
Potassium	7700		500	150	ug/L	1		6020A	Total/NA
Sodium	210000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	0.37	J	0.50	0.091	ug/L	1		6020A	Dissolved
Iron	4600		100	50	ug/L	1		6020A	Dissolved
Manganese	3700		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	370		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	370		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-305

## Lab Sample ID: 310-179710-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	330		100	50	ug/L	1		6020A	Total/NA
Magnesium	47000		500	100	ug/L	1		6020A	Total/NA
Manganese	3300		10	4.0	ug/L	1		6020A	Total/NA
Potassium	7600		500	150	ug/L	1		6020A	Total/NA
Sodium	210000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	16		0.50	0.091	ug/L	1		6020A	Dissolved
Iron	66	J	100	50	ug/L	1		6020A	Dissolved
Manganese	3400		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	460		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	460		5.0	1.9	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Client Sample ID: MW-305A

## Lab Sample ID: 310-179710-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	64	J	100	50	ug/L	1		6020A	Total/NA
Magnesium	28000		500	100	ug/L	1		6020A	Total/NA
Manganese	260		10	4.0	ug/L	1		6020A	Total/NA
Potassium	3800		500	150	ug/L	1		6020A	Total/NA
Sodium	46000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	2.8		0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	240		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	270		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	270		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-306

## Lab Sample ID: 310-179710-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	590		100	50	ug/L	1		6020A	Total/NA
Magnesium	26000		500	100	ug/L	1		6020A	Total/NA
Manganese	16000		40	16	ug/L	4		6020A	Total/NA
Potassium	3700		500	150	ug/L	1		6020A	Total/NA
Sodium	160000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	5.4		0.50	0.091	ug/L	1		6020A	Dissolved
Iron	140		100	50	ug/L	1		6020A	Dissolved
Manganese	16000		40	16	ug/L	4		6020A	Dissolved
Total Alkalinity as CaCO3	280		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	280		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-179710-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	86000		500	100	ug/L	1		6020A	Total/NA
Manganese	280		10	4.0	ug/L	1		6020A	Total/NA
Potassium	12000		500	150	ug/L	1		6020A	Total/NA
Sodium	100000		1000	520	ug/L	1		6020A	Total/NA
Cobalt	0.23	J	0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	280		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	190		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	190		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-179710-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	230		100	50	ug/L	1		6020A	Total/NA
Magnesium	41000		500	100	ug/L	1		6020A	Total/NA
Manganese	38		10	4.0	ug/L	1		6020A	Total/NA
Potassium	9900		500	150	ug/L	1		6020A	Total/NA
Sodium	630000		4000	2100	ug/L	4		6020A	Total/NA
Cobalt	0.40	J	0.50	0.091	ug/L	1		6020A	Dissolved
Iron	220		100	50	ug/L	1		6020A	Dissolved
Manganese	39		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	320		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	320		5.0	1.9	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Client Sample ID: MW-311

## Lab Sample ID: 310-179710-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	40000		500	100	ug/L	1		6020A	Total/NA
Manganese	41		10	4.0	ug/L	1		6020A	Total/NA
Potassium	620		500	150	ug/L	1		6020A	Total/NA
Sodium	5000		1000	520	ug/L	1		6020A	Total/NA
Manganese	39		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	460		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	460		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-311A

## Lab Sample ID: 310-179710-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	23000		500	100	ug/L	1		6020A	Total/NA
Manganese	13		10	4.0	ug/L	1		6020A	Total/NA
Potassium	9000		500	150	ug/L	1		6020A	Total/NA
Sodium	710000		4000	2100	ug/L	4		6020A	Total/NA
Cobalt	0.12	J	0.50	0.091	ug/L	1		6020A	Dissolved
Manganese	22		10	4.0	ug/L	1		6020A	Dissolved
Total Alkalinity as CaCO3	360		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Bicarbonate Alkalinity as CaCO3	360		5.0	1.9	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

Date Collected: 04/14/20 17:00

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	500		100	50	ug/L		04/17/20 08:00	04/21/20 12:12	1
Magnesium	50000		500	100	ug/L		04/17/20 08:00	04/21/20 12:12	1
Manganese	200		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:12	1
Potassium	1500		500	150	ug/L		04/17/20 08:00	04/21/20 12:12	1
Sodium	250000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:12	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.81		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:23	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 14:23	1
Manganese	110		10	4.0	ug/L		04/17/20 08:00	04/21/20 14:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	61		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	61		5.0	1.9	mg/L			04/17/20 10:32	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

Date Collected: 04/14/20 15:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	280		100	50	ug/L		04/17/20 08:00	04/21/20 12:15	1
Magnesium	23000		500	100	ug/L		04/17/20 08:00	04/21/20 12:15	1
Manganese	260		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:15	1
Potassium	960		500	150	ug/L		04/17/20 08:00	04/21/20 12:15	1
Sodium	100000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:15	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.37	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:26	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 14:26	1
Manganese	220		10	4.0	ug/L		04/17/20 08:00	04/21/20 14:26	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	440		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	440		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

Date Collected: 04/13/20 17:05

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	5200		100	50	ug/L		04/17/20 08:00	04/21/20 12:19	1
Magnesium	43000		500	100	ug/L		04/17/20 08:00	04/21/20 12:19	1
Manganese	3700		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:19	1
Potassium	7700		500	150	ug/L		04/17/20 08:00	04/21/20 12:19	1
Sodium	210000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:19	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.37	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:30	1
Iron	4600		100	50	ug/L		04/17/20 08:00	04/21/20 14:30	1
Manganese	3700		10	4.0	ug/L		04/17/20 08:00	04/21/20 14:30	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	370		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	370		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

Date Collected: 04/13/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	330		100	50	ug/L		04/17/20 08:00	04/21/20 12:22	1
Magnesium	47000		500	100	ug/L		04/17/20 08:00	04/21/20 12:22	1
Manganese	3300		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:22	1
Potassium	7600		500	150	ug/L		04/17/20 08:00	04/21/20 12:22	1
Sodium	210000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:22	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	16		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:33	1
Iron	66	J	100	50	ug/L		04/17/20 08:00	04/21/20 14:33	1
Manganese	3400		10	4.0	ug/L		04/17/20 08:00	04/21/20 14:33	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	460		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	460		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-179710-6**

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	64	J	100	50	ug/L		04/17/20 08:00	04/21/20 12:25	1
Magnesium	28000		500	100	ug/L		04/17/20 08:00	04/21/20 12:25	1
Manganese	260		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:25	1
Potassium	3800		500	150	ug/L		04/17/20 08:00	04/21/20 12:25	1
Sodium	46000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:25	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	2.8		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:36	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 14:36	1
Manganese	240		10	4.0	ug/L		04/17/20 08:00	04/21/20 14:36	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	270		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	270		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-306**

**Lab Sample ID: 310-179710-7**

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	590		100	50	ug/L		04/17/20 08:00	04/21/20 12:31	1
Magnesium	26000		500	100	ug/L		04/17/20 08:00	04/21/20 12:31	1
Manganese	16000		40	16	ug/L		04/17/20 08:00	04/21/20 13:15	4
Potassium	3700		500	150	ug/L		04/17/20 08:00	04/21/20 12:31	1
Sodium	160000		1000	520	ug/L		04/17/20 08:00	04/21/20 12:31	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	5.4		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 14:39	1
Iron	140		100	50	ug/L		04/17/20 08:00	04/21/20 14:39	1
Manganese	16000		40	16	ug/L		04/17/20 08:00	04/21/20 14:43	4

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	280		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	280		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-310**

**Lab Sample ID: 310-179710-11**

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 12:58	1
<b>Magnesium</b>	<b>86000</b>		500	100	ug/L		04/17/20 08:00	04/21/20 12:58	1
<b>Manganese</b>	<b>280</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 12:58	1
<b>Potassium</b>	<b>12000</b>		500	150	ug/L		04/17/20 08:00	04/21/20 12:58	1
<b>Sodium</b>	<b>100000</b>		1000	520	ug/L		04/17/20 08:00	04/21/20 12:58	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Cobalt</b>	<b>0.23</b>	<b>J</b>	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 15:06	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 15:06	1
<b>Manganese</b>	<b>280</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 15:06	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Alkalinity as CaCO3</b>	<b>190</b>		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>190</b>		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-179710-12**

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	230		100	50	ug/L		04/17/20 08:00	04/21/20 13:01	1
Magnesium	41000		500	100	ug/L		04/17/20 08:00	04/21/20 13:01	1
Manganese	38		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:01	1
Potassium	9900		500	150	ug/L		04/17/20 08:00	04/21/20 13:01	1
Sodium	630000		4000	2100	ug/L		04/17/20 08:00	04/21/20 13:28	4

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	0.40	J	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 15:13	1
Iron	220		100	50	ug/L		04/17/20 08:00	04/21/20 15:13	1
Manganese	39		10	4.0	ug/L		04/17/20 08:00	04/21/20 15:13	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	320		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	320		5.0	1.9	mg/L			04/17/20 10:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-311**

**Lab Sample ID: 310-179710-13**

Date Collected: 04/13/20 12:40

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Magnesium</b>	<b>40000</b>		500	100	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Manganese</b>	<b>41</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Potassium</b>	<b>620</b>		500	150	ug/L		04/17/20 08:00	04/21/20 13:05	1
<b>Sodium</b>	<b>5000</b>		1000	520	ug/L		04/17/20 08:00	04/21/20 13:05	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 15:19	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 15:19	1
<b>Manganese</b>	<b>39</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 15:19	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Alkalinity as CaCO3</b>	<b>460</b>		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>460</b>		5.0	1.9	mg/L			04/17/20 10:32	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

Date Collected: 04/13/20 08:35

Matrix: Water

Date Received: 04/16/20 08:15

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:08	1
<b>Magnesium</b>	<b>23000</b>		500	100	ug/L		04/17/20 08:00	04/21/20 13:08	1
<b>Manganese</b>	<b>13</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:08	1
<b>Potassium</b>	<b>9000</b>		500	150	ug/L		04/17/20 08:00	04/21/20 13:08	1
<b>Sodium</b>	<b>710000</b>		4000	2100	ug/L		04/17/20 08:00	04/21/20 13:31	4

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Cobalt</b>	<b>0.12</b>	<b>J</b>	0.50	0.091	ug/L		04/17/20 08:00	04/21/20 15:23	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 15:23	1
<b>Manganese</b>	<b>22</b>		10	4.0	ug/L		04/17/20 08:00	04/21/20 15:23	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Alkalinity as CaCO3</b>	<b>360</b>		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>360</b>		5.0	1.9	mg/L			04/17/20 10:32	1



# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Qualifiers

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-276012/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 11:30	1
Magnesium	<100		500	100	ug/L		04/17/20 08:00	04/21/20 11:30	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 11:30	1
Potassium	<150		500	150	ug/L		04/17/20 08:00	04/21/20 11:30	1
Sodium	<520		1000	520	ug/L		04/17/20 08:00	04/21/20 11:30	1

**Lab Sample ID: LCS 310-276012/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276012**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	4000	4040		ug/L		101	80 - 120
Magnesium	4000	4320		ug/L		108	80 - 120
Manganese	400	418		ug/L		105	80 - 120
Potassium	4000	4090		ug/L		102	80 - 120
Sodium	4000	3990		ug/L		100	80 - 120

**Lab Sample ID: MB 310-276015/1-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 276015**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		04/17/20 08:00	04/21/20 13:45	1
Iron	<50		100	50	ug/L		04/17/20 08:00	04/21/20 13:45	1
Manganese	<4.0		10	4.0	ug/L		04/17/20 08:00	04/21/20 13:45	1

**Lab Sample ID: LCS 310-276015/2-A**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 276015**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	40.0	40.6		ug/L		102	80 - 120
Iron	4000	4040		ug/L		101	80 - 120
Manganese	400	427		ug/L		107	80 - 120

**Lab Sample ID: 310-179710-11 DU**  
**Matrix: Water**  
**Analysis Batch: 276475**

**Client Sample ID: MW-310**  
**Prep Type: Dissolved**  
**Prep Batch: 276015**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cobalt	0.23	J	0.232	J	ug/L		3	20
Iron	<50		<50		ug/L		NC	20
Manganese	280		279		ug/L		0.9	20

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-276083/1**  
**Matrix: Water**  
**Analysis Batch: 276083**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			04/17/20 10:32	1

**Lab Sample ID: LCS 310-276083/2**  
**Matrix: Water**  
**Analysis Batch: 276083**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3	1000	946		mg/L		95	90 - 110

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Metals

### Prep Batch: 276012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	3010A	
310-179710-3	MW-303	Total/NA	Water	3010A	
310-179710-4	MW-304	Total/NA	Water	3010A	
310-179710-5	MW-305	Total/NA	Water	3010A	
310-179710-6	MW-305A	Total/NA	Water	3010A	
310-179710-7	MW-306	Total/NA	Water	3010A	
310-179710-11	MW-310	Total/NA	Water	3010A	
310-179710-12	MW-310A	Total/NA	Water	3010A	
310-179710-13	MW-311	Total/NA	Water	3010A	
310-179710-14	MW-311A	Total/NA	Water	3010A	
MB 310-276012/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Prep Batch: 276015

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Dissolved	Water	3010A	
310-179710-3	MW-303	Dissolved	Water	3010A	
310-179710-4	MW-304	Dissolved	Water	3010A	
310-179710-5	MW-305	Dissolved	Water	3010A	
310-179710-6	MW-305A	Dissolved	Water	3010A	
310-179710-7	MW-306	Dissolved	Water	3010A	
310-179710-11	MW-310	Dissolved	Water	3010A	
310-179710-12	MW-310A	Dissolved	Water	3010A	
310-179710-13	MW-311	Dissolved	Water	3010A	
310-179710-14	MW-311A	Dissolved	Water	3010A	
MB 310-276015/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-276015/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-179710-11 DU	MW-310	Dissolved	Water	3010A	

### Analysis Batch: 276475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Dissolved	Water	6020A	276015
310-179710-2	MW-302	Total/NA	Water	6020A	276012
310-179710-3	MW-303	Dissolved	Water	6020A	276015
310-179710-3	MW-303	Total/NA	Water	6020A	276012
310-179710-4	MW-304	Dissolved	Water	6020A	276015
310-179710-4	MW-304	Total/NA	Water	6020A	276012
310-179710-5	MW-305	Dissolved	Water	6020A	276015
310-179710-5	MW-305	Total/NA	Water	6020A	276012
310-179710-6	MW-305A	Dissolved	Water	6020A	276015
310-179710-6	MW-305A	Total/NA	Water	6020A	276012
310-179710-7	MW-306	Dissolved	Water	6020A	276015
310-179710-7	MW-306	Dissolved	Water	6020A	276015
310-179710-7	MW-306	Total/NA	Water	6020A	276012
310-179710-7	MW-306	Total/NA	Water	6020A	276012
310-179710-11	MW-310	Dissolved	Water	6020A	276015
310-179710-11	MW-310	Total/NA	Water	6020A	276012
310-179710-12	MW-310A	Dissolved	Water	6020A	276015
310-179710-12	MW-310A	Total/NA	Water	6020A	276012
310-179710-12	MW-310A	Total/NA	Water	6020A	276012
310-179710-13	MW-311	Dissolved	Water	6020A	276015

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Metals (Continued)

### Analysis Batch: 276475 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-13	MW-311	Total/NA	Water	6020A	276012
310-179710-14	MW-311A	Dissolved	Water	6020A	276015
310-179710-14	MW-311A	Total/NA	Water	6020A	276012
310-179710-14	MW-311A	Total/NA	Water	6020A	276012
MB 310-276012/1-A	Method Blank	Total/NA	Water	6020A	276012
MB 310-276015/1-A	Method Blank	Total/NA	Water	6020A	276015
LCS 310-276012/2-A	Lab Control Sample	Total/NA	Water	6020A	276012
LCS 310-276015/2-A	Lab Control Sample	Total/NA	Water	6020A	276015
310-179710-11 DU	MW-310	Dissolved	Water	6020A	276015

## General Chemistry

### Analysis Batch: 276083

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-179710-2	MW-302	Total/NA	Water	SM 2320B	
310-179710-3	MW-303	Total/NA	Water	SM 2320B	
310-179710-4	MW-304	Total/NA	Water	SM 2320B	
310-179710-5	MW-305	Total/NA	Water	SM 2320B	
310-179710-6	MW-305A	Total/NA	Water	SM 2320B	
310-179710-7	MW-306	Total/NA	Water	SM 2320B	
310-179710-11	MW-310	Total/NA	Water	SM 2320B	
310-179710-12	MW-310A	Total/NA	Water	SM 2320B	
310-179710-13	MW-311	Total/NA	Water	SM 2320B	
310-179710-14	MW-311A	Total/NA	Water	SM 2320B	
MB 310-276083/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-276083/2	Lab Control Sample	Total/NA	Water	SM 2320B	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-302**

**Lab Sample ID: 310-179710-2**

Date Collected: 04/14/20 17:00

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:23	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:12	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-303**

**Lab Sample ID: 310-179710-3**

Date Collected: 04/14/20 15:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:26	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:15	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-304**

**Lab Sample ID: 310-179710-4**

Date Collected: 04/13/20 17:05

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:30	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:19	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-305**

**Lab Sample ID: 310-179710-5**

Date Collected: 04/13/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:33	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:22	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-179710-6**

Date Collected: 04/14/20 10:15

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:36	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:25	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-306**

**Lab Sample ID: 310-179710-7**

Date Collected: 04/14/20 14:50

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 14:39	SAD	TAL CF
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		4	276475	04/21/20 14:43	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:31	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		4	276475	04/21/20 13:15	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-310**

**Lab Sample ID: 310-179710-11**

Date Collected: 04/13/20 10:10

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 15:06	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 12:58	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-179710-12**

Date Collected: 04/14/20 09:40

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 15:13	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:01	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		4	276475	04/21/20 13:28	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

Eurofins TestAmerica, Cedar Falls



# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

**Client Sample ID: MW-311**

**Lab Sample ID: 310-179710-13**

Date Collected: 04/13/20 12:40

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 15:19	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:05	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-179710-14**

Date Collected: 04/13/20 08:35

Matrix: Water

Date Received: 04/16/20 08:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			276015	04/17/20 08:00	HED	TAL CF
Dissolved	Analysis	6020A		1	276475	04/21/20 15:23	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		1	276475	04/21/20 13:08	SAD	TAL CF
Total/NA	Prep	3010A			276012	04/17/20 08:00	HED	TAL CF
Total/NA	Analysis	6020A		4	276475	04/21/20 13:31	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	276083	04/17/20 10:32	WJF	TAL CF

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-179710-5

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





Environment Testing  
TestAmerica



310-179710 Chain of Custody

**Cooler/Sample Receipt and Temperature Log**

**Client Information**

Client: SCS Eng.  
 City/State: Madison CITY WI STATE Project: Ottumwa Generating Station

**Receipt Information**

Date/Time Received: 4-15-20 DATE 1740 TIME Received By: LAB  
 Delivery Type:  UPS  FedEx  FedEx Ground  US Mail  Spee-Dee  
 Lab Courier  Lab Field Services  Client Drop-off  Other: \_\_\_\_\_

**Condition of Cooler/Containers**

Sample(s) received in Cooler?  Yes  No If yes: Cooler ID: \_\_\_\_\_  
 Multiple Coolers?  Yes  No If yes: Cooler # 1 of 3  
 Cooler Custody Seals Present?  Yes  No If yes: Cooler custody seals intact?  Yes  No  
 Sample Custody Seals Present?  Yes  No If yes: Sample custody seals intact?  Yes  No  
 Trip Blank Present?  Yes  No If yes: Which VOA samples are in cooler? ↓

**Temperature Record**

Coolant:  Wet ice  Blue ice  Dry ice  Other: \_\_\_\_\_  NONE  
 Thermometer ID: N Correction Factor (°C): +0.0  
 • Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature  
 Uncorrected Temp (°C): 2.4 Corrected Temp (°C): 2.4

**Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

**Exceptions Noted**

1) If temperature exceeds criteria, was sample(s) received same day of sampling?  Yes  No  
 a) If yes: Is there evidence that the chilling process began?  Yes  No  
 2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)  Yes  No

NOTE: If yes, contact PM before proceeding. If no, proceed with login

**Additional Comments**

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





Environment Testing  
TestAmerica

Place COC scanning label  
here

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**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: SCS Eng.			
City/State:	CITY Madison	STATE WI	Project: Ottumura Generating Station
Receipt Information			
Date/Time Received:	DATE 4-15-20	TIME 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: N		Correction Factor (°C): +0.6	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): 1.3		Corrected Temp (°C): 1.3	
• Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

1  
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**Cooler/Sample Receipt and Temperature Log Form**

Client Information		
Client: SCS Eng.		
City/State: <small>CITY</small> Madison	<small>STATE</small> WI	Project: Ottumwa Generating Station
Receipt Information		
Date/Time Received: <small>DATE</small> 4-15-20	<small>TIME</small> 1740	Received By: LAB
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____		
Condition of Cooler/Containers		
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>3</u> of <u>3</u>
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record		
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID: N	Correction Factor (°C): 10.0	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature		
Uncorrected Temp (°C): 4.5	Corrected Temp (°C): 4.5	
• Sample Container Temperature		
Container(s) used:	CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):		
Corrected Temp (°C):		
Exceptions Noted		
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No		
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No		
NOTE: If yes, contact PM before proceeding. If no, proceed with login		
Additional Comments		

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**Chain of Custody Record**

<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State, Zip: WI, 53718 Phone: [Redacted] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: [Redacted]		Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com Carmer Tracking No(s): COC No: 310-48977-15135.1 Page: Page 1 of 2 Job #:					
Due Date Requested: TAT Requested (days): PO #: 25220072 WO #: Project #: 31011020 SSONW#:		<b>Analysis Requested</b> Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No) 903.0, 904.0 5020A, 7470A 2540C_Calcd, 9056A_ORGM_2BD, SM4500_H+					
<b>Sample Identification</b> MW-301 MW-302 MW-303 MW-304 MW-305 MW-305a MW-306 MW-307 MW-308 MW-309 MW-310	Sample Date 4/14/20 4/14/20 4/14/20 4/13/20 4/13/20 4/14/20 4/14/20 4/14/20 4/14/20 4/13/20	Sample Time 1745 1700 1550 1705 1450 1015 1450 1140 1240 1350 1010	Sample Type (C=comp, G=grab) G G G G G G G G G G G G	Matrix (W=water, S=solid, O=ore/slag, A=air) Water Water Water Water Water Water Water Water Water Water Water Water	Preservation Code: D D D D D D D D D D D D D	Total Number of Containers X X X X X X X X X X X X X	Special Instructions/Note: Please refer to enclosed Table for correct grouping of wells on COCs This is for 3 coolers
<b>Possible Hazard Identification</b> <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological				<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b> <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Deliverable Requested: I, II, III, IV, Other (specify)				Special Instructions/QC Requirements:			
Empty Kit Relinquished by:				Method of Shipment:			
Relinquished by: <i>[Signature]</i>		Date: 4/15/2020 1400		Company: SCS		Received by: <i>[Signature]</i>	
Relinquished by:		Date:		Company:		Received by:	
Relinquished by:		Date:		Company:		Received by:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			





Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072

Parameter	COC #1		COC #3										COC #4			TOTAL	
	MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309		
<b>Appendix III Parameters</b>																	
Boron	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Appendix IV Parameters</b>																	
Antimony	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cadmium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Additional Lab Parameters</b>																	
Bicarbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (filtered)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
<b>Field Parameters</b>																	
Total Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMeis)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
ORP	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072\00\Data and Calculations\Field Work Requests\OGS\_CCR\_Rule\_Sampling\_2004.xls\$Sheet1

Temperature readings: \_\_\_\_\_

Client Sample ID	Lab ID	Container Type	Container		Preservative	
			pH	Temp	Added (mls)	Lot #
MW-301	310-179710-A-1	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-301	310-179710-B-1	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-D-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-301	310-179710-E-1	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-A-2	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-302	310-179710-B-2	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-D-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-302	310-179710-E-2	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-A-3	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-303	310-179710-B-3	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-D-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-303	310-179710-E-3	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-A-4	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-304	310-179710-B-4	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-D-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-304	310-179710-E-4	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-A-5	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305	310-179710-B-5	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-D-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305	310-179710-E-5	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-A-6	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-305A	310-179710-B-6	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-D-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-305A	310-179710-E-6	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-A-7	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-306	310-179710-B-7	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-D-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-306	310-179710-E-7	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-A-8	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-307	310-179710-B-8	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-D-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-307	310-179710-E-8	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-A-9	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-308	310-179710-B-9	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-308	310-179710-D-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container</u>		<u>Preservative</u>	
			<u>pH</u>	<u>Temp</u>	<u>Added (mls)</u>	<u>Lot #</u>
MW-308	310-179710-E-9	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-A-10	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-309	310-179710-B-10	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-D-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-309	310-179710-E-10	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-A-11	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310	310-179710-B-11	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-D-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310	310-179710-E-11	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-A-12	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-310A	310-179710-B-12	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-D-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-310A	310-179710-E-12	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-A-13	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311	310-179710-B-13	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-D-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311	310-179710-E-13	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-A-14	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
MW-311A	310-179710-B-14	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-D-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
MW-311A	310-179710-E-14	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-A-15	Plastic 250ml - w/nitric - dis	<2	_____	_____	_____
Field Blank	310-179710-B-15	Plastic 250ml - with Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-D-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____
Field Blank	310-179710-E-15	Plastic 1 liter - Nitric Acid	<2	_____	_____	_____

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## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-179710-5

**Login Number: 179710**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Lickness, Corina A**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## C4 Resample, June 2020

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-185157-1

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
7/6/2020 2:43:29 PM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

### LINKS

Review your project  
results through  
**Total Access**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

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## Job ID: 310-185157-1

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Laboratory: Eurofins TestAmerica, Cedar Falls

### Narrative

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Job Narrative  
310-185157-1

### Comments

No additional comments.

### Receipt

The samples were received on 6/30/2020 5:45 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.2° C.

### HPLC/IC

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-185157-1	MW311A	Water	06/30/20 11:30	06/30/20 17:45	
310-185157-2	Field Blank	Water	06/30/20 11:30	06/30/20 17:45	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

## Client Sample ID: MW311A

## Lab Sample ID: 310-185157-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	3.7		0.50	0.23	mg/L	5		9056A	Total/NA
Ground Water Elevation	647.73				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	23.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	1.51				mg/L	1		Field Sampling	Total/NA
pH, Field	7.64				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3391				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.6				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	1.43				NTU	1		Field Sampling	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-185157-2

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

**Client Sample ID: MW311A**

**Lab Sample ID: 310-185157-1**

Date Collected: 06/30/20 11:30

Matrix: Water

Date Received: 06/30/20 17:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	3.7		0.50	0.23	mg/L			07/01/20 20:09	5

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	647.73				ft			06/30/20 11:30	1
Oxidation Reduction Potential	23.4				millivolts			06/30/20 11:30	1
Oxygen, Dissolved, Client Supplied	1.51				mg/L			06/30/20 11:30	1
pH, Field	7.64				SU			06/30/20 11:30	1
Specific Conductance, Field	3391				umhos/cm			06/30/20 11:30	1
Temperature, Field	12.6				Degrees C			06/30/20 11:30	1
Turbidity, Field	1.43				NTU			06/30/20 11:30	1

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# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-185157-2**

**Date Collected: 06/30/20 11:30**

**Matrix: Water**

**Date Received: 06/30/20 17:45**

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.046		0.10	0.046	mg/L			07/01/20 20:25	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-283997/35**  
**Matrix: Water**  
**Analysis Batch: 283997**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.046		0.10	0.046	mg/L			07/06/20 10:35	1

**Lab Sample ID: LCS 310-283997/36**  
**Matrix: Water**  
**Analysis Batch: 283997**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.00	2.04		mg/L		102	90 - 110

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

## HPLC/IC

### Analysis Batch: 283997

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-185157-1	MW311A	Total/NA	Water	9056A	
310-185157-2	Field Blank	Total/NA	Water	9056A	
MB 310-283997/35	Method Blank	Total/NA	Water	9056A	
LCS 310-283997/36	Lab Control Sample	Total/NA	Water	9056A	

## Field Service / Mobile Lab

### Analysis Batch: 284199

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-185157-1	MW311A	Total/NA	Water	Field Sampling	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

**Client Sample ID: MW311A**

**Date Collected: 06/30/20 11:30**

**Date Received: 06/30/20 17:45**

**Lab Sample ID: 310-185157-1**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	283997	07/01/20 20:09	ACJ	TAL CF
Total/NA	Analysis	Field Sampling		1	284199	06/30/20 11:30	SJF	TAL CF

**Client Sample ID: Field Blank**

**Date Collected: 06/30/20 11:30**

**Date Received: 06/30/20 17:45**

**Lab Sample ID: 310-185157-2**

**Matrix: Water**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	283997	07/01/20 20:25	ACJ	TAL CF

## Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Eurofins TestAmerica, Cedar Falls



# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

1

2

3

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-185157-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>			
Client: <u>SCS Engineers</u>			
City/State: <u>Clive IA</u>	Project: <u>Ottumwa Generating Station</u>		
<b>Receipt Information</b>			
Date/Time Received: <u>01/30/20 1745</u>	Received By: <u>J</u>		
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Containers</b>			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>M</u>		Correction Factor (°C): <u>0.1</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.1</u>		Corrected Temp (°C): <u>0.2</u>	
<b>• Sample Container Temperature</b>			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Exceptions Noted</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comments</b>			



<b>Client Information</b> Client Contact: Meghan Bloodgett Company: SCS Engineers Address: 2830 Dairy Drive City: Madison State/Zip: WI, 53718 Phone: [blank] Email: mbloodgett@scsengineers.com Project Name: Ottumwa Generating Station 25219072 Site: <i>Ottumwa Generating Station</i>		Sampler: <i>Matthew Carndon</i> Phone: <i>515-250-0305</i> Lab PM: Fredrick, Sandie E-Mail: sandie.fredrick@testamericainc.com		COC No: 310-51414-15658-1 Page: Page 1 of 1 Job #: [blank]	
Due Date Requested: [blank] TAT Requested (days): <i>3-2day TAT</i> PO #: 25219072 WO #: [blank] Project #: 31011020 SSO#: [blank]		Carrier Tracking No(s): [blank]			
Analysis Requested: [blank]		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: [blank]			
Sample Identification MW311A Field Blank		Sample Date <i>6/30/2020</i> <i>6/30/2020</i>	Sample Time <i>1130</i> <i>1130</i>	Sample Type (C=comp, G=grab) <i>G</i> <i>G</i>	Matrix (W=water, S=solid, O=soil, BT=tissue, A=air) Water Water
Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> N Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> N 2540C_Calcd, 9056A_ORGFM_28D, SM4500_H+		Total Number of containers: [blank]			
Special Instructions/Note: <i>1 Fluoride analysis only</i> <i>1 Fluoride analysis only</i> <i>* 3-Day TAT *</i>		Special Instructions/Note: [blank]			
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Radiological					
Deliverable Requested: I, II, III, IV, Other (specify) [blank]					
Empty Kit Relinquished by: [blank] Date: [blank]					
Relinquished by: <i>Matthew Carndon</i>		Date/Time: <i>6/30/2020 1340</i>		Company: <i>SCS</i>	
Relinquished by: [blank]		Date/Time: [blank]		Company: [blank]	
Relinquished by: [blank]		Date/Time: [blank]		Company: [blank]	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks: [blank]			
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Special Instructions/QC Requirements: [blank]					
Received by: <i>Matthew Carndon</i> Date/Time: <i>6/30/2020 1715</i> Company: [blank]					
Received by: [blank] Date/Time: [blank] Company: [blank]					
Received by: [blank] Date/Time: [blank] Company: [blank]					



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-185157-1

**Login Number: 185157**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Fredrick, Sandie

---

**From:** Blodgett, Meghan <mblodgett@scsengineers.com>  
**Sent:** Monday, July 06, 2020 2:27 PM  
**To:** Fredrick, Sandie  
**Cc:** Kron, Nicole  
**Subject:** RE: Questions please 310-185157-1 Ottumwa Generating Station 25220072

EXTERNAL EMAIL\*

Sandie,

Field data for MW-311A at OGS are below.

GW elevation: 647.73 ft amsl  
Temperature: 12.6 deg C  
pH: 7.64 std. units  
Sp. Cond: 3391 us/cm  
ORP: 23.4 mV  
Turbidity: 1.43 NTU  
DO: 1.51 mg/L

Meghan Blodgett  
SCS Engineers  
Madison, WI  
608-345-9221 (C)  
[mblodgett@scsengineers.com](mailto:mblodgett@scsengineers.com)  
[www.scsengineers.com](http://www.scsengineers.com)

---

**From:** Fredrick, Sandie <Sandra.Fredrick@testamericainc.com>  
**Sent:** Monday, July 6, 2020 11:31 AM  
**To:** Valcheff, Jess <JValcheff@scsengineers.com>; Blodgett, Meghan <mblodgett@scsengineers.com>; Kron, Nicole <NKron@scsengineers.com>; Karwoski, Thomas <TKarwoski@scsengineers.com>  
**Subject:** RE: Questions please 310-185157-1 Ottumwa Generating Station 25220072

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Ditto on this set. Rush Fluoride results below. Let me know if I should cancel field data entry and report.  
Thanks!  
Sandie

MW311A – 3.7 mg/L  
Field Blank – 0.046 mg/L

Please let us know if we met your expectations by rating the service you received from TestAmerica on this project by visiting our website at: [Project Feedback](#)

We are thankful for your business and hope that you have a wonderful day!

**Sandie Fredrick**  
Project Manager

Eurofins TestAmerica  
2417 Bond Street  
University Park, IL 60484  
USA

Phone: 920-261-1660

E-mail: [sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)  
[www.EurofinsUS.com](http://www.EurofinsUS.com) | [www.TestAmericainc.com](http://www.TestAmericainc.com)

Please note: In order to continue to provide critical testing services, **Eurofins Environment Testing laboratories in the US are maintaining our courier services and continue to sample, analyze and report all test data as usual.** The situation around COVID-19 continues to be fluid and we are continuing to follow local and government mandates as applicable. For up-to-date business information, visit our website and follow us on Facebook and LinkedIn.

Links to use:

**Website:** <https://www.eurofinsus.com/environment-testing/>  
**Facebook:** <https://www.facebook.com/EurofinsEnvTesting>  
**LinkedIn:** <https://www.linkedin.com/company/eurofins-env-testing-america/>

---

**From:** Fredrick, Sandie  
**Sent:** Sunday, July 05, 2020 9:20 PM  
**To:** Jess Valcheff; Meghan Blodgett; Nicole Kron; Mr. Tom Karwoski  
**Subject:** Questions please 310-185157-1 Ottumwa Generating Station 25220072

Hello All,

Ditto for this set - I updated project number to 25220072

Do you need Field data entered?

Thanks so much,  
Sandie

Attached please find the report files for job 310-185157-1; Ottumwa Generating Station 25220072

Please feel free to contact me if you have any questions.

Thank you.

**Sandie Fredrick**

Project Manager

Eurofins TestAmerica, Chicago

Phone: 920-261-1660

E-mail: [sandie.fredrick@testamericainc.com](mailto:sandie.fredrick@testamericainc.com)

[www.eurofinsus.com/env](http://www.eurofinsus.com/env)



Reference: [500-543189]

Attachments: 1

Please let us know if we met your expectations by rating the service you received from Eurofins TestAmerica on this project by visiting our website at: [Project Feedback](#)

\* WARNING - EXTERNAL: This email originated from outside of Eurofins TestAmerica. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!



## C5 Assessment Monitoring, October 2020

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192743-1

Client Project/Site: Ottumwa Generating Station - 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
11/24/2020 12:32:04 PM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandra.fredrick@eurofinset.com](mailto:sandra.fredrick@eurofinset.com)

### LINKS

Review your project  
results through  
**Total Access**

Have a Question?



Visit us at:

[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

---

## Job ID: 310-192743-1

---

Laboratory: Eurofins TestAmerica, Cedar Falls

### Narrative

#### Job Narrative 310-192743-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/9/2020 5:40 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3° C.

#### RAD

Methods 903.0, 9315: 903/9315 prep batch 160-485829 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-192743-1) and Field Blank (310-192743-2)

Methods 904.0, 9320: 904 prep batch 485913 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-301 (310-192743-1) and Field Blank (310-192743-2)

Methods 904.0, 9320: 904/9320 prep batch 485913 The LCS recovery (127%) for Ra228 was outside the upper QC limits of 75-125. It was within our statistical upper limit of 138%. The LCSD recovered at 114% of the true value and the RER/RPD was acceptable. Original results will be qualified and reported. (LCS 160-485913/1-A)

Method PrecSep\_0: Radium 228 Prep Batch 160-485913: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-301 (310-192743-1) and Field Blank (310-192743-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-485829: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-301 (310-192743-1) and Field Blank (310-192743-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192743-1	MW-301	Water	10/08/20 09:25	10/09/20 17:40	
310-192743-2	Field Blank	Water	10/08/20 15:10	10/09/20 17:40	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

---

**Client Sample ID: MW-301**

**Lab Sample ID: 310-192743-1**

No Detections.

---

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-192743-2**

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-192743-1**

Date Collected: 10/08/20 09:25

Matrix: Water

Date Received: 10/09/20 17:40

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.324		0.201	0.203	1.00	0.254	pCi/L	10/15/20 14:39	11/11/20 21:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.9		40 - 110					10/15/20 14:39	11/11/20 21:00	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0831	U *	0.238	0.238	1.00	0.413	pCi/L	10/16/20 06:54	11/11/20 12:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.9		40 - 110					10/16/20 06:54	11/11/20 12:11	1
Y Carrier	85.6		40 - 110					10/16/20 06:54	11/11/20 12:11	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.407	U	0.312	0.313	5.00	0.413	pCi/L		11/24/20 12:22	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-192743-2**

Date Collected: 10/08/20 15:10

Matrix: Water

Date Received: 10/09/20 17:40

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0926	U	0.147	0.147	1.00	0.256	pCi/L	10/15/20 14:39	11/11/20 21:01	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					10/15/20 14:39	11/11/20 21:01	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.474	*	0.297	0.300	1.00	0.453	pCi/L	10/16/20 06:54	11/11/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110					10/16/20 06:54	11/11/20 12:29	1
Y Carrier	77.4		40 - 110					10/16/20 06:54	11/11/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.566		0.331	0.334	5.00	0.453	pCi/L		11/24/20 12:22	1





# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Qualifiers

### Rad

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-485829/23-A**  
**Matrix: Water**  
**Analysis Batch: 488915**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 485829**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.004364	U	0.145	0.145	1.00	0.301	pCi/L	10/15/20 14:39	11/11/20 21:01	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	84.8		40 - 110		10/15/20 14:39	11/11/20 21:01	1			

**Lab Sample ID: LCS 160-485829/1-A**  
**Matrix: Water**  
**Analysis Batch: 488915**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 485829**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.3	10.88		1.42	1.00	0.287	pCi/L	96	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	77.7		40 - 110						

**Lab Sample ID: LCSD 160-485829/2-A**  
**Matrix: Water**  
**Analysis Batch: 488915**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 485829**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
				Uncert. (2σ+/-)							
Radium-226	11.3	8.714		1.21	1.00	0.293	pCi/L	77	75 - 125	0.82	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	81.2		40 - 110								

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-485913/23-A**  
**Matrix: Water**  
**Analysis Batch: 488916**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 485913**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.4431		0.280	0.283	1.00	0.429	pCi/L	10/16/20 06:54	11/11/20 12:30	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	84.8		40 - 110		10/16/20 06:54	11/11/20 12:30	1			
Y Carrier	86.4		40 - 110		10/16/20 06:54	11/11/20 12:30	1			

Euofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-485913/1-A**  
**Matrix: Water**  
**Analysis Batch: 488918**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 485913**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-228	7.66	9.698	*	1.20	1.00	0.528	pCi/L	127	75 - 125	
<b>LCS LCS</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	77.7		40 - 110							
Y Carrier	77.0		40 - 110							

**Lab Sample ID: LCSD 160-485913/2-A**  
**Matrix: Water**  
**Analysis Batch: 488918**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 485913**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER Limit	
											RER	Limit
Radium-228	7.66	8.740		1.08	1.00	0.457	pCi/L	114	75 - 125	0.42	1	
<b>LCSD LCSD</b>												
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>									
Ba Carrier	81.2		40 - 110									
Y Carrier	81.5		40 - 110									

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Rad

### Prep Batch: 485829

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192743-1	MW-301	Total/NA	Water	PrecSep-21	
310-192743-2	Field Blank	Total/NA	Water	PrecSep-21	
MB 160-485829/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-485829/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-485829/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 485913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192743-1	MW-301	Total/NA	Water	PrecSep_0	
310-192743-2	Field Blank	Total/NA	Water	PrecSep_0	
MB 160-485913/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-485913/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-485913/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-192743-1**

Date Collected: 10/08/20 09:25

Matrix: Water

Date Received: 10/09/20 17:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			485829	10/15/20 14:39	AVB	TAL SL
Total/NA	Analysis	903.0		1	488915	11/11/20 21:00	SCB	TAL SL
Total/NA	Prep	PrecSep_0			485913	10/16/20 06:54	AVB	TAL SL
Total/NA	Analysis	904.0		1	488918	11/11/20 12:11	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490073	11/24/20 12:22	SCB	TAL SL

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-192743-2**

Date Collected: 10/08/20 15:10

Matrix: Water

Date Received: 10/09/20 17:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			485829	10/15/20 14:39	AVB	TAL SL
Total/NA	Analysis	903.0		1	488915	11/11/20 21:01	SCB	TAL SL
Total/NA	Prep	PrecSep_0			485913	10/16/20 06:54	AVB	TAL SL
Total/NA	Analysis	904.0		1	488916	11/11/20 12:29	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490073	11/24/20 12:22	SCB	TAL SL

**Laboratory References:**

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-20
Iowa	State	373	12-01-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
Pos			
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency  
None = None  
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566



Environment Testing  
TestAmerica



310-192743 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SCS</u>			
City/State:	CITY <u>Clive</u>	STATE <u>IA</u>	Project: <u>Ottumwa GS</u>
Receiver Information			
Date/Time Received:	DATE <u>10.9.20</u>	TIME <u>1740</u>	Received By: <u>BLM</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE	
Thermometer ID:	<u>N</u>	Correction Factor (°C): <u>+0.0</u>	
* Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<u>3.3</u>	Corrected Temp (°C): <u>3.3</u>	
Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):	<u>3.3</u>		
Corrected Temp (°C):	<u>3.3</u>		
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



Chain of Custody Record

<b>Client Information</b> Client Contact: Tanten Buszka Phone: 264-943-0855 Company: SCS Engineers		Lab PM: Fredrick, Sandie E-Mail: sandra.fredrick@eurofinset.com		Courier Tracking (No.): 310-54605-16342 1 Page 2 of 3 Job #	
Due Date Requested: TAT Requested (days): PO #: 25219072 WO #:		Analysis Requested 6020A - Metals (14) 6020A - Metals (2) 2320B - Alkalinity - Carb/Bicarb 2540C - Calcd. 9056A_ORGFM_28D_SM4500_H+		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
Address: 8450 Hickman Road Suite 207 City: Clive State: IA, Zip: 50325 Phone: 264-943-0855 Email: tbuszka@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: 065		Perform MS/MSD (Yes or No) Field Filtered Sample (Yes or No)		Special Instructions/Note: - 1 Filled metals bottle See attached Sampling points + parameters table for requested analyses	
Sample Identification MW-301 Field Blank		Sample Date: 10-8-20 Sample Time: 9:25 Matrix: Water		Total Number of containers	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Date: 10-8-20 Sample Time: 15:10 Matrix: Water		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Date: 10/9/20 1115 Company: SCS		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Date:		Method of Shipment:	
Relinquished by: Matthew Cahalan		Date/Time: 10/9/20 1700 Company: CTA		Received by:	
Relinquished by:		Date/Time:		Received by:	
Relinquished by:		Date/Time:		Received by:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	



**Table 1. Sampling Points and Parameters - CCR Rule Sampling Program**  
**Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #25216072**

	Parameter	COC Set #1 (Background)		COC Set #2 (Ash Pond)										COC Set #3 (ZLDP)			TOTAL
		MW-301	Field Blank	MW-302	MW-303	MW-304	MW-305	MW-305A	MW-306	MW-310	MW-310A	MW-311	MW-311A	MW-307	MW-308	MW-309	
Appendix III Parameters	Boron	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Calcium	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Chloride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Fluoride	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	pH	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Sulfate	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	TDS	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Appendix IV Parameters	Antimony	x	x	x	x	x	x	x	x	x	x	x	x			
Arsenic		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Barium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Beryllium																	0
Cadmium		x	x	x	x	x	x	x	x	x	x	x	x				12
Chromium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Cobalt		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Fluoride		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Lead		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Lithium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Mercury																	0
Molybdenum		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Selenium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Thallium		x	x	x	x	x	x	x	x	x	x	x	x				12
Radium		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Additional Lab Parameters - REPORT SEPARATELY	Bicarbonate (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Carbonate (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Iron (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Magnesium (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Manganese (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Potassium (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Sodium (total)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Cobalt (filtered)						x	x						x			3
	Iron (filtered)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
	Lithium (filtered)									x	x		x				3
	Manganese (filtered)	x		x	x	x	x	x	x	x	x	x	x	x	x	x	14
	Field Parameters	Total Iron (CHEMets)	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Ferrous Iron (CHEMets)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Sulfide (CHEMets)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Groundwater Elevation		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Well Depth		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
pH (field)		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Specific Conductance		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Dissolved Oxygen		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
ORP		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Temperature		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Turbidity		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Color		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15
Odor		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	15

Notes: All samples are unfiltered (total).

C:\Users\FredrickS\AppData\Local\Temp\83\OGS\_CCR\_Rule\_Sampling\_2010.xls]Sheet1

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192743-1

**Login Number: 192743**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Ramos, Eric F**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192743-1

**Login Number: 192743**

**List Source: Eurofins TestAmerica, St. Louis**

**List Number: 2**

**List Creation: 10/14/20 12:15 PM**

**Creator: Mazariegos, Leonel A**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Tracer/Carrier Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192743-1

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
310-192743-1	MW-301	88.9	
310-192743-2	Field Blank	87.7	
LCS 160-485829/1-A	Lab Control Sample	77.7	
LCSD 160-485829/2-A	Lab Control Sample Dup	81.2	
MB 160-485829/23-A	Method Blank	84.8	

**Tracer/Carrier Legend**  
Ba = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
310-192743-1	MW-301	88.9	85.6
310-192743-2	Field Blank	87.7	77.4
LCS 160-485913/1-A	Lab Control Sample	77.7	77.0
LCSD 160-485913/2-A	Lab Control Sample Dup	81.2	81.5
MB 160-485913/23-A	Method Blank	84.8	86.4

**Tracer/Carrier Legend**  
Ba = Ba Carrier  
Y = Y Carrier

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072.00**  
**October 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	10/8/20 - 905	682.34	15.4	6.22	4.2	1035	163.6	0.02
MW-302	10/8/20 - 1245	655.80	14.4	7.00	0.14	2100	34.5	18.7
MW-303	10/8/20 - 1415	650.37	17.0	8.28	0.13	1602	-0.4	30.2
MW-304	10/8/20 - 1110	652.95	13.6	7.88	0.18	1675	-113.0	11.1
MW-305	10/9/20 - 1135	659.81	14	7.44	0.13	1810	-13.0	12.9
MW-305A	10/5/20 - 1108	648.01	14.2	7.46	0.19	11.02	11.0	NM
MW-306	10/9/20 - 910	670.18	13.4	6.54	0.12	1294	41.4	14
MW-307	10/7/20 - 1605	646.18	13.2	6.97	0.08	16.37	-62.2	4.56
MW-308	10/7/20 - 1330	642.85	13.2	7.24	0.11	1575	-56.5	1.15
MW-309	10/7/20 - 1150	641.50	13.3	7.57	0.09	1371	-71.1	7.7
MW-310	10/12/20 - 1000	638.46	13.9	7.07	0.16	1709	146.5	0.02
MW-310A	10/5/20 - 930	640.20	13.1	7.48	0.48	3122	89.7	NM
MW-311	10/12/20 - 1100	638.73	14.4	6.93	7.12	1024	-53.0	NM
MW-311A	10/6/20 - 1625	641.09	12.7	8.33	0.44	3177	39.6	NM

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed  
 NM = Not Measured

Notes:

none

Created by: KAK      Date: 5/1/2017  
 Last revision by: RM      Date: 10/16/2020  
 Checked by: NDK      Date: 10/20/2020

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\22CB30DC\[OGS\_CCR\_Field\_2020\_October.xlsx]GW Field Parameters

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192835-1

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
10/21/2020 2:55:17 PM*

Sandie Fredrick, Project Manager II  
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### LINKS

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

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## Job ID: 310-192835-1

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### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-192835-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/9/2020 5:40 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3° C.

#### HPLC/IC

Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-301 (310-192835-1). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.



# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192835-1	MW-301	Water	10/08/20 09:25	10/09/20 17:40	
310-192835-2	Field Blank	Water	10/08/20 15:10	10/09/20 17:40	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Client Sample ID: MW-301

## Lab Sample ID: 310-192835-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	170		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	140		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	58		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	650	F1	100	80	ug/L	1		6020A	Total/NA
Cadmium	0.075	J	0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	94		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.41	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	23		10	2.5	ug/L	1		6020A	Total/NA
Selenium	7.7		5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	660		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.4	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	682.34				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	163.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	4.2				mg/L	1		Field Sampling	Total/NA
pH, Field	6.22				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1035				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	15.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.02				NTU	1		Field Sampling	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-192835-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH	5.8	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

**Client Sample ID: MW-301**

**Lab Sample ID: 310-192835-1**

Date Collected: 10/08/20 09:25

Matrix: Water

Date Received: 10/09/20 17:40

### Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>170</b>		5.0	2.0	mg/L			10/18/20 19:27	5
Fluoride	<0.23		0.50	0.23	mg/L			10/18/20 19:27	5
<b>Sulfate</b>	<b>140</b>		5.0	3.6	mg/L			10/18/20 19:27	5

### Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 08:37	10/15/20 13:42	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Barium</b>	<b>58</b>		2.0	0.28	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Boron</b>	<b>650</b>	<b>F1</b>	100	80	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Cadmium</b>	<b>0.075</b>	<b>J</b>	0.10	0.049	ug/L		10/14/20 08:37	10/16/20 16:16	1
<b>Calcium</b>	<b>94</b>		0.50	0.19	mg/L		10/14/20 08:37	10/15/20 13:42	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Cobalt</b>	<b>0.41</b>	<b>J</b>	0.50	0.091	ug/L		10/14/20 08:37	10/15/20 13:42	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Lithium</b>	<b>23</b>		10	2.5	ug/L		10/14/20 08:37	10/15/20 13:42	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:42	1
<b>Selenium</b>	<b>7.7</b>		5.0	1.0	ug/L		10/14/20 08:37	10/15/20 13:42	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 08:37	10/15/20 13:42	1

### General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>660</b>		30	26	mg/L			10/13/20 15:15	1
<b>pH</b>	<b>6.4</b>	<b>HF</b>	0.1	0.1	SU			10/10/20 12:00	1

### Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>682.34</b>				ft			10/08/20 09:25	1
<b>Oxidation Reduction Potential</b>	<b>163.6</b>				millivolts			10/08/20 09:25	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>4.2</b>				mg/L			10/08/20 09:25	1
<b>pH, Field</b>	<b>6.22</b>				SU			10/08/20 09:25	1
<b>Specific Conductance, Field</b>	<b>1035</b>				umhos/cm			10/08/20 09:25	1
<b>Temperature, Field</b>	<b>15.4</b>				Degrees C			10/08/20 09:25	1
<b>Turbidity, Field</b>	<b>0.02</b>				NTU			10/08/20 09:25	1



# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-192835-2**

Date Collected: 10/08/20 15:10

Matrix: Water

Date Received: 10/09/20 17:40

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			10/18/20 19:43	1
Fluoride	<0.046		0.10	0.046	mg/L			10/18/20 19:43	1
Sulfate	<0.71		1.0	0.71	mg/L			10/18/20 19:43	1

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 08:37	10/15/20 13:55	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 08:37	10/15/20 13:55	1
Barium	<0.28		2.0	0.28	ug/L		10/14/20 08:37	10/15/20 13:55	1
Boron	<80		100	80	ug/L		10/14/20 08:37	10/15/20 13:55	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 08:37	10/16/20 16:23	1
Calcium	<0.19		0.50	0.19	mg/L		10/14/20 08:37	10/15/20 13:55	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:55	1
Cobalt	<0.091		0.50	0.091	ug/L		10/14/20 08:37	10/15/20 13:55	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 08:37	10/15/20 13:55	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 08:37	10/15/20 13:55	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:55	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 08:37	10/15/20 13:55	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 08:37	10/15/20 13:55	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			10/13/20 15:15	1
pH	5.8	HF	0.1	0.1	SU			10/10/20 12:02	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-296281/3**  
**Matrix: Water**  
**Analysis Batch: 296281**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			10/18/20 17:54	1
Fluoride	<0.046		0.10	0.046	mg/L			10/18/20 17:54	1
Sulfate	<0.71		1.0	0.71	mg/L			10/18/20 17:54	1

**Lab Sample ID: LCS 310-296281/4**  
**Matrix: Water**  
**Analysis Batch: 296281**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.47		mg/L		95	90 - 110
Fluoride	2.00	1.96		mg/L		98	90 - 110
Sulfate	10.0	9.68		mg/L		97	90 - 110

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-295356/1-A**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 08:37	10/15/20 13:35	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 08:37	10/15/20 13:35	1
Barium	<0.28		2.0	0.28	ug/L		10/14/20 08:37	10/15/20 13:35	1
Boron	<80		100	80	ug/L		10/14/20 08:37	10/15/20 13:35	1
Calcium	<0.19		0.50	0.19	mg/L		10/14/20 08:37	10/15/20 13:35	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:35	1
Cobalt	<0.091		0.50	0.091	ug/L		10/14/20 08:37	10/15/20 13:35	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 08:37	10/15/20 13:35	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 08:37	10/15/20 13:35	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 08:37	10/15/20 13:35	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 08:37	10/15/20 13:35	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 08:37	10/15/20 13:35	1

**Lab Sample ID: MB 310-295356/1-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 08:37	10/16/20 16:11	1

**Lab Sample ID: LCS 310-295356/2-A**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	200	200		ug/L		100	80 - 120
Arsenic	200	201		ug/L		100	80 - 120
Barium	100	105		ug/L		105	80 - 120
Boron	200	186		ug/L		93	80 - 120
Calcium	2.00	1.80		mg/L		90	80 - 120

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: LCS 310-295356/2-A**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	100	96.2		ug/L		96	80 - 120
Cobalt	100	99.7		ug/L		100	80 - 120
Lead	200	210		ug/L		105	80 - 120
Lithium	200	187		ug/L		93	80 - 120
Molybdenum	200	200		ug/L		100	80 - 120
Selenium	400	402		ug/L		101	80 - 120

**Lab Sample ID: LCS 310-295356/2-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	100	107		ug/L		107	80 - 120

**Lab Sample ID: LCS 310-295356/2-A ^10**  
**Matrix: Water**  
**Analysis Batch: 295755**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	200	187		ug/L		93	80 - 120

**Lab Sample ID: 310-192835-1 MS**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	<0.51		200	225		ug/L		112	75 - 125
Arsenic	<0.88		200	231		ug/L		116	75 - 125
Barium	58		100	172		ug/L		114	75 - 125
Boron	650	F1	200	910	F1	ug/L		130	75 - 125
Calcium	94		2.00	99.0	4	mg/L		252	75 - 125
Chromium	<1.1		100	108		ug/L		108	75 - 125
Cobalt	0.41	J	100	110		ug/L		110	75 - 125
Lead	<0.11		200	215		ug/L		107	75 - 125
Lithium	23		200	214		ug/L		96	75 - 125
Molybdenum	<1.1		200	228		ug/L		114	75 - 125
Selenium	7.7		400	436		ug/L		107	75 - 125
Thallium	<0.26		200	198	E	ug/L		99	75 - 125

**Lab Sample ID: 310-192835-1 MS**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cadmium	0.075	J	100	108		ug/L		108	75 - 125

Eurofins TestAmerica, Cedar Falls



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 310-192835-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
Antimony	<0.51		200	222		ug/L		111	75 - 125	1	20
Arsenic	<0.88		200	226		ug/L		113	75 - 125	2	20
Barium	58		100	171		ug/L		114	75 - 125	0	20
Boron	650	F1	200	889		ug/L		120	75 - 125	2	20
Calcium	94		2.00	97.2	4	mg/L		163	75 - 125	2	20
Chromium	<1.1		100	106		ug/L		106	75 - 125	2	20
Cobalt	0.41	J	100	111		ug/L		111	75 - 125	1	20
Lead	<0.11		200	216		ug/L		108	75 - 125	1	20
Lithium	23		200	212		ug/L		95	75 - 125	1	20
Molybdenum	<1.1		200	221		ug/L		111	75 - 125	3	20
Selenium	7.7		400	433		ug/L		106	75 - 125	1	20
Thallium	<0.26		200	200	E	ug/L		100	75 - 125	1	20

**Lab Sample ID: 310-192835-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	Limit
	Result	Qualifier	Added	Result	Qualifier						
Cadmium	0.075	J	100	107		ug/L		107	75 - 125	1	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 310-295296/1**  
**Matrix: Water**  
**Analysis Batch: 295296**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Dissolved Solids	<26		30	26	mg/L			10/13/20 15:15	1

**Lab Sample ID: LCS 310-295296/2**  
**Matrix: Water**  
**Analysis Batch: 295296**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec.	Limits

**Lab Sample ID: 310-192835-1 DU**  
**Matrix: Water**  
**Analysis Batch: 295296**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**

Analyte	Sample	Sample	DU	DU	Unit	D	RPD	Limit
	Result	Qualifier	Result	Qualifier				
Total Dissolved Solids	660		664		mg/L		0.3	24

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-294928/1  
Matrix: Water  
Analysis Batch: 294928

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

- 1
- 2
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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## HPLC/IC

### Analysis Batch: 296281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	9056A	
310-192835-2	Field Blank	Total/NA	Water	9056A	
MB 310-296281/3	Method Blank	Total/NA	Water	9056A	
LCS 310-296281/4	Lab Control Sample	Total/NA	Water	9056A	

## Metals

### Prep Batch: 295356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	3010A	
310-192835-2	Field Blank	Total/NA	Water	3010A	
MB 310-295356/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 310-295356/2-A ^10	Lab Control Sample	Total/NA	Water	3010A	
310-192835-1 MS	MW-301	Total/NA	Water	3010A	
310-192835-1 MSD	MW-301	Total/NA	Water	3010A	

### Analysis Batch: 295753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	6020A	295356
310-192835-2	Field Blank	Total/NA	Water	6020A	295356
MB 310-295356/1-A	Method Blank	Total/NA	Water	6020A	295356
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	6020A	295356
310-192835-1 MS	MW-301	Total/NA	Water	6020A	295356
310-192835-1 MSD	MW-301	Total/NA	Water	6020A	295356

### Analysis Batch: 295755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	6020A	295356
310-192835-2	Field Blank	Total/NA	Water	6020A	295356
MB 310-295356/1-A	Method Blank	Total/NA	Water	6020A	295356
LCS 310-295356/2-A ^10	Lab Control Sample	Total/NA	Water	6020A	295356
310-192835-1 MS	MW-301	Total/NA	Water	6020A	295356
310-192835-1 MSD	MW-301	Total/NA	Water	6020A	295356

### Analysis Batch: 295910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	6020A	295356
310-192835-2	Field Blank	Total/NA	Water	6020A	295356
MB 310-295356/1-A	Method Blank	Total/NA	Water	6020A	295356
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	6020A	295356
310-192835-1 MS	MW-301	Total/NA	Water	6020A	295356
310-192835-1 MSD	MW-301	Total/NA	Water	6020A	295356

## General Chemistry

### Analysis Batch: 294928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	SM 4500 H+ B	
310-192835-2	Field Blank	Total/NA	Water	SM 4500 H+ B	
LCS 310-294928/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## General Chemistry

### Analysis Batch: 295296

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	SM 2540C	
310-192835-2	Field Blank	Total/NA	Water	SM 2540C	
MB 310-295296/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-295296/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-192835-1 DU	MW-301	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 296469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192835-1	MW-301	Total/NA	Water	Field Sampling	

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# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Client Sample ID: MW-301

**Lab Sample ID: 310-192835-1**

Date Collected: 10/08/20 09:25

Matrix: Water

Date Received: 10/09/20 17:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296281	10/18/20 19:27	ACJ	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295753	10/15/20 13:42	SAD	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295755	10/15/20 13:42	SAD	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 16:16	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295296	10/13/20 15:15	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	294928	10/10/20 12:00	LBB	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/08/20 09:25	SLD	TAL CF

## Client Sample ID: Field Blank

**Lab Sample ID: 310-192835-2**

Date Collected: 10/08/20 15:10

Matrix: Water

Date Received: 10/09/20 17:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	296281	10/18/20 19:43	ACJ	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295753	10/15/20 13:55	SAD	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295755	10/15/20 13:55	SAD	TAL CF
Total/NA	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 16:23	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295296	10/13/20 15:15	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	294928	10/10/20 12:02	LBB	TAL CF

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192835-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



Environment Testing  
TestAmerica



310-192835 Chain of Custody

### Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SCS</u>			
City/State:	CITY <u>Clive</u>	STATE <u>IA</u>	Project: <u>Ottumwa GS</u>
Receipt Information			
Date/Time Received:	DATE <u>10/9/20</u>	TIME <u>1740</u>	Received By: <u>BLM</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Receipt			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE	
Thermometer ID:	<u>N</u>	Correction Factor (°C): <u>+0.0</u>	
Uncorrected Temp (°C):	<u>3.3</u>	Corrected Temp (°C): <u>3.3</u>	
Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):	<u>3.3</u>		
Corrected Temp (°C):	<u>3.3</u>		
Exception Notes			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C



Chain of Custody Record

<b>Client Information</b> Client Contact: Tanten Buszka Phone: 764-943-0855 Company: SCS Engineers Address: 8450 Hickman Road, Suite 2021 City: Clive State, Zip: IA, 50325 Phone: 764-943-0855 Email: tbuszka@scsengineers.com Project Name: Ottumwa Generating Station 25220072 Site: 065		Lab PM: Fredrick, Sandie E-Mail: sandra.fredrick@eurofins.com Due Date Requested: TAT Requested (days): PO #: 25219072 WO #: Project #: 31011020 SSOW#:		Carrier Tracking Note: COC No: 310-54605-16342.1 Page: 3 Page # of 5 Job #	
<b>Sample Identification</b> MW-301 Field Blank		Sample Date: 10-8-20 Sample Time: 9:25 Sample Type (C=Comp, G=grab): G Matrix (W=water, S=solid, O=other, BT=biological, AA=air)		Field Filtered Sample (Yes or No): Perform MS/MSD (Yes or No): 903.0, 904.0 602A - Metals (14) 2540C, Calcd, 9056A_ORGFM_28D, SM4500_H+ 2320B - Alkalinity - Carb/Bicarb 6020A - Metals (2)	
Sample Date: 10-8-20 Sample Time: 15:10 Sample Type (C=Comp, G=grab): G Matrix (W=water, S=solid, O=other, BT=biological, AA=air)		Field Filtered Sample (Yes or No): Perform MS/MSD (Yes or No): 903.0, 904.0 602A - Metals (14) 2540C, Calcd, 9056A_ORGFM_28D, SM4500_H+ 2320B - Alkalinity - Carb/Bicarb 6020A - Metals (2)		Analysis Requested: Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2S2O3 S - HZSO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)	
Sample Date: 10-8-20 Sample Time: 9:25 Sample Type (C=Comp, G=grab): G Matrix (W=water, S=solid, O=other, BT=biological, AA=air)		Field Filtered Sample (Yes or No): Perform MS/MSD (Yes or No): 903.0, 904.0 602A - Metals (14) 2540C, Calcd, 9056A_ORGFM_28D, SM4500_H+ 2320B - Alkalinity - Carb/Bicarb 6020A - Metals (2)		Special Instructions/Note: - 1 Filtered metals bottle SEE ATTACHED Sampling points + parameters table for requested analyses	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input checked="" type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months	
Empty Kit Relinquished by: Relinquished by: Matthew Cahalan Date/Time: 10/9/20 11:15 Company: SCS		Relinquished by: Date/Time: Company:		Method of Shipment: Date/Time: Company:	
Relinquished by: Date/Time: Company:		Relinquished by: Date/Time: Company:		Relinquished by: Date/Time: Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	



Table 1. Sampling Points and Parameters - CCR Rule Sampling Program  
Groundwater Monitoring - Ottumwa Generating Station / SCS Engineers Project #23216072

Parameter	COC Set #1 (Background)		COC Set #2 (Ash Pond)										COC Set #3 (ZLDP)				TOTAL	
	MW-301	Field	MW-302	MW-303	MW-304	MW-305	MW-306	MW-307	MW-308	MW-309	MW-310	MW-311	MW-311A	MW-307	MW-308	MW-309		
Boron	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chloride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfate	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
TDS	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Antimony	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Arsenic	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Barium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Beryllium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Calcium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Chromium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Fluoride	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lead	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Lithium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Molybdenum	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Selenium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Thallium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Radium	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Bicarbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Carbonate (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Iron (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Magnesium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Manganese (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Potassium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sodium (total)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Cobalt (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
Iron (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
Lithium (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	3
Manganese (filtered)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	14
Total Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Ferrous Iron (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Sulfide (CHEMets)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Groundwater Elevation	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Well Depth	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
pH (field)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Specific Conductance	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Dissolved Oxygen	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
DRP	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Temperature	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Turbidity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Color	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15
Odor	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	15

Notes: All samples are unfiltered (total).

I:\25220072\_00\Data and Calculations\Field Work Requests\065\_CCR\_Rule\_Sampling\_2010-05\Sheet1



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192835-1

**Login Number: 192835**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072.00**  
**October 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	10/8/20 - 905	682.34	15.4	6.22	4.2	1035	163.6	0.02
MW-302	10/8/20 - 1245	655.80	14.4	7.00	0.14	2100	34.5	18.7
MW-303	10/8/20 - 1415	650.37	17.0	8.28	0.13	1602	-0.4	30.2
MW-304	10/8/20 - 1110	652.95	13.6	7.88	0.18	1675	-113.0	11.1
MW-305	10/9/20 - 1135	659.81	14	7.44	0.13	1810	-13.0	12.9
MW-305A	10/5/20 - 1108	648.01	14.2	7.46	0.19	11.02	11.0	NM
MW-306	10/9/20 - 910	670.18	13.4	6.54	0.12	1294	41.4	14
MW-307	10/7/20 - 1605	646.18	13.2	6.97	0.08	16.37	-62.2	4.56
MW-308	10/7/20 - 1330	642.85	13.2	7.24	0.11	1575	-56.5	1.15
MW-309	10/7/20 - 1150	641.50	13.3	7.57	0.09	1371	-71.1	7.7
MW-310	10/12/20 - 1000	638.46	13.9	7.07	0.16	1709	146.5	0.02
MW-310A	10/5/20 - 930	640.20	13.1	7.48	0.48	3122	89.7	NM
MW-311	10/12/20 - 1100	638.73	14.4	6.93	7.12	1024	-53.0	NM
MW-311A	10/6/20 - 1625	641.09	12.7	8.33	0.44	3177	39.6	NM

Abbreviations:

mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed  
 NM = Not Measured

Notes:

none

Created by: KAK      Date: 5/1/2017  
 Last revision by: RM      Date: 10/16/2020  
 Checked by: NDK      Date: 10/20/2020

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\22CB30DC\[OGS\_CCR\_Field\_2020\_October.xlsx]GW Field Parameters

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192846-1

Client Project/Site: Ottumwa Generating Station 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
10/21/2020 11:36:15 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandra.fredrick@eurofinset.com](mailto:sandra.fredrick@eurofinset.com)

### LINKS

Review your project  
results through  
**Total Access**

Have a Question?



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[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

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## Job ID: 310-192846-1

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### Laboratory: Eurofins TestAmerica, Cedar Falls

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#### Narrative

**Job Narrative**  
**310-192846-1**

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/9/2020 5:40 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.3° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192846-1	MW-301	Water	10/08/20 09:25	10/09/20 17:40	
310-192846-2	Field Blank	Water	10/08/20 15:10	10/09/20 17:40	

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# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Client Sample ID: MW-301

## Lab Sample ID: 310-192846-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	38000		500	100	ug/L	1		6020A	Total/NA
Manganese	14		10	4.0	ug/L	1		6020A	Total/NA
Potassium	1500		500	150	ug/L	1		6020A	Total/NA
Sodium	87000		1000	810	ug/L	1		6020A	Total/NA
Manganese	13		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	160		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	160		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: Field Blank

## Lab Sample ID: 310-192846-2

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

**Client Sample ID: MW-301**  
 Date Collected: 10/08/20 09:25  
 Date Received: 10/09/20 17:40

**Lab Sample ID: 310-192846-1**  
 Matrix: Water

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:19	1
<b>Magnesium</b>	<b>38000</b>		500	100	ug/L		10/14/20 09:12	10/16/20 21:19	1
<b>Manganese</b>	<b>14</b>		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:19	1
<b>Potassium</b>	<b>1500</b>		500	150	ug/L		10/14/20 09:12	10/16/20 21:19	1
<b>Sodium</b>	<b>87000</b>		1000	810	ug/L		10/14/20 09:12	10/16/20 21:19	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 08:37	10/15/20 14:11	1
<b>Manganese</b>	<b>13</b>		10	4.0	ug/L		10/14/20 08:37	10/16/20 16:28	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>160</b>		10	3.8	mg/L			10/19/20 11:25	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/19/20 11:25	1
<b>Total Alkalinity as CaCO3 to pH 4.5</b>	<b>160</b>		10	3.8	mg/L			10/19/20 11:25	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

**Client Sample ID: Field Blank**

**Lab Sample ID: 310-192846-2**

**Date Collected: 10/08/20 15:10**

**Matrix: Water**

**Date Received: 10/09/20 17:40**

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:29	1
Magnesium	<100		500	100	ug/L		10/14/20 09:12	10/16/20 21:29	1
Manganese	<4.0		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:29	1
Potassium	<150		500	150	ug/L		10/14/20 09:12	10/16/20 21:29	1
Sodium	<810		1000	810	ug/L		10/14/20 09:12	10/16/20 21:29	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 08:37	10/15/20 14:14	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1

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# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-295356/1-A**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 08:37	10/15/20 13:35	1

**Lab Sample ID: MB 310-295356/1-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Manganese	<4.0		10	4.0	ug/L		10/14/20 08:37	10/16/20 16:11	1

**Lab Sample ID: LCS 310-295356/2-A**  
**Matrix: Water**  
**Analysis Batch: 295753**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	200	191		ug/L		96	80 - 120

**Lab Sample ID: LCS 310-295356/2-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295356**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Manganese	100	95.8		ug/L		96	80 - 120

**Lab Sample ID: MB 310-295364/1-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:14	1
Magnesium	<100		500	100	ug/L		10/14/20 09:12	10/16/20 21:14	1
Manganese	<4.0		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:14	1
Potassium	<150		500	150	ug/L		10/14/20 09:12	10/16/20 21:14	1
Sodium	<810		1000	810	ug/L		10/14/20 09:12	10/16/20 21:14	1

**Lab Sample ID: LCS 310-295364/2-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Iron	200	214		ug/L		107	80 - 120
Magnesium	2000	2190		ug/L		110	80 - 120
Manganese	100	106		ug/L		106	80 - 120
Potassium	2000	2300		ug/L		115	80 - 120
Sodium	2000	2320		ug/L		116	80 - 120

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 310-192846-1 MS**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Iron	<50		200	231		ug/L		115	75 - 125
Magnesium	38000		2000	39900	4	ug/L		87	75 - 125
Manganese	14		100	123		ug/L		109	75 - 125
Potassium	1500		2000	3800		ug/L		117	75 - 125
Sodium	87000		2000	87900	4	ug/L		60	75 - 125

**Lab Sample ID: 310-192846-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: MW-301**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	RPD Limit
Iron	<50		200	231		ug/L		115	75 - 125	0	20
Magnesium	38000		2000	39500	4	ug/L		66	75 - 125	1	20
Manganese	14		100	123		ug/L		110	75 - 125	0	20
Potassium	1500		2000	3720		ug/L		113	75 - 125	2	20
Sodium	87000		2000	88400	4	ug/L		86	75 - 125	1	20

## Method: 2320B - Alkalinity (Low Level)

**Lab Sample ID: MB 310-296101/1**  
**Matrix: Water**  
**Analysis Batch: 296101**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 14:29	1

**Lab Sample ID: LCS 310-296101/2**  
**Matrix: Water**  
**Analysis Batch: 296101**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3	1000	952		mg/L		95	90 - 110

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-296079/1**  
**Matrix: Water**  
**Analysis Batch: 296079**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 11:25	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/19/20 11:25	1
Total Alkalinity as CaCO3 to pH 4.5	<1.9		5.0	1.9	mg/L			10/19/20 11:25	1

Eurofins TestAmerica, Cedar Falls

# QC Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Method: SM 2320B - Alkalinity (Continued)

Lab Sample ID: LCS 310-296079/2  
Matrix: Water  
Analysis Batch: 296079

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Alkalinity as CaCO3 to pH 4.5	1000	1030		mg/L		103	90 - 110

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Metals

### Prep Batch: 295356

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-1	MW-301	Dissolved	Water	3010A	
310-192846-2	Field Blank	Dissolved	Water	3010A	
MB 310-295356/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	3010A	

### Prep Batch: 295364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-1	MW-301	Total/NA	Water	3010A	
310-192846-2	Field Blank	Total/NA	Water	3010A	
MB 310-295364/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295364/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-192846-1 MS	MW-301	Total/NA	Water	3010A	
310-192846-1 MSD	MW-301	Total/NA	Water	3010A	

### Analysis Batch: 295753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-1	MW-301	Dissolved	Water	6020A	295356
310-192846-2	Field Blank	Dissolved	Water	6020A	295356
MB 310-295356/1-A	Method Blank	Total/NA	Water	6020A	295356
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	6020A	295356

### Analysis Batch: 295910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-1	MW-301	Dissolved	Water	6020A	295356
310-192846-1	MW-301	Total/NA	Water	6020A	295364
310-192846-2	Field Blank	Total/NA	Water	6020A	295364
MB 310-295356/1-A	Method Blank	Total/NA	Water	6020A	295356
MB 310-295364/1-A	Method Blank	Total/NA	Water	6020A	295364
LCS 310-295356/2-A	Lab Control Sample	Total/NA	Water	6020A	295356
LCS 310-295364/2-A	Lab Control Sample	Total/NA	Water	6020A	295364
310-192846-1 MS	MW-301	Total/NA	Water	6020A	295364
310-192846-1 MSD	MW-301	Total/NA	Water	6020A	295364

## General Chemistry

### Analysis Batch: 296079

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-1	MW-301	Total/NA	Water	SM 2320B	
MB 310-296079/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-296079/2	Lab Control Sample	Total/NA	Water	SM 2320B	

### Analysis Batch: 296101

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192846-2	Field Blank	Total/NA	Water	2320B	
MB 310-296101/1	Method Blank	Total/NA	Water	2320B	
LCS 310-296101/2	Lab Control Sample	Total/NA	Water	2320B	

Eurofins TestAmerica, Cedar Falls



# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

**Client Sample ID: MW-301**

**Date Collected: 10/08/20 09:25**

**Date Received: 10/09/20 17:40**

**Lab Sample ID: 310-192846-1**

**Matrix: Water**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Dissolved	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Dissolved	Analysis	6020A		1	295753	10/15/20 14:11	SAD	TAL CF
Dissolved	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Dissolved	Analysis	6020A		1	295910	10/16/20 16:28	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:19	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296079	10/19/20 11:25	WJF	TAL CF

**Client Sample ID: Field Blank**

**Date Collected: 10/08/20 15:10**

**Date Received: 10/09/20 17:40**

**Lab Sample ID: 310-192846-2**

**Matrix: Water**

<u>Prep Type</u>	<u>Batch Type</u>	<u>Batch Method</u>	<u>Run</u>	<u>Dilution Factor</u>	<u>Batch Number</u>	<u>Prepared or Analyzed</u>	<u>Analyst</u>	<u>Lab</u>
Dissolved	Prep	3010A			295356	10/14/20 08:37	HED	TAL CF
Dissolved	Analysis	6020A		1	295753	10/15/20 14:14	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:29	SAD	TAL CF
Total/NA	Analysis	2320B		1	296101	10/19/20 14:29	WJF	TAL CF

**Laboratory References:**

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

- 1
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- 14

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station 25220072

Job ID: 310-192846-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
2320B	Alkalinity (Low Level)	SM	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

#### Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





Environment Testing  
TestAmerica



310-192846 Chain of Custody

**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS</u>			
City/State:	CITY <u>Clive</u>	STATE <u>IA</u>	Project: <u>Ottumwa BS</u>
Receipt Information			
Date/Time Received:	DATE <u>10.9.20</u>	TIME <u>1740</u>	Received By: <u>BLM</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Receipt			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Cooler # _____ of _____	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<u>N</u>	Correction Factor (°C): <u>+0.0</u>	
<small>Temp Blank Temperature: If no temp blank or temp blank temperature above criteria, please go to Section 2. If test criteria are met, continue.</small>			
Uncorrected Temp (°C):	<u>3.3</u>	Corrected Temp (°C): <u>3.3</u>	
Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):	<u>3.3</u>		
Corrected Temp (°C):	<u>3.3</u>		
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C

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<b>Client Information</b> Client Contact: <u>Tantien Buszka</u> Phone: <u>764-993-0855</u>		Lab P/N: <u>Fredrick, Sandie</u> E-Mail: <u>sandra.fredrick@eurofinset.com</u>		COC No: <u>310-54605-16342.1</u> Page: <u>Page 1 of 3</u> Job #:	
Address: <u>8450 Hickman Road Suite 207 Z1</u> City: <u>Clive</u> State/Zip: <u>IA, 50325</u> Phone: <u>764-993-0855</u> Email: <u>tbuszka@scsengineers.com</u> Project Name: <u>Ottumwa Generating Station 25220072</u> Site: <u>065</u>		Due Date Requested: TAT Requested (days): PO #: <u>25219072</u> WD #: Project #: <u>31011020</u> SSOW#:		Carrier Tracking Note: Analysis Requested	
<b>Sample Identification</b> Sample: <u>Tantien Buszka</u> Sample Date: <u>10-8-20</u> Sample Time: <u>9:25</u> Sample Type (C=Comp, G=grab): <u>G</u> Matrix (Water, Sewage, Groundwater, BT-Tissue, Air): <u>Water</u> Preservation Code:		Field Filtered Sample (Yes or No): Perform MS/MSD (Yes or No): 903.0, 904.0 6020A - Metals (14) 2320B - Alkalinity - Carb/Bicarb 2540C, Calcd, 9056A, ORGFM, 28D, SM4500, H+ 6020A - Metals (2)		Total Number of Containers: Special Instructions/Note: <u>- 1 Filtered metals bottle</u> <u>See attached</u> <u>Sampling points + parameters table for requested analysis</u>	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify)					
Empty Kit Relinquished by:					
Relinquished by: <u>Matthew Cahalan</u> Date/Time: <u>10/14/20 11:5</u> Company: <u>SCS</u>		Received by: <u>[Signature]</u> Date/Time: <u>10-9-20 17:40</u> Company:		Method of Shipment:	
Relinquished by: Date/Time:		Received by: Date/Time:		Company:	
Relinquished by: Date/Time:		Received by: Date/Time:		Company:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:			





# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192846-1

**Login Number: 192846**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Bovy, Lorraine L**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192916-1

Client Project/Site: Ottumwa Generating Station - 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
11/30/2020 2:57:57 PM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandra.fredrick@eurofinset.com](mailto:sandra.fredrick@eurofinset.com)

### LINKS

Review your project  
results through  
**Total Access**

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[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*





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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Job ID: 310-192916-1

### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

#### Job Narrative 310-192916-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/13/2020 4:45 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.1° C, 0.7° C and 0.7° C.

#### RAD

Method 903.0: Radium-226 prep batch 160-486609: Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-311A (310-192916-1), MW-302 (310-192916-2), MW-303 (310-192916-3), MW-304 (310-192916-4), MW-310A (310-192916-5), MW-310 (310-192916-6), MW-305A (310-192916-7), MW-306 (310-192916-8), MW-305 (310-192916-9), MW-311 (310-192916-10), (LCS 160-486609/1-A), (LCSD 160-486609/2-A) and (MB 160-486609/23-A)

Method 904.0: 903 Prep Batch: 160-486611 Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-311A (310-192916-1), MW-302 (310-192916-2), MW-303 (310-192916-3), MW-304 (310-192916-4), MW-310A (310-192916-5), MW-310 (310-192916-6), MW-305A (310-192916-7), MW-306 (310-192916-8), MW-305 (310-192916-9) and MW-311 (310-192916-10)

Method PrecSep\_0: Radium 226 Prep Batch 160-486611: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-311A (310-192916-1), MW-302 (310-192916-2), MW-303 (310-192916-3), MW-304 (310-192916-4), MW-310A (310-192916-5), MW-310 (310-192916-6), MW-305A (310-192916-7), MW-306 (310-192916-8), MW-305 (310-192916-9) and MW-311 (310-192916-10). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep-21: Radium 226 Prep Batch 160-486609: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-311A (310-192916-1), MW-302 (310-192916-2), MW-303 (310-192916-3), MW-304 (310-192916-4), MW-310A (310-192916-5), MW-310 (310-192916-6), MW-305A (310-192916-7), MW-306 (310-192916-8), MW-305 (310-192916-9) and MW-311 (310-192916-10). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192916-1	MW-311A	Water	10/08/20 16:00	10/13/20 16:45	
310-192916-2	MW-302	Water	10/08/20 13:04	10/13/20 16:45	
310-192916-3	MW-303	Water	10/08/20 14:38	10/13/20 16:45	
310-192916-4	MW-304	Water	10/08/20 11:26	10/13/20 16:45	
310-192916-5	MW-310A	Water	10/12/20 09:16	10/13/20 16:45	
310-192916-6	MW-310	Water	10/12/20 10:15	10/13/20 16:45	
310-192916-7	MW-305A	Water	10/09/20 10:45	10/13/20 16:45	
310-192916-8	MW-306	Water	10/09/20 09:27	10/13/20 16:45	
310-192916-9	MW-305	Water	10/09/20 11:45	10/13/20 16:45	
310-192916-10	MW-311	Water	10/12/20 11:00	10/13/20 16:45	

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

<b>Client Sample ID: MW-311A</b>	<b>Lab Sample ID: 310-192916-1</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-302</b>	<b>Lab Sample ID: 310-192916-2</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-303</b>	<b>Lab Sample ID: 310-192916-3</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-304</b>	<b>Lab Sample ID: 310-192916-4</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-310A</b>	<b>Lab Sample ID: 310-192916-5</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-310</b>	<b>Lab Sample ID: 310-192916-6</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-305A</b>	<b>Lab Sample ID: 310-192916-7</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-306</b>	<b>Lab Sample ID: 310-192916-8</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-305</b>	<b>Lab Sample ID: 310-192916-9</b>
<input type="checkbox"/> No Detections.	
<b>Client Sample ID: MW-311</b>	<b>Lab Sample ID: 310-192916-10</b>
<input type="checkbox"/> No Detections.	

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-192916-1**

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	2.22		0.287	0.350	1.00	0.146	pCi/L	10/23/20 06:43	11/24/20 09:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					10/23/20 06:43	11/24/20 09:44	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.880		0.351	0.360	1.00	0.493	pCi/L	10/23/20 07:18	11/19/20 12:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					10/23/20 07:18	11/19/20 12:26	1
Y Carrier	69.2		40 - 110					10/23/20 07:18	11/19/20 12:26	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	3.10		0.453	0.502	5.00	0.493	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-302**

**Lab Sample ID: 310-192916-2**

Date Collected: 10/08/20 13:04

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.158		0.0963	0.0974	1.00	0.119	pCi/L	10/23/20 06:43	11/22/20 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.9		40 - 110					10/23/20 06:43	11/22/20 17:26	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.289	U	0.274	0.276	1.00	0.443	pCi/L	10/23/20 07:18	11/19/20 12:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.9		40 - 110					10/23/20 07:18	11/19/20 12:26	1
Y Carrier	75.1		40 - 110					10/23/20 07:18	11/19/20 12:26	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.447		0.290	0.293	5.00	0.443	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-303**  
 Date Collected: 10/08/20 14:38  
 Date Received: 10/13/20 16:45

**Lab Sample ID: 310-192916-3**  
 Matrix: Water

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.147	U	0.109	0.110	1.00	0.153	pCi/L	10/23/20 06:43	11/22/20 17:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.5		40 - 110					10/23/20 06:43	11/22/20 17:26	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.507		0.317	0.320	1.00	0.482	pCi/L	10/23/20 07:18	11/19/20 12:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.5		40 - 110					10/23/20 07:18	11/19/20 12:26	1
Y Carrier	72.9		40 - 110					10/23/20 07:18	11/19/20 12:26	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.654		0.335	0.338	5.00	0.482	pCi/L		11/30/20 14:28	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-192916-4**

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.21		0.249	0.271	1.00	0.166	pCi/L	10/23/20 06:43	11/22/20 17:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		40 - 110					10/23/20 06:43	11/22/20 17:27	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.20		0.383	0.399	1.00	0.510	pCi/L	10/23/20 07:18	11/19/20 12:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		40 - 110					10/23/20 07:18	11/19/20 12:27	1
Y Carrier	76.6		40 - 110					10/23/20 07:18	11/19/20 12:27	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	2.41		0.457	0.482	5.00	0.510	pCi/L		11/30/20 14:28	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-192916-5**

Date Collected: 10/12/20 09:16

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	3.90		0.407	0.537	1.00	0.147	pCi/L	10/23/20 06:43	11/22/20 17:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110					10/23/20 06:43	11/22/20 17:27	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.563		0.308	0.312	1.00	0.461	pCi/L	10/23/20 07:18	11/19/20 12:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110					10/23/20 07:18	11/19/20 12:27	1
Y Carrier	74.0		40 - 110					10/23/20 07:18	11/19/20 12:27	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	4.46		0.510	0.621	5.00	0.461	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-310**  
**Date Collected: 10/12/20 10:15**  
**Date Received: 10/13/20 16:45**

**Lab Sample ID: 310-192916-6**  
**Matrix: Water**

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0766	U	0.0927	0.0929	1.00	0.152	pCi/L	10/23/20 06:43	11/22/20 17:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.1		40 - 110					10/23/20 06:43	11/22/20 17:27	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.353	U	0.338	0.340	1.00	0.547	pCi/L	10/23/20 07:18	11/19/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.1		40 - 110					10/23/20 07:18	11/19/20 12:29	1
Y Carrier	70.7		40 - 110					10/23/20 07:18	11/19/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.429	U	0.350	0.352	5.00	0.547	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-192916-7**

Date Collected: 10/09/20 10:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.92		0.301	0.347	1.00	0.181	pCi/L	10/23/20 06:43	11/22/20 19:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.6		40 - 110					10/23/20 06:43	11/22/20 19:28	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.132	U	0.323	0.323	1.00	0.556	pCi/L	10/23/20 07:18	11/19/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.6		40 - 110					10/23/20 07:18	11/19/20 12:29	1
Y Carrier	65.8		40 - 110					10/23/20 07:18	11/19/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	2.05		0.442	0.474	5.00	0.556	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-306**

**Lab Sample ID: 310-192916-8**

Date Collected: 10/09/20 09:27

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.163	U	0.132	0.132	1.00	0.187	pCi/L	10/23/20 06:43	11/22/20 19:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	58.4		40 - 110					10/23/20 06:43	11/22/20 19:28	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.727	U	0.482	0.486	1.00	0.740	pCi/L	10/23/20 07:18	11/19/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	58.4		40 - 110					10/23/20 07:18	11/19/20 12:29	1
Y Carrier	68.8		40 - 110					10/23/20 07:18	11/19/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium 226 and 228</b>	<b>0.889</b>		0.500	0.504	5.00	0.740	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-305**

**Lab Sample ID: 310-192916-9**

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.217		0.107	0.109	1.00	0.120	pCi/L	10/23/20 06:43	11/22/20 19:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110					10/23/20 06:43	11/22/20 19:28	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.265	U	0.319	0.319	1.00	0.526	pCi/L	10/23/20 07:18	11/19/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.7		40 - 110					10/23/20 07:18	11/19/20 12:29	1
Y Carrier	65.0		40 - 110					10/23/20 07:18	11/19/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.483	U	0.336	0.337	5.00	0.526	pCi/L		11/30/20 14:28	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

**Client Sample ID: MW-311**

**Lab Sample ID: 310-192916-10**

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 903.0 - Radium-226 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.247		0.110	0.113	1.00	0.126	pCi/L	10/23/20 06:43	11/24/20 09:44	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.8		40 - 110					10/23/20 06:43	11/24/20 09:44	1

**Method: 904.0 - Radium-228 (GFPC)**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.491		0.316	0.320	1.00	0.487	pCi/L	10/23/20 07:18	11/19/20 12:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.8		40 - 110					10/23/20 07:18	11/19/20 12:29	1
Y Carrier	71.4		40 - 110					10/23/20 07:18	11/19/20 12:29	1

**Method: Ra226\_Ra228 Pos - Combined Radium-226 and Radium-228**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium 226 and 228	0.738		0.335	0.339	5.00	0.487	pCi/L		11/30/20 14:28	1



# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Qualifiers

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Method: 903.0 - Radium-226 (GFPC)

**Lab Sample ID: MB 160-486609/23-A**  
**Matrix: Water**  
**Analysis Batch: 489947**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 486609**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.03188	U	0.0745	0.0746	1.00	0.138	pCi/L	10/23/20 06:43	11/22/20 21:12	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110				10/23/20 06:43		11/22/20 21:12	1

**Lab Sample ID: LCS 160-486609/1-A**  
**Matrix: Water**  
**Analysis Batch: 489947**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 486609**

Analyte	LCS		Spike	LCS	Total	RL	MDC	Unit	%Rec	%Rec. Limits
	%Yield	LCS Qualifier	Added	Result	Uncert. (2σ+/-)					
Radium-226			11.3	9.893	1.10	1.00	0.171	pCi/L	87	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	95.9		40 - 110							

**Lab Sample ID: LCSD 160-486609/2-A**  
**Matrix: Water**  
**Analysis Batch: 489947**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 486609**

Analyte	LCSD		Spike	LCSD	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	Limit
	%Yield	LCSD Qualifier	Added	Result	Uncert. (2σ+/-)							
Radium-226			11.3	9.886	1.10	1.00	0.128	pCi/L	87	75 - 125	0	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits									
Ba Carrier	92.1		40 - 110									

## Method: 904.0 - Radium-228 (GFPC)

**Lab Sample ID: MB 160-486611/23-A**  
**Matrix: Water**  
**Analysis Batch: 489824**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 486611**

Analyte	MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	MB Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.08633	U	0.271	0.272	1.00	0.470	pCi/L	10/23/20 07:18	11/19/20 12:37	1
Carrier	MB %Yield	MB Qualifier	Limits				Prepared		Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110				10/23/20 07:18		11/19/20 12:37	1
Y Carrier	80.4		40 - 110				10/23/20 07:18		11/19/20 12:37	1

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Method: 904.0 - Radium-228 (GFPC) (Continued)

**Lab Sample ID: LCS 160-486611/1-A**  
**Matrix: Water**  
**Analysis Batch: 489742**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 486611**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits													
									75	125												
Radium-228	7.64	7.587		0.967	1.00	0.487	pCi/L	99	75	125												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Carrier</th> <th>LCS %Yield</th> <th>LCS Qualifier</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Ba Carrier</td> <td>95.9</td> <td></td> <td>40 - 110</td> </tr> <tr> <td>Y Carrier</td> <td>75.1</td> <td></td> <td>40 - 110</td> </tr> </tbody> </table>											Carrier	LCS %Yield	LCS Qualifier	Limits	Ba Carrier	95.9		40 - 110	Y Carrier	75.1		40 - 110
Carrier	LCS %Yield	LCS Qualifier	Limits																			
Ba Carrier	95.9		40 - 110																			
Y Carrier	75.1		40 - 110																			

**Lab Sample ID: LCSD 160-486611/2-A**  
**Matrix: Water**  
**Analysis Batch: 489742**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 486611**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		RER	Limit												
									75	125	0.76	1												
Radium-228	7.64	9.181		1.13	1.00	0.512	pCi/L	120	75	125	0.76	1												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Carrier</th> <th>LCSD %Yield</th> <th>LCSD Qualifier</th> <th>Limits</th> </tr> </thead> <tbody> <tr> <td>Ba Carrier</td> <td>92.1</td> <td></td> <td>40 - 110</td> </tr> <tr> <td>Y Carrier</td> <td>72.9</td> <td></td> <td>40 - 110</td> </tr> </tbody> </table>													Carrier	LCSD %Yield	LCSD Qualifier	Limits	Ba Carrier	92.1		40 - 110	Y Carrier	72.9		40 - 110
Carrier	LCSD %Yield	LCSD Qualifier	Limits																					
Ba Carrier	92.1		40 - 110																					
Y Carrier	72.9		40 - 110																					

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Rad

### Prep Batch: 486609

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192916-1	MW-311A	Total/NA	Water	PrecSep-21	
310-192916-2	MW-302	Total/NA	Water	PrecSep-21	
310-192916-3	MW-303	Total/NA	Water	PrecSep-21	
310-192916-4	MW-304	Total/NA	Water	PrecSep-21	
310-192916-5	MW-310A	Total/NA	Water	PrecSep-21	
310-192916-6	MW-310	Total/NA	Water	PrecSep-21	
310-192916-7	MW-305A	Total/NA	Water	PrecSep-21	
310-192916-8	MW-306	Total/NA	Water	PrecSep-21	
310-192916-9	MW-305	Total/NA	Water	PrecSep-21	
310-192916-10	MW-311	Total/NA	Water	PrecSep-21	
MB 160-486609/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-486609/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-486609/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 486611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192916-1	MW-311A	Total/NA	Water	PrecSep_0	
310-192916-2	MW-302	Total/NA	Water	PrecSep_0	
310-192916-3	MW-303	Total/NA	Water	PrecSep_0	
310-192916-4	MW-304	Total/NA	Water	PrecSep_0	
310-192916-5	MW-310A	Total/NA	Water	PrecSep_0	
310-192916-6	MW-310	Total/NA	Water	PrecSep_0	
310-192916-7	MW-305A	Total/NA	Water	PrecSep_0	
310-192916-8	MW-306	Total/NA	Water	PrecSep_0	
310-192916-9	MW-305	Total/NA	Water	PrecSep_0	
310-192916-10	MW-311	Total/NA	Water	PrecSep_0	
MB 160-486611/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-486611/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-486611/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Client Sample ID: MW-311A

Lab Sample ID: 310-192916-1

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	490119	11/24/20 09:44	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:26	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-302

Lab Sample ID: 310-192916-2

Date Collected: 10/08/20 13:04

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 17:26	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:26	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-303

Lab Sample ID: 310-192916-3

Date Collected: 10/08/20 14:38

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 17:26	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:26	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-304

Lab Sample ID: 310-192916-4

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 17:27	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:27	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

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# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Client Sample ID: MW-310A

Lab Sample ID: 310-192916-5

Date Collected: 10/12/20 09:16

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 17:27	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:27	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-310

Lab Sample ID: 310-192916-6

Date Collected: 10/12/20 10:15

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 17:27	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:29	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-305A

Lab Sample ID: 310-192916-7

Date Collected: 10/09/20 10:45

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 19:28	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:29	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-306

Lab Sample ID: 310-192916-8

Date Collected: 10/09/20 09:27

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 19:28	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:29	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Client Sample ID: MW-305

Lab Sample ID: 310-192916-9

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	489947	11/22/20 19:28	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:29	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

## Client Sample ID: MW-311

Lab Sample ID: 310-192916-10

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			486609	10/23/20 06:43	AVB	TAL SL
Total/NA	Analysis	903.0		1	490119	11/24/20 09:44	FLC	TAL SL
Total/NA	Prep	PrecSep_0			486611	10/23/20 07:18	AVB	TAL SL
Total/NA	Analysis	904.0		1	489742	11/19/20 12:29	SCB	TAL SL
Total/NA	Analysis	Ra226_Ra228 Pos		1	490571	11/30/20 14:28	GRW	TAL SL

### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Accreditation/Certification Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Laboratory: Eurofins TestAmerica, St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-22
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-21
California	State	2886	06-30-21
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-21
HI - RadChem Recognition	State	n/a	06-30-21
Illinois	NELAP	004553	11-30-20
Iowa	State	373	12-01-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-21
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-21
MI - RadChem Recognition	State	9005	06-30-21
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-21
New Jersey	NELAP	MO002	06-30-21
New York	NELAP	11616	04-01-21
North Dakota	State	R-207	06-30-21
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-21
Oregon	NELAP	4157	09-01-21
Pennsylvania	NELAP	68-00540	02-28-21
South Carolina	State	85002001	06-30-21
Texas	NELAP	T104704193-19-13	07-31-21
US Fish & Wildlife	US Federal Programs	058448	07-31-21
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542019-11	07-31-21
Virginia	NELAP	10310	06-14-21
Washington	State	C592	08-30-21
West Virginia DEP	State	381	10-31-21

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228 Pos	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### Protocol References:

EPA = US Environmental Protection Agency

None = None

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

#### Laboratory References:

TAL SL = Eurofins TestAmerica, St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566





### Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <b>SCS Engineers</b>			
City/State: <b>CITY</b> <b>ctive</b>	STATE <b>ct</b>	Project: <b>OGS</b>	
Receipt Information			
Date/Time Received: DATE <b>10-12-20</b>	TIME <b>1645</b>	Received By: <b>ER</b>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>1</u> of <u>3</u>
Cooler Custody Seals Present?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <b>0</b>		Correction Factor (°C): <b>+0.1</b>	
Temp Blank Temperature - If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <b>0.2</b>		Corrected Temp (°C): <b>0.7</b>	
Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
a) If yes: Is there evidence that the chilling process began?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			





**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <b>SCS Engineers</b>			
City/State:	CITY <b>Clive</b>	STATE <b>OH</b>	Project: <b>065</b>
Receipt Information			
Date/Time Received:	DATE <b>10-12-20</b>	TIME <b>1645</b>	Received By: <b>ER</b>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <b>2</b> of <b>3</b>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <b>0</b>		Correction Factor (°C): <b>+0.1</b>	
Temp Blank Temperature: If no temp blank or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <b>0.6</b>		Corrected Temp (°C): <b>0.7</b>	
Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



Environment Testing  
TestAmerica

Place COC scanning label  
here

**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <u>SCS Engineers</u>			
City/State: <u>CLIVE</u>	CITY	STATE: <u>IA</u>	Project: <u>065</u>
Receipt Information			
Date/Time Received: <u>10-13-20</u>	DATE	TIME: <u>1645</u>	Received By: <u>ER</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE		
Thermometer ID: <u>0</u>	Correction Factor (°C): <u>+0.1</u>		
* Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.0</u>	Corrected Temp (°C): <u>0.1</u>		
Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

# Chain of Custody Record

TestAmerica Des Moines SC  
214

430497



Environment Te  
TestAmerica

Address:

TAL-I

Regulatory Program:  DW  NPDES  RCRA  Other:

Client Contact		Project Manager: Meg Blodgett		Site Contact: Tanten Buszka		COC No.:	
Company Name: SCS Engineers		Tel/Email: 608 345 9221		Lab Contact: Sandie Friedrich		Date:	
Address: 8450 Hickman Road Suite 27		Analysis Turnaround Time		Carrier:		Sampler:	
City/State/Zip: Clive Iowa, 50325		<input type="checkbox"/> CALENDAR DAYS <input type="checkbox"/> WORKING DAYS		Perform MS / MSD ( Y / N )		For Lab Use Only:	
Phone: 764-943-0855		TAT if different from Below		Filtered Sample ( Y / N )		Walk-in Client:	
Fax:		2 weeks		Sample Specific Notes:		Lab Sampling:	
Project Name: O&S		1 week				Job / SDG No.:	
Site: Ottumwa Generating Station		2 days					
PO # 25220072		1 day					

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.
MW-311A	10-8-20	16:00	G	water	
MW-302	10-8-20	13:04	G	water	
MW-303	10-8-20	14:38	G	water	
MW-304	10-8-20	11:26	G	water	
MW-310A	10-12-20	9:16	G	water	
MW-310	10-12-20	10:15	G	water	
MW-305A	10-4-20	10:45	G	water	
MW-306	10-9-20	9:27	G	water	
MW-305	10-4-20	11:45	G	water	
<del>MW-310</del> MW-311	10-12-20	11:00	G	water	

Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazardous  Flammable  Skin Irritant  Unknown  Poison B

Special Instructions/QC Requirements & Comments:

Custody Seals Intact:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Cooler Temp. (°C):	Obs'd:	Corrd:	Therm ID No.:
Relinquished by:	Tanten Buszka	Received by:		Company:	
Relinquished by:		Received by:		Company:	
Relinquished by:		Received in Laboratory by:	<i>[Signature]</i>	Company:	
		Date/Time:	10-12-20	Date/Time:	
		Date/Time:		Date/Time:	
		Date/Time:		Date/Time:	10-13-20 1600



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192916-1

**Login Number: 192916**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Ramos, Eric F**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192916-1

**Login Number: 192916**

**List Number: 2**

**Creator: Korrinhizer, Micha L**

**List Source: Eurofins TestAmerica, St. Louis**

**List Creation: 10/15/20 08:10 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Tracer/Carrier Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192916-1

## Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
310-192916-1	MW-311A	94.4	
310-192916-2	MW-302	95.9	
310-192916-3	MW-303	86.5	
310-192916-4	MW-304	85.3	
310-192916-5	MW-310A	96.5	
310-192916-6	MW-310	87.1	
310-192916-7	MW-305A	88.6	
310-192916-8	MW-306	58.4	
310-192916-9	MW-305	97.7	
310-192916-10	MW-311	93.8	
LCS 160-486609/1-A	Lab Control Sample	95.9	
LCSD 160-486609/2-A	Lab Control Sample Dup	92.1	
MB 160-486609/23-A	Method Blank	96.5	

**Tracer/Carrier Legend**  
 Ba = Ba Carrier

## Method: 904.0 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
310-192916-1	MW-311A	94.4	69.2
310-192916-2	MW-302	95.9	75.1
310-192916-3	MW-303	86.5	72.9
310-192916-4	MW-304	85.3	76.6
310-192916-5	MW-310A	96.5	74.0
310-192916-6	MW-310	87.1	70.7
310-192916-7	MW-305A	88.6	65.8
310-192916-8	MW-306	58.4	68.8
310-192916-9	MW-305	97.7	65.0
310-192916-10	MW-311	93.8	71.4
LCS 160-486611/1-A	Lab Control Sample	95.9	75.1
LCSD 160-486611/2-A	Lab Control Sample Dup	92.1	72.9
MB 160-486611/23-A	Method Blank	96.5	80.4

**Tracer/Carrier Legend**  
 Ba = Ba Carrier  
 Y = Y Carrier

## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192921-1

Client Project/Site: Ottumwa Generating Station - 25220072

**For:**

SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



*Authorized for release by:  
10/23/2020 9:56:47 AM*

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandra.fredrick@eurofinset.com](mailto:sandra.fredrick@eurofinset.com)

### LINKS

Review your project  
results through  
**Total Access**

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[www.eurofinsus.com/Env](http://www.eurofinsus.com/Env)

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

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## Job ID: 310-192921-1

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### Laboratory: Eurofins TestAmerica, Cedar Falls

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#### Narrative

#### Job Narrative 310-192921-1

#### Comments

No additional comments.

#### Receipt

The samples were received on 10/13/2020 4:45 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.1° C, 0.7° C and 0.7° C.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192921-1	MW-311A	Water	10/08/20 16:00	10/13/20 16:45	
310-192921-2	MW-302	Water	10/08/20 13:09	10/13/20 16:45	
310-192921-3	MW-303	Water	10/08/20 14:38	10/13/20 16:45	
310-192921-4	MW-304	Water	10/08/20 11:26	10/13/20 16:45	
310-192921-5	MW-310A	Water	10/12/20 09:16	10/13/20 16:45	
310-192921-6	MW-310	Water	10/12/20 10:15	10/13/20 16:45	
310-192921-7	MW-305A	Water	10/09/20 10:45	10/13/20 16:45	
310-192921-8	MW-306	Water	10/09/20 09:27	10/13/20 16:45	
310-192921-9	MW-305	Water	10/09/20 11:45	10/13/20 16:45	
310-192921-10	MW-311	Water	10/12/20 11:00	10/13/20 16:45	

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# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Client Sample ID: MW-311A

## Lab Sample ID: 310-192921-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	25000		500	100	ug/L	1		6020A	Total/NA
Manganese	8.3	J	10	4.0	ug/L	1		6020A	Total/NA
Potassium	10000		500	150	ug/L	1		6020A	Total/NA
Sodium	700000		10000	8100	ug/L	10		6020A	Total/NA
Lithium	230		10	2.5	ug/L	1		6020A	Dissolved
Manganese	5.8	J	10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	400		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	400		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-302

## Lab Sample ID: 310-192921-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	100		100	50	ug/L	1		6020A	Total/NA
Magnesium	57000		500	100	ug/L	1		6020A	Total/NA
Manganese	140		10	4.0	ug/L	1		6020A	Total/NA
Potassium	1900		500	150	ug/L	1		6020A	Total/NA
Sodium	280000		1000	810	ug/L	1		6020A	Total/NA
Manganese	130		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	72		5.0	1.9	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	72		5.0	1.9	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-303

## Lab Sample ID: 310-192921-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	310		100	50	ug/L	1		6020A	Total/NA
Magnesium	31000		500	100	ug/L	1		6020A	Total/NA
Manganese	1600		10	4.0	ug/L	1		6020A	Total/NA
Potassium	1100		500	150	ug/L	1		6020A	Total/NA
Sodium	150000		1000	810	ug/L	1		6020A	Total/NA
Manganese	1600		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	470		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	470		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-304

## Lab Sample ID: 310-192921-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	4200		100	50	ug/L	1		6020A	Total/NA
Magnesium	40000		500	100	ug/L	1		6020A	Total/NA
Manganese	3800		10	4.0	ug/L	1		6020A	Total/NA
Potassium	7800		500	150	ug/L	1		6020A	Total/NA
Sodium	210000		1000	810	ug/L	1		6020A	Total/NA
Iron	4200		100	50	ug/L	1		6020A	Dissolved
Manganese	3800		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	380		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	380		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-192921-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	280		100	50	ug/L	1		6020A	Total/NA
Magnesium	45000		500	100	ug/L	1		6020A	Total/NA
Manganese	31		10	4.0	ug/L	1		6020A	Total/NA
Potassium	11000		500	150	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Client Sample ID: MW-310A (Continued)

## Lab Sample ID: 310-192921-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sodium	620000		10000	8100	ug/L	10		6020A	Total/NA
Lithium	230		10	2.5	ug/L	1		6020A	Dissolved
Manganese	29		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	260		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	260		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-192921-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Magnesium	76000		500	100	ug/L	1		6020A	Total/NA
Manganese	390		10	4.0	ug/L	1		6020A	Total/NA
Potassium	12000		500	150	ug/L	1		6020A	Total/NA
Sodium	100000		1000	810	ug/L	1		6020A	Total/NA
Lithium	44		10	2.5	ug/L	1		6020A	Dissolved
Manganese	350		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	410		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	410		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-305A

## Lab Sample ID: 310-192921-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	64	J	100	50	ug/L	1		6020A	Total/NA
Magnesium	31000		500	100	ug/L	1		6020A	Total/NA
Manganese	150		10	4.0	ug/L	1		6020A	Total/NA
Potassium	4200		500	150	ug/L	1		6020A	Total/NA
Sodium	64000		1000	810	ug/L	1		6020A	Total/NA
Manganese	160		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	340		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	340		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-306

## Lab Sample ID: 310-192921-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	340		100	50	ug/L	1		6020A	Total/NA
Magnesium	23000		500	100	ug/L	1		6020A	Total/NA
Manganese	16000		100	40	ug/L	10		6020A	Total/NA
Potassium	3800		500	150	ug/L	1		6020A	Total/NA
Sodium	170000		1000	810	ug/L	1		6020A	Total/NA
Cobalt	5.1		0.50	0.091	ug/L	1		6020A	Dissolved
Iron	100		100	50	ug/L	1		6020A	Dissolved
Manganese	15000		100	40	ug/L	10		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	160		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	160		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-305

## Lab Sample ID: 310-192921-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	200		100	50	ug/L	1		6020A	Total/NA
Magnesium	48000		500	100	ug/L	1		6020A	Total/NA
Manganese	3600		10	4.0	ug/L	1		6020A	Total/NA
Potassium	8300		500	150	ug/L	1		6020A	Total/NA
Sodium	210000		1000	810	ug/L	1		6020A	Total/NA
Cobalt	17		0.50	0.091	ug/L	1		6020A	Dissolved

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Client Sample ID: MW-305 (Continued)

Lab Sample ID: 310-192921-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	63	J	100	50	ug/L	1		6020A	Dissolved
Manganese	3600		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	300		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	300		10	3.8	mg/L	1		SM 2320B	Total/NA

## Client Sample ID: MW-311

Lab Sample ID: 310-192921-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Iron	630		100	50	ug/L	1		6020A	Total/NA
Magnesium	40000		500	100	ug/L	1		6020A	Total/NA
Manganese	180		10	4.0	ug/L	1		6020A	Total/NA
Potassium	810		500	150	ug/L	1		6020A	Total/NA
Sodium	5100		1000	810	ug/L	1		6020A	Total/NA
Manganese	75		10	4.0	ug/L	1		6020A	Dissolved
Bicarbonate Alkalinity as CaCO3	290		10	3.8	mg/L	1		SM 2320B	Total/NA
Total Alkalinity as CaCO3 to pH 4.5	290		10	3.8	mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-192921-1**

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:42	1
<b>Magnesium</b>	<b>25000</b>		500	100	ug/L		10/14/20 09:12	10/16/20 21:42	1
<b>Manganese</b>	<b>8.3</b>	<b>J</b>	10	4.0	ug/L		10/14/20 09:12	10/16/20 21:42	1
<b>Potassium</b>	<b>10000</b>		500	150	ug/L		10/14/20 09:12	10/16/20 21:42	1
<b>Sodium</b>	<b>700000</b>		10000	8100	ug/L		10/14/20 09:12	10/17/20 14:00	10

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:15	1
<b>Lithium</b>	<b>230</b>		10	2.5	ug/L		10/14/20 09:14	10/17/20 16:15	1
<b>Manganese</b>	<b>5.8</b>	<b>J</b>	10	4.0	ug/L		10/14/20 09:14	10/17/20 16:15	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>400</b>		10	3.8	mg/L			10/22/20 09:34	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 09:34	1
<b>Total Alkalinity as CaCO3 to pH 4.5</b>	<b>400</b>		10	3.8	mg/L			10/22/20 09:34	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-302**

**Lab Sample ID: 310-192921-2**

Date Collected: 10/08/20 13:09

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	100		100	50	ug/L		10/14/20 09:12	10/16/20 21:45	1
Magnesium	57000		500	100	ug/L		10/14/20 09:12	10/16/20 21:45	1
Manganese	140		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:45	1
Potassium	1900		500	150	ug/L		10/14/20 09:12	10/16/20 21:45	1
Sodium	280000		1000	810	ug/L		10/14/20 09:12	10/16/20 21:45	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:26	1
Manganese	130		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:26	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	72		5.0	1.9	mg/L			10/22/20 09:34	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/22/20 09:34	1
Total Alkalinity as CaCO3 to pH 4.5	72		5.0	1.9	mg/L			10/22/20 09:34	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-303**

**Lab Sample ID: 310-192921-3**

Date Collected: 10/08/20 14:38

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	310		100	50	ug/L		10/14/20 09:12	10/16/20 21:47	1
Magnesium	31000		500	100	ug/L		10/14/20 09:12	10/16/20 21:47	1
Manganese	1600		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:47	1
Potassium	1100		500	150	ug/L		10/14/20 09:12	10/16/20 21:47	1
Sodium	150000		1000	810	ug/L		10/14/20 09:12	10/16/20 21:47	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:29	1
Manganese	1600		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:29	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	470		10	3.8	mg/L			10/22/20 09:34	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 09:34	1
Total Alkalinity as CaCO3 to pH 4.5	470		10	3.8	mg/L			10/22/20 09:34	1





# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-192921-4**

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4200		100	50	ug/L		10/14/20 09:12	10/16/20 21:50	1
Magnesium	40000		500	100	ug/L		10/14/20 09:12	10/16/20 21:50	1
Manganese	3800		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:50	1
Potassium	7800		500	150	ug/L		10/14/20 09:12	10/16/20 21:50	1
Sodium	210000		1000	810	ug/L		10/14/20 09:12	10/16/20 21:50	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	4200		100	50	ug/L		10/14/20 09:14	10/17/20 16:31	1
Manganese	3800		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:31	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	380		10	3.8	mg/L			10/22/20 09:34	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 09:34	1
Total Alkalinity as CaCO3 to pH 4.5	380		10	3.8	mg/L			10/22/20 09:34	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-192921-5**

Date Collected: 10/12/20 09:16

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	280		100	50	ug/L		10/14/20 09:12	10/16/20 21:53	1
Magnesium	45000		500	100	ug/L		10/14/20 09:12	10/16/20 21:53	1
Manganese	31		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:53	1
Potassium	11000		500	150	ug/L		10/14/20 09:12	10/16/20 21:53	1
Sodium	620000		10000	8100	ug/L		10/14/20 09:12	10/17/20 14:03	10

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:34	1
Lithium	230		10	2.5	ug/L		10/14/20 09:14	10/17/20 16:34	1
Manganese	29		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:34	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	260		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	260		10	3.8	mg/L			10/22/20 11:32	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-310**  
 Date Collected: 10/12/20 10:15  
 Date Received: 10/13/20 16:45

**Lab Sample ID: 310-192921-6**  
 Matrix: Water

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:55	1
<b>Magnesium</b>	<b>76000</b>		500	100	ug/L		10/14/20 09:12	10/16/20 21:55	1
<b>Manganese</b>	<b>390</b>		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:55	1
<b>Potassium</b>	<b>12000</b>		500	150	ug/L		10/14/20 09:12	10/16/20 21:55	1
<b>Sodium</b>	<b>100000</b>		1000	810	ug/L		10/14/20 09:12	10/16/20 21:55	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:36	1
<b>Lithium</b>	<b>44</b>		10	2.5	ug/L		10/14/20 09:14	10/17/20 16:36	1
<b>Manganese</b>	<b>350</b>		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:36	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Bicarbonate Alkalinity as CaCO3</b>	<b>410</b>		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
<b>Total Alkalinity as CaCO3 to pH 4.5</b>	<b>410</b>		10	3.8	mg/L			10/22/20 11:32	1

- 1
- 2
- 3
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- 14

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-192921-7**

Date Collected: 10/09/20 10:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	64	J	100	50	ug/L		10/14/20 09:12	10/16/20 21:58	1
Magnesium	31000		500	100	ug/L		10/14/20 09:12	10/16/20 21:58	1
Manganese	150		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:58	1
Potassium	4200		500	150	ug/L		10/14/20 09:12	10/16/20 21:58	1
Sodium	64000		1000	810	ug/L		10/14/20 09:12	10/16/20 21:58	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 16:50	1
Manganese	160		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:50	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	340		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	340		10	3.8	mg/L			10/22/20 11:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-306**

**Lab Sample ID: 310-192921-8**

Date Collected: 10/09/20 09:27

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	340		100	50	ug/L		10/14/20 09:12	10/16/20 22:01	1
Magnesium	23000		500	100	ug/L		10/14/20 09:12	10/16/20 22:01	1
Manganese	16000		100	40	ug/L		10/14/20 09:12	10/17/20 14:16	10
Potassium	3800		500	150	ug/L		10/14/20 09:12	10/16/20 22:01	1
Sodium	170000		1000	810	ug/L		10/14/20 09:12	10/16/20 22:01	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	5.1		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 16:52	1
Iron	100		100	50	ug/L		10/14/20 09:14	10/17/20 16:52	1
Manganese	15000		100	40	ug/L		10/14/20 09:14	10/19/20 13:58	10

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	160		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	160		10	3.8	mg/L			10/22/20 11:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-305**

**Lab Sample ID: 310-192921-9**

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	200		100	50	ug/L		10/14/20 09:12	10/16/20 22:03	1
Magnesium	48000		500	100	ug/L		10/14/20 09:12	10/16/20 22:03	1
Manganese	3600		10	4.0	ug/L		10/14/20 09:12	10/16/20 22:03	1
Potassium	8300		500	150	ug/L		10/14/20 09:12	10/16/20 22:03	1
Sodium	210000		1000	810	ug/L		10/14/20 09:12	10/16/20 22:03	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	17		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 16:55	1
Iron	63	J	100	50	ug/L		10/14/20 09:14	10/17/20 16:55	1
Manganese	3600		10	4.0	ug/L		10/14/20 09:14	10/17/20 16:55	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	300		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	300		10	3.8	mg/L			10/22/20 11:32	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-311**

**Lab Sample ID: 310-192921-10**

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	630		100	50	ug/L		10/14/20 09:12	10/16/20 22:19	1
Magnesium	40000		500	100	ug/L		10/14/20 09:12	10/16/20 22:19	1
Manganese	180		10	4.0	ug/L		10/14/20 09:12	10/16/20 22:19	1
Potassium	810		500	150	ug/L		10/14/20 09:12	10/16/20 22:19	1
Sodium	5100		1000	810	ug/L		10/14/20 09:12	10/16/20 22:19	1

**Method: 6020A - Metals (ICP/MS) - Dissolved**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Iron	<50		100	50	ug/L		10/19/20 08:04	10/20/20 21:34	1
Manganese	75		10	4.0	ug/L		10/19/20 08:04	10/20/20 21:34	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bicarbonate Alkalinity as CaCO3	290		10	3.8	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<3.8		10	3.8	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	290		10	3.8	mg/L			10/22/20 11:32	1



# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Qualifiers

### Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
♠	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-295364/1-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	<100		500	100	ug/L		10/14/20 09:12	10/16/20 21:14	1
Potassium	<150		500	150	ug/L		10/14/20 09:12	10/16/20 21:14	1
Sodium	<810		1000	810	ug/L		10/14/20 09:12	10/16/20 21:14	1
Iron	<50		100	50	ug/L		10/14/20 09:12	10/16/20 21:14	1
Manganese	<4.0		10	4.0	ug/L		10/14/20 09:12	10/16/20 21:14	1

**Lab Sample ID: LCS 310-295364/2-A**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Magnesium	2000	2190		ug/L		110	80 - 120
Potassium	2000	2300		ug/L		115	80 - 120
Sodium	2000	2320		ug/L		116	80 - 120
Iron	200	214		ug/L		107	80 - 120
Manganese	100	106		ug/L		106	80 - 120

**Lab Sample ID: 310-192921-9 DU**  
**Matrix: Water**  
**Analysis Batch: 295910**

**Client Sample ID: MW-305**  
**Prep Type: Total/NA**  
**Prep Batch: 295364**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Magnesium	48000		51800		ug/L		8	20
Potassium	8300		8970		ug/L		7	20
Sodium	210000		231000		ug/L		8	20
Iron	200		279	F5	ug/L		31	20
Manganese	3600		3840		ug/L		7	20

**Lab Sample ID: MB 310-295366/1-A**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.091		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 15:57	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 09:14	10/17/20 15:57	1
Iron	<50		100	50	ug/L		10/14/20 09:14	10/17/20 15:57	1
Manganese	<4.0		10	4.0	ug/L		10/14/20 09:14	10/17/20 15:57	1

**Lab Sample ID: LCS 310-295366/2-A**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	100	95.7		ug/L		96	80 - 120
Lithium	200	178		ug/L		89	80 - 120
Iron	200	191		ug/L		95	80 - 120
Manganese	100	95.4		ug/L		95	80 - 120

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 310-192921-1 MS**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: MW-311A**  
**Prep Type: Dissolved**  
**Prep Batch: 295366**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier				Limits	Limits
Lithium	230		200	390		ug/L		78	75 - 125	
Iron	<50		200	234		ug/L		117	75 - 125	
Manganese	5.8	J	100	119		ug/L		113	75 - 125	

**Lab Sample ID: 310-192921-1 MS**  
**Matrix: Water**  
**Analysis Batch: 296230**

**Client Sample ID: MW-311A**  
**Prep Type: Dissolved**  
**Prep Batch: 295366**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier				Limits	Limits
Sodium	680000		2000	694000	4	ug/L		897	75 - 125	

**Lab Sample ID: 310-192921-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: MW-311A**  
**Prep Type: Dissolved**  
**Prep Batch: 295366**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.		RPD	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit	
Lithium	230		200	407		ug/L		87	75 - 125	4	20	
Iron	<50		200	248		ug/L		124	75 - 125	6	20	
Manganese	5.8	J	100	127		ug/L		122	75 - 125	7	20	

**Lab Sample ID: 310-192921-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 296230**

**Client Sample ID: MW-311A**  
**Prep Type: Dissolved**  
**Prep Batch: 295366**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.		RPD	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit	
Sodium	680000		2000	711000	4	ug/L		1751	75 - 125	2	20	

**Lab Sample ID: MB 310-295914/1-B**  
**Matrix: Water**  
**Analysis Batch: 296398**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**  
**Prep Batch: 296008**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil	Fac
	Result	Qualifier								
Iron	<50		100	50	ug/L		10/19/20 08:04	10/20/20 21:29		1
Manganese	<4.0		10	4.0	ug/L		10/19/20 08:04	10/20/20 21:29		1

**Lab Sample ID: LCS 310-295914/2-B**  
**Matrix: Water**  
**Analysis Batch: 296398**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**  
**Prep Batch: 296008**

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec.	
							Result	Qualifier
Iron	200	207		ug/L		103	80 - 120	
Manganese	100	90.4		ug/L		90	80 - 120	

**Lab Sample ID: 310-192921-10 MS**  
**Matrix: Water**  
**Analysis Batch: 296398**

**Client Sample ID: MW-311**  
**Prep Type: Dissolved**  
**Prep Batch: 296008**

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec.	
	Result	Qualifier	Added	Result	Qualifier				Limits	Limits
Iron	<50		200	210		ug/L		105	75 - 125	
Manganese	75		100	168		ug/L		92	75 - 125	

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: 310-192921-10 MSD**  
**Matrix: Water**  
**Analysis Batch: 296398**

**Client Sample ID: MW-311**  
**Prep Type: Dissolved**  
**Prep Batch: 296008**

Analyte	Sample	Sample	Spike	MSD	MSD	Unit	D	%Rec	%Rec.	RPD	
	Result	Qualifier	Added	Result	Qualifier				Limits	RPD	Limit
Iron	<50		200	213		ug/L		106	75 - 125	1	20
Manganese	75		100	167		ug/L		92	75 - 125	0	20

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 310-296583/1**  
**Matrix: Water**  
**Analysis Batch: 296583**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/22/20 09:34	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/22/20 09:34	1
Total Alkalinity as CaCO3 to pH 4.5	<1.9		5.0	1.9	mg/L			10/22/20 09:34	1

**Lab Sample ID: LCS 310-296583/2**  
**Matrix: Water**  
**Analysis Batch: 296583**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec.
		Result	Qualifier				Limits
Total Alkalinity as CaCO3 to pH 4.5	1000	1000		mg/L		100	90 - 110

**Lab Sample ID: MB 310-296611/1**  
**Matrix: Water**  
**Analysis Batch: 296611**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Bicarbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/22/20 11:32	1
Carbonate Alkalinity as CaCO3	<1.9		5.0	1.9	mg/L			10/22/20 11:32	1
Total Alkalinity as CaCO3 to pH 4.5	<1.9		5.0	1.9	mg/L			10/22/20 11:32	1

**Lab Sample ID: LCS 310-296611/2**  
**Matrix: Water**  
**Analysis Batch: 296611**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS	LCS	Unit	D	%Rec	%Rec.
		Result	Qualifier				Limits
Total Alkalinity as CaCO3 to pH 4.5	1000	1030		mg/L		103	90 - 110

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Metals

### Prep Batch: 295364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-1	MW-311A	Total/NA	Water	3010A	
310-192921-2	MW-302	Total/NA	Water	3010A	
310-192921-3	MW-303	Total/NA	Water	3010A	
310-192921-4	MW-304	Total/NA	Water	3010A	
310-192921-5	MW-310A	Total/NA	Water	3010A	
310-192921-6	MW-310	Total/NA	Water	3010A	
310-192921-7	MW-305A	Total/NA	Water	3010A	
310-192921-8	MW-306	Total/NA	Water	3010A	
310-192921-9	MW-305	Total/NA	Water	3010A	
310-192921-10	MW-311	Total/NA	Water	3010A	
MB 310-295364/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295364/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-192921-9 DU	MW-305	Total/NA	Water	3010A	

### Prep Batch: 295366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-1	MW-311A	Dissolved	Water	3010A	
310-192921-2	MW-302	Dissolved	Water	3010A	
310-192921-3	MW-303	Dissolved	Water	3010A	
310-192921-4	MW-304	Dissolved	Water	3010A	
310-192921-5	MW-310A	Dissolved	Water	3010A	
310-192921-6	MW-310	Dissolved	Water	3010A	
310-192921-7	MW-305A	Dissolved	Water	3010A	
310-192921-8	MW-306	Dissolved	Water	3010A	
310-192921-9	MW-305	Dissolved	Water	3010A	
MB 310-295366/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295366/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-192921-1 MS	MW-311A	Dissolved	Water	3010A	
310-192921-1 MSD	MW-311A	Dissolved	Water	3010A	

### Analysis Batch: 295910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-1	MW-311A	Total/NA	Water	6020A	295364
310-192921-2	MW-302	Total/NA	Water	6020A	295364
310-192921-3	MW-303	Total/NA	Water	6020A	295364
310-192921-4	MW-304	Total/NA	Water	6020A	295364
310-192921-5	MW-310A	Total/NA	Water	6020A	295364
310-192921-6	MW-310	Total/NA	Water	6020A	295364
310-192921-7	MW-305A	Total/NA	Water	6020A	295364
310-192921-8	MW-306	Total/NA	Water	6020A	295364
310-192921-9	MW-305	Total/NA	Water	6020A	295364
310-192921-10	MW-311	Total/NA	Water	6020A	295364
MB 310-295364/1-A	Method Blank	Total/NA	Water	6020A	295364
LCS 310-295364/2-A	Lab Control Sample	Total/NA	Water	6020A	295364
310-192921-9 DU	MW-305	Total/NA	Water	6020A	295364

### Filtration Batch: 295914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-10	MW-311	Dissolved	Water	Filtration	
MB 310-295914/1-B	Method Blank	Dissolved	Water	Filtration	
LCS 310-295914/2-B	Lab Control Sample	Dissolved	Water	Filtration	

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# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Metals (Continued)

### Filtration Batch: 295914 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-10 MS	MW-311	Dissolved	Water	Filtration	
310-192921-10 MSD	MW-311	Dissolved	Water	Filtration	

### Analysis Batch: 296006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-1	MW-311A	Dissolved	Water	6020A	295366
310-192921-1	MW-311A	Total/NA	Water	6020A	295364
310-192921-2	MW-302	Dissolved	Water	6020A	295366
310-192921-3	MW-303	Dissolved	Water	6020A	295366
310-192921-4	MW-304	Dissolved	Water	6020A	295366
310-192921-5	MW-310A	Dissolved	Water	6020A	295366
310-192921-5	MW-310A	Total/NA	Water	6020A	295364
310-192921-6	MW-310	Dissolved	Water	6020A	295366
310-192921-7	MW-305A	Dissolved	Water	6020A	295366
310-192921-8	MW-306	Dissolved	Water	6020A	295366
310-192921-8	MW-306	Total/NA	Water	6020A	295364
310-192921-9	MW-305	Dissolved	Water	6020A	295366
MB 310-295366/1-A	Method Blank	Total/NA	Water	6020A	295366
LCS 310-295366/2-A	Lab Control Sample	Total/NA	Water	6020A	295366
310-192921-1 MS	MW-311A	Dissolved	Water	6020A	295366
310-192921-1 MSD	MW-311A	Dissolved	Water	6020A	295366

### Prep Batch: 296008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-10	MW-311	Dissolved	Water	3010A	295914
MB 310-295914/1-B	Method Blank	Dissolved	Water	3010A	295914
LCS 310-295914/2-B	Lab Control Sample	Dissolved	Water	3010A	295914
310-192921-10 MS	MW-311	Dissolved	Water	3010A	295914
310-192921-10 MSD	MW-311	Dissolved	Water	3010A	295914

### Analysis Batch: 296230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-8	MW-306	Dissolved	Water	6020A	295366
310-192921-1 MS	MW-311A	Dissolved	Water	6020A	295366
310-192921-1 MSD	MW-311A	Dissolved	Water	6020A	295366

### Analysis Batch: 296398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-10	MW-311	Dissolved	Water	6020A	296008
MB 310-295914/1-B	Method Blank	Dissolved	Water	6020A	296008
LCS 310-295914/2-B	Lab Control Sample	Dissolved	Water	6020A	296008
310-192921-10 MS	MW-311	Dissolved	Water	6020A	296008
310-192921-10 MSD	MW-311	Dissolved	Water	6020A	296008

## General Chemistry

### Analysis Batch: 296583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-1	MW-311A	Total/NA	Water	SM 2320B	
310-192921-2	MW-302	Total/NA	Water	SM 2320B	
310-192921-3	MW-303	Total/NA	Water	SM 2320B	

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## General Chemistry (Continued)

### Analysis Batch: 296583 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-4	MW-304	Total/NA	Water	SM 2320B	
MB 310-296583/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-296583/2	Lab Control Sample	Total/NA	Water	SM 2320B	

### Analysis Batch: 296611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192921-5	MW-310A	Total/NA	Water	SM 2320B	
310-192921-6	MW-310	Total/NA	Water	SM 2320B	
310-192921-7	MW-305A	Total/NA	Water	SM 2320B	
310-192921-8	MW-306	Total/NA	Water	SM 2320B	
310-192921-9	MW-305	Total/NA	Water	SM 2320B	
310-192921-10	MW-311	Total/NA	Water	SM 2320B	
MB 310-296611/1	Method Blank	Total/NA	Water	SM 2320B	
LCS 310-296611/2	Lab Control Sample	Total/NA	Water	SM 2320B	

# Lab Chronicle

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Client Sample ID: MW-311A

## Lab Sample ID: 310-192921-1

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:15	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:42	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		10	296006	10/17/20 14:00	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296583	10/22/20 09:34	LBB	TAL CF

## Client Sample ID: MW-302

## Lab Sample ID: 310-192921-2

Date Collected: 10/08/20 13:09

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:26	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:45	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296583	10/22/20 09:34	LBB	TAL CF

## Client Sample ID: MW-303

## Lab Sample ID: 310-192921-3

Date Collected: 10/08/20 14:38

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:29	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:47	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296583	10/22/20 09:34	LBB	TAL CF

## Client Sample ID: MW-304

## Lab Sample ID: 310-192921-4

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:31	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:50	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296583	10/22/20 09:34	LBB	TAL CF

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-192921-5**

**Date Collected: 10/12/20 09:16**

**Matrix: Water**

**Date Received: 10/13/20 16:45**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:34	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:53	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		10	296006	10/17/20 14:03	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

**Client Sample ID: MW-310**

**Lab Sample ID: 310-192921-6**

**Date Collected: 10/12/20 10:15**

**Matrix: Water**

**Date Received: 10/13/20 16:45**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:36	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:55	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-192921-7**

**Date Collected: 10/09/20 10:45**

**Matrix: Water**

**Date Received: 10/13/20 16:45**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:50	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 21:58	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

**Client Sample ID: MW-306**

**Lab Sample ID: 310-192921-8**

**Date Collected: 10/09/20 09:27**

**Matrix: Water**

**Date Received: 10/13/20 16:45**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:52	SAD	TAL CF
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		10	296230	10/19/20 13:58	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 22:01	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		10	296006	10/17/20 14:16	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

Eurofins TestAmerica, Cedar Falls



# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Client Sample ID: MW-305

Lab Sample ID: 310-192921-9

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Dissolved	Analysis	6020A		1	296006	10/17/20 16:55	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 22:03	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

## Client Sample ID: MW-311

Lab Sample ID: 310-192921-10

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Dissolved	Filtration	Filtration			295914	10/17/20 15:03	HED	TAL CF
Dissolved	Prep	3010A			296008	10/19/20 08:04	HED	TAL CF
Dissolved	Analysis	6020A		1	296398	10/20/20 21:34	SAD	TAL CF
Total/NA	Prep	3010A			295364	10/14/20 09:12	HED	TAL CF
Total/NA	Analysis	6020A		1	295910	10/16/20 22:19	SAD	TAL CF
Total/NA	Analysis	SM 2320B		1	296611	10/22/20 11:32	LBB	TAL CF

### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
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- 12
- 13
- 14

# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192921-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2320B	Alkalinity	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
Filtration	Sample Filtration	None	TAL CF

#### Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401





**Cooler/Sample Receipt and Temperature Log Form**

<b>Client Information</b>				
Client: <u>S&amp;S Engineers</u>				
City/State:	<u>IL</u>	STATE: <u>IL</u>	Project: <u>065</u>	
<b>Receipt Information</b>				
Date/Time Received:	DATE: <u>10-12-20</u>	TIME: <u>1645</u>	Received By: <u>ER</u>	
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee				
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____				
<b>Sample(s) received in Cooler?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Cooler ID:</i>				
<b>Multiple Coolers?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Cooler # <u>1</u> of <u>3</u></i>				
<b>Cooler Custody Seals Present?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>If yes: Cooler custody seals intact?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No				
<b>Sample Custody Seals Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes: Sample custody seals intact?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No				
<b>Trip Blank Present?</b> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <i>If yes: Which VOA samples are in cooler? ↓</i>				
<b>Coolant Information</b>				
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE				
Thermometer ID: <u>0</u>		Correction Factor (°C): <u>+0.1</u>		
Uncorrected Temp (°C): <u>0.6</u>		Corrected Temp (°C): <u>0.7</u>		
<b>Container(s) used:</b>				
	<u>CONTAINER 1</u>		<u>CONTAINER 2</u>	
Uncorrected Temp (°C):				
Corrected Temp (°C):				
<b>Acceptance Criteria</b>				
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No				
a) <i>If yes: Is there evidence that the chilling process began?</i> <input type="checkbox"/> Yes <input type="checkbox"/> No				
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No				
NOTE: If yes, contact PM before proceeding. If no, proceed with login				
<b>Additional Comments</b>				

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>SES Engineers</u>			
City/State:	CITY <u>Chgo</u>	STATE <u>IL</u>	Project: <u>065</u>
Receipt Information			
Date/Time Received:	DATE <u>10-12-20</u>	TIME <u>1645</u>	Received By: <u>ER</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Container Information			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE	
Thermometer ID:	<u>0</u>	Correction Factor (°C):	<u>+0.1</u>
Sample Temperature			
Uncorrected Temp (°C):	<u>0.6</u>	Corrected Temp (°C):	<u>0.7</u>
Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exception Notes			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <b>SCS Engineers</b>			
City/State:	CITY <b>Clive</b>	STATE <b>OH</b>	Project: <b>OBS</b>
Receipt Information			
Date/Time Received:	DATE <b>10-17-20</b>	TIME <b>1645</b>	Received By: <b>ER</b>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID: _____	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <b>2</b> of <b>3</b>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____	<input type="checkbox"/> NONE	
Thermometer ID:	<b>0</b>	Correction Factor (°C):	<b>+0.1</b>
<i>Temp Blank Temperature - If no temp blank or temp blank temperature above criteria, proceed to Sample Container Temperature</i>			
Uncorrected Temp (°C):	<b>0.0</b>	Corrected Temp (°C):	<b>0.1</b>
Sample Container Temperature			
Container(s) used:	<u>CONTAINER 1</u>	<u>CONTAINER 2</u>	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			

1  
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TestAmerica Des Moines SC 214

Address:

Regulatory Program:  DW  NPDES  RCRA  Other: TAL-82

Client Contact  
 Company Name: SCS Engineers  
 Address: 8450 Hickman Road Suite 27  
 City/State/Zip: Clive Iowa, 50325  
 Phone: 264-943-0855  
 Fax:  
 Project Name: O&S  
 Site: Ottumwa Generating Station  
 PO # 1522007L

Project Manager: Meg Blodgett  
 Tel/Email: 608 345 9221  
 Analysis Turnaround Time  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below  
 2 weeks  
 1 week  
 2 days  
 1 day

Site Contact: Tanten Buszka  
 Lab Contact: Sandie Friedrich  
 Carrier:  
 Date:  
 COC No: 3 of 3 COCs

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Sample Specific Notes:
MW-311A	10-8-20	16:00	G	water		N	X	
MW-302	10-8-20	13:04	G	water		N	X	
MW-303	10-8-20	14:38	G	water		N	X	
MW-304	10-8-20	11:26	G	water		N	X	
MW-310A	10-12-20	9:16	G	water		N	X	
MW-310	10-12-20	10:15	G	water		N	X	
MW-305A	10-9-20	10:45	G	water		N	X	
MW-306	10-9-20	9:27	G	water		N	X	
MW-305	10-9-20	11:45	G	water		N	X	
<del>MW-310</del> MW-311	10-12-20	11:00	G	water		N	X	- Filtered metals bottle was not able to be Field Fil

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:  
 Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

Cooler Temp. (°C): Obs'd: \_\_\_\_\_ Cor'd: \_\_\_\_\_ Therm ID No.: \_\_\_\_\_

Relinquished by: Tanten Buszka  
 Date/Time: 10-12-20  
 Company: SCS

Relinquished by:  
 Date/Time:  
 Company:

Relinquished by:  
 Date/Time: 10-13-20 16:45  
 Company: BNA







# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192921-1

**Login Number: 192921**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	Sample 311 was not field filtered did not log dissolved
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls  
3019 Venture Way  
Cedar Falls, IA 50613  
Tel: (319)277-2401

Laboratory Job ID: 310-192934-1

Client Project/Site: Ottumwa Generating Station - 25220072  
Revision: 1

For:  
SCS Engineers  
2830 Dairy Drive  
Madison, Wisconsin 53718

Attn: Meghan Blodgett



Authorized for release by:  
1/20/2021 12:15:22 PM

Sandie Fredrick, Project Manager II  
(920)261-1660  
[sandra.fredrick@eurofinset.com](mailto:sandra.fredrick@eurofinset.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*



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# Case Narrative

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

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## Job ID: 310-192934-1

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### Laboratory: Eurofins TestAmerica, Cedar Falls

#### Narrative

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#### Job Narrative 310-192934-1

#### Comments

No additional comments.

#### Revision

The report being provided is a revision of the original report sent on 10/22/2020. The report (revision 1) is being revised due to: Client requested update to Field Data supplied for MW-305A..

#### Receipt

The samples were received on 10/13/2020 4:45 PM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.1° C, 0.7° C and 0.7° C.

#### HPLC/IC

Method 9056A: The following samples were diluted due to the nature of the sample matrix: MW-302 (310-192934-2), MW-303 (310-192934-3), MW-306 (310-192934-8), MW-311 (310-192934-9) and MW-305 (310-192934-10). Elevated reporting limits (RLs) are provided.

Method 9056A: The continuing calibration verification (CCV) associated with batch 310-296325 recovered above the upper control limit for Fluoride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: MW-302 (310-192934-2), MW-303 (310-192934-3), MW-306 (310-192934-8), MW-311 (310-192934-9) and MW-305 (310-192934-10).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

#### Metals

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

#### General Chemistry

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

# Sample Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-192934-1	MW-311A	Water	10/08/20 16:00	10/13/20 16:45	
310-192934-2	MW-302	Water	10/08/20 13:09	10/13/20 16:45	
310-192934-3	MW-303	Water	10/08/20 14:38	10/13/20 16:45	
310-192934-4	MW-304	Water	10/08/20 11:26	10/13/20 16:45	
310-192934-5	MW-310A	Water	10/12/20 09:16	10/13/20 16:45	
310-192934-6	MW-310	Water	10/12/20 10:15	10/13/20 16:45	
310-192934-7	MW-305A	Water	10/09/20 10:45	10/13/20 16:45	
310-192934-8	MW-306	Water	10/09/20 09:27	10/13/20 16:45	
310-192934-9	MW-311	Water	10/12/20 11:00	10/13/20 16:45	
310-192934-10	MW-305	Water	10/09/20 11:45	10/13/20 16:45	

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-311A

## Lab Sample ID: 310-192934-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	4.4		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1200		20	14	mg/L	20		9056A	Total/NA
Barium	15		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1600		100	80	ug/L	1		6020A	Total/NA
Calcium	51		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.12	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	240		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	3.1		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2400		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.9	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	641.09				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	39.6				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.44				mg/L	1		Field Sampling	Total/NA
pH, Field	8.33				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3177				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	12.7				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	NM				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-302

## Lab Sample ID: 310-192934-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	230		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	840		20	14	mg/L	20		9056A	Total/NA
Barium	18		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1300		100	80	ug/L	1		6020A	Total/NA
Cadmium	0.20		0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	1.5		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	9.6	J	10	2.5	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1700		150	130	mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	655.80				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	34.5				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.14				mg/L	1		Field Sampling	Total/NA
pH, Field	7.00				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	2100				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	18.7				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-303

## Lab Sample ID: 310-192934-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	210		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.26	J ^	0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	190		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	94		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1100		100	80	ug/L	1		6020A	Total/NA
Cadmium	0.46		0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	210		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	2.4		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	5.6	J	10	2.5	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-303 (Continued)

## Lab Sample ID: 310-192934-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids	1100		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.0	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	650.37				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-0.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.13				mg/L	1		Field Sampling	Total/NA
pH, Field	8.28				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1602				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	17.0				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	30.2				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-304

## Lab Sample ID: 310-192934-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	250		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.1		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	230		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	74		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1000		100	80	ug/L	1		6020A	Total/NA
Calcium	120		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.41	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	3.1	J	10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	1.5	J	2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1200		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	652.95				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-113.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.18				mg/L	1		Field Sampling	Total/NA
pH, Field	7.88				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1675				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.6				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	11.1				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310A

## Lab Sample ID: 310-192934-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	130		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	2.0		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	1100		20	14	mg/L	20		9056A	Total/NA
Barium	16		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1700		100	80	ug/L	1		6020A	Total/NA
Calcium	94		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.43	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	240		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	3.0		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	2200		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.7	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	640.20				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	89.7				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.48				mg/L	1		Field Sampling	Total/NA
pH, Field	7.48				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	3122				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.1				Degrees C	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-310A (Continued)

## Lab Sample ID: 310-192934-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Turbidity, Field	NM				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-310

## Lab Sample ID: 310-192934-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	150		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	1.0		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	570		20	14	mg/L	20		9056A	Total/NA
Antimony	0.61	J	1.0	0.51	ug/L	1		6020A	Total/NA
Arsenic	0.94	J	2.0	0.88	ug/L	1		6020A	Total/NA
Barium	55		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	800		100	80	ug/L	1		6020A	Total/NA
Cadmium	0.29		0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	180		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	0.38	J	0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	42		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	39		2.0	1.1	ug/L	1		6020A	Total/NA
Selenium	2.4	J	5.0	1.0	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1200		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	638.46				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	146.5				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.16				mg/L	1		Field Sampling	Total/NA
pH, Field	7.07				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1709				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.9				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	0.02				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305A

## Lab Sample ID: 310-192934-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	120		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.73		0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	130		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	75		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	180		100	80	ug/L	1		6020A	Total/NA
Calcium	150		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	1.5		0.50	0.091	ug/L	1		6020A	Total/NA
Lithium	13		10	2.5	ug/L	1		6020A	Total/NA
Molybdenum	6.4		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	660		30	26	mg/L	1		SM 2540C	Total/NA
pH	7.3	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	648.01				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	11.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.19				mg/L	1		Field Sampling	Total/NA
pH, Field	7.46				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1102				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14.2				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	NM				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls



# Detection Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-306

## Lab Sample ID: 310-192934-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	43		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	360		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	49		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	1100		100	80	ug/L	1		6020A	Total/NA
Cadmium	0.92		0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	80		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	5.9		0.50	0.091	ug/L	1		6020A	Total/NA
Molybdenum	5.6		2.0	1.1	ug/L	1		6020A	Total/NA
Total Dissolved Solids	900		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.8	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	670.18				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	41.4				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.12				mg/L	1		Field Sampling	Total/NA
pH, Field	6.54				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1294				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	13.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	14				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-311

## Lab Sample ID: 310-192934-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	14		5.0	2.0	mg/L	5		9056A	Total/NA
Sulfate	70		5.0	3.6	mg/L	5		9056A	Total/NA
Arsenic	1.7	J	2.0	0.88	ug/L	1		6020A	Total/NA
Barium	220		2.0	0.28	ug/L	1		6020A	Total/NA
Cadmium	0.12		0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	160		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	2.2		0.50	0.091	ug/L	1		6020A	Total/NA
Lead	1.8		0.50	0.11	ug/L	1		6020A	Total/NA
Lithium	4.6	J	10	2.5	ug/L	1		6020A	Total/NA
Total Dissolved Solids	640		30	26	mg/L	1		SM 2540C	Total/NA
pH	6.9	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	638.73				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-53.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	7.12				mg/L	1		Field Sampling	Total/NA
pH, Field	6.93				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1024				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14.4				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	NM				NTU	1		Field Sampling	Total/NA

## Client Sample ID: MW-305

## Lab Sample ID: 310-192934-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	290		5.0	2.0	mg/L	5		9056A	Total/NA
Fluoride	0.38	J ^	0.50	0.23	mg/L	5		9056A	Total/NA
Sulfate	93		5.0	3.6	mg/L	5		9056A	Total/NA
Barium	120		2.0	0.28	ug/L	1		6020A	Total/NA
Boron	900		100	80	ug/L	1		6020A	Total/NA
Cadmium	0.097	J	0.10	0.049	ug/L	1		6020A	Total/NA
Calcium	110		0.50	0.19	mg/L	1		6020A	Total/NA
Cobalt	17		0.50	0.091	ug/L	1		6020A	Total/NA
Molybdenum	7.9		2.0	1.1	ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Cedar Falls

# Detection Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-305 (Continued)**

**Lab Sample ID: 310-192934-10**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Thallium	0.35	J	1.0	0.26	ug/L	1		6020A	Total/NA
Total Dissolved Solids	1100		150	130	mg/L	1		SM 2540C	Total/NA
pH	7.2	HF	0.1	0.1	SU	1		SM 4500 H+ B	Total/NA
Ground Water Elevation	659.81				ft	1		Field Sampling	Total/NA
Oxidation Reduction Potential	-13.0				millivolts	1		Field Sampling	Total/NA
Oxygen, Dissolved, Client Supplied	0.13				mg/L	1		Field Sampling	Total/NA
pH, Field	7.44				SU	1		Field Sampling	Total/NA
Specific Conductance, Field	1810				umhos/cm	1		Field Sampling	Total/NA
Temperature, Field	14				Degrees C	1		Field Sampling	Total/NA
Turbidity, Field	12.9				NTU	1		Field Sampling	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-311A**

**Lab Sample ID: 310-192934-1**

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		5.0	2.0	mg/L			10/16/20 08:19	5
Fluoride	4.4		0.50	0.23	mg/L			10/16/20 08:19	5
Sulfate	1200		20	14	mg/L			10/16/20 09:06	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:00	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:00	1
Barium	15		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:00	1
Boron	1600		100	80	ug/L		10/14/20 09:14	10/17/20 17:00	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:00	1
Calcium	51		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:00	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:00	1
Cobalt	0.12	J	0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:00	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:00	1
Lithium	240		10	2.5	ug/L		10/14/20 09:14	10/17/20 17:00	1
Molybdenum	3.1		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:00	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:00	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:00	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2400		150	130	mg/L			10/14/20 16:23	1
pH	7.9	HF	0.1	0.1	SU			10/13/20 22:36	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	641.09				ft			10/08/20 16:00	1
Oxidation Reduction Potential	39.6				millivolts			10/08/20 16:00	1
Oxygen, Dissolved, Client Supplied	0.44				mg/L			10/08/20 16:00	1
pH, Field	8.33				SU			10/08/20 16:00	1
Specific Conductance, Field	3177				umhos/cm			10/08/20 16:00	1
Temperature, Field	12.7				Degrees C			10/08/20 16:00	1
Turbidity, Field	NM				NTU			10/08/20 16:00	1

# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-302**

**Lab Sample ID: 310-192934-2**

Date Collected: 10/08/20 13:09

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>230</b>		5.0	2.0	mg/L			10/15/20 21:49	5
Fluoride	<0.23	^	0.50	0.23	mg/L			10/15/20 21:49	5
<b>Sulfate</b>	<b>840</b>		20	14	mg/L			10/16/20 10:09	20

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:05	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Barium</b>	<b>18</b>		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Boron</b>	<b>1300</b>		100	80	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Cadmium</b>	<b>0.20</b>		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Calcium</b>	<b>180</b>		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:05	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Cobalt</b>	<b>1.5</b>		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:05	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:05	1
<b>Lithium</b>	<b>9.6</b>	J	10	2.5	ug/L		10/14/20 09:14	10/17/20 17:05	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:05	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:05	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:05	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>1700</b>		150	130	mg/L			10/14/20 16:23	1
<b>pH</b>	<b>6.8</b>	HF	0.1	0.1	SU			10/13/20 22:38	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>655.80</b>				ft			10/08/20 13:09	1
<b>Oxidation Reduction Potential</b>	<b>34.5</b>				millivolts			10/08/20 13:09	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>0.14</b>				mg/L			10/08/20 13:09	1
<b>pH, Field</b>	<b>7.00</b>				SU			10/08/20 13:09	1
<b>Specific Conductance, Field</b>	<b>2100</b>				umhos/cm			10/08/20 13:09	1
<b>Temperature, Field</b>	<b>14.4</b>				Degrees C			10/08/20 13:09	1
<b>Turbidity, Field</b>	<b>18.7</b>				NTU			10/08/20 13:09	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-303**

**Lab Sample ID: 310-192934-3**

Date Collected: 10/08/20 14:38

Matrix: Water

Date Received: 10/13/20 16:45

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	210		5.0	2.0	mg/L			10/15/20 22:04	5
Fluoride	0.26	J ^	0.50	0.23	mg/L			10/15/20 22:04	5
Sulfate	190		5.0	3.6	mg/L			10/15/20 22:04	5

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:08	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:08	1
Barium	94		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:08	1
Boron	1100		100	80	ug/L		10/14/20 09:14	10/17/20 17:08	1
Cadmium	0.46		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:08	1
Calcium	210		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:08	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:08	1
Cobalt	2.4		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:08	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:08	1
Lithium	5.6	J	10	2.5	ug/L		10/14/20 09:14	10/17/20 17:08	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:08	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:08	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:08	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		150	130	mg/L			10/14/20 16:23	1
pH	7.0	HF	0.1	0.1	SU			10/13/20 22:41	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	650.37				ft			10/08/20 14:38	1
Oxidation Reduction Potential	-0.4				millivolts			10/08/20 14:38	1
Oxygen, Dissolved, Client Supplied	0.13				mg/L			10/08/20 14:38	1
pH, Field	8.28				SU			10/08/20 14:38	1
Specific Conductance, Field	1602				umhos/cm			10/08/20 14:38	1
Temperature, Field	17.0				Degrees C			10/08/20 14:38	1
Turbidity, Field	30.2				NTU			10/08/20 14:38	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-304**

**Lab Sample ID: 310-192934-4**

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	250		5.0	2.0	mg/L			10/15/20 22:51	5
Fluoride	1.1		0.50	0.23	mg/L			10/16/20 10:24	5
Sulfate	230		5.0	3.6	mg/L			10/15/20 22:51	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:11	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:11	1
Barium	74		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:11	1
Boron	1000		100	80	ug/L		10/14/20 09:14	10/17/20 17:11	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:11	1
Calcium	120		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:11	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:11	1
Cobalt	0.41	J	0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:11	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:11	1
Lithium	3.1	J	10	2.5	ug/L		10/14/20 09:14	10/17/20 17:11	1
Molybdenum	1.5	J	2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:11	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:11	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:11	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1200		150	130	mg/L			10/14/20 16:23	1
pH	7.2	HF	0.1	0.1	SU			10/13/20 22:42	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	652.95				ft			10/08/20 11:26	1
Oxidation Reduction Potential	-113.0				millivolts			10/08/20 11:26	1
Oxygen, Dissolved, Client Supplied	0.18				mg/L			10/08/20 11:26	1
pH, Field	7.88				SU			10/08/20 11:26	1
Specific Conductance, Field	1675				umhos/cm			10/08/20 11:26	1
Temperature, Field	13.6				Degrees C			10/08/20 11:26	1
Turbidity, Field	11.1				NTU			10/08/20 11:26	1



# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-310A**

**Lab Sample ID: 310-192934-5**

Date Collected: 10/12/20 09:16

Matrix: Water

Date Received: 10/13/20 16:45

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	130		5.0	2.0	mg/L			10/15/20 23:07	5
Fluoride	2.0		0.50	0.23	mg/L			10/16/20 11:11	5
Sulfate	1100		20	14	mg/L			10/16/20 11:27	20

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:13	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:13	1
Barium	16		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:13	1
Boron	1700		100	80	ug/L		10/14/20 09:14	10/17/20 17:13	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:13	1
Calcium	94		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:13	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:13	1
Cobalt	0.43	J	0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:13	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:13	1
Lithium	240		10	2.5	ug/L		10/14/20 09:14	10/17/20 17:13	1
Molybdenum	3.0		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:13	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:13	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:13	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	2200		150	130	mg/L			10/15/20 17:38	1
pH	7.7	HF	0.1	0.1	SU			10/13/20 22:43	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	640.20				ft			10/12/20 09:16	1
Oxidation Reduction Potential	89.7				millivolts			10/12/20 09:16	1
Oxygen, Dissolved, Client Supplied	0.48				mg/L			10/12/20 09:16	1
pH, Field	7.48				SU			10/12/20 09:16	1
Specific Conductance, Field	3122				umhos/cm			10/12/20 09:16	1
Temperature, Field	13.1				Degrees C			10/12/20 09:16	1
Turbidity, Field	NM				NTU			10/12/20 09:16	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-310**

**Lab Sample ID: 310-192934-6**

Date Collected: 10/12/20 10:15

Matrix: Water

Date Received: 10/13/20 16:45

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	150		5.0	2.0	mg/L			10/15/20 23:22	5
Fluoride	1.0		0.50	0.23	mg/L			10/16/20 11:42	5
Sulfate	570		20	14	mg/L			10/16/20 11:58	20

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.61	J	1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:26	1
Arsenic	0.94	J	2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:26	1
Barium	55		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:26	1
Boron	800		100	80	ug/L		10/14/20 09:14	10/17/20 17:26	1
Cadmium	0.29		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:26	1
Calcium	180		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:26	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:26	1
Cobalt	0.38	J	0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:26	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:26	1
Lithium	42		10	2.5	ug/L		10/14/20 09:14	10/17/20 17:26	1
Molybdenum	39		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:26	1
Selenium	2.4	J	5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:26	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:26	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1200		150	130	mg/L			10/15/20 17:38	1
pH	7.3	HF	0.1	0.1	SU			10/13/20 22:44	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	638.46				ft			10/12/20 10:15	1
Oxidation Reduction Potential	146.5				millivolts			10/12/20 10:15	1
Oxygen, Dissolved, Client Supplied	0.16				mg/L			10/12/20 10:15	1
pH, Field	7.07				SU			10/12/20 10:15	1
Specific Conductance, Field	1709				umhos/cm			10/12/20 10:15	1
Temperature, Field	13.9				Degrees C			10/12/20 10:15	1
Turbidity, Field	0.02				NTU			10/12/20 10:15	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-305A**

**Lab Sample ID: 310-192934-7**

Date Collected: 10/09/20 10:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	120		5.0	2.0	mg/L			10/15/20 23:38	5
Fluoride	0.73		0.50	0.23	mg/L			10/16/20 12:13	5
Sulfate	130		5.0	3.6	mg/L			10/15/20 23:38	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:29	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:29	1
Barium	75		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:29	1
Boron	180		100	80	ug/L		10/14/20 09:14	10/17/20 17:29	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:29	1
Calcium	150		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:29	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:29	1
Cobalt	1.5		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:29	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:29	1
Lithium	13		10	2.5	ug/L		10/14/20 09:14	10/17/20 17:29	1
Molybdenum	6.4		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:29	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:29	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:29	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	660		30	26	mg/L			10/14/20 16:23	1
pH	7.3	HF	0.1	0.1	SU			10/13/20 22:46	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	648.01				ft			10/09/20 10:45	1
Oxidation Reduction Potential	11.0				millivolts			10/09/20 10:45	1
Oxygen, Dissolved, Client Supplied	0.19				mg/L			10/09/20 10:45	1
pH, Field	7.46				SU			10/09/20 10:45	1
Specific Conductance, Field	1102				umhos/cm			10/09/20 10:45	1
Temperature, Field	14.2				Degrees C			10/09/20 10:45	1
Turbidity, Field	NM				NTU			10/09/20 10:45	1



# Client Sample Results

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-306**

**Lab Sample ID: 310-192934-8**

Date Collected: 10/09/20 09:27

Matrix: Water

Date Received: 10/13/20 16:45

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>43</b>		5.0	2.0	mg/L			10/15/20 23:54	5
Fluoride	<0.23	^	0.50	0.23	mg/L			10/15/20 23:54	5
<b>Sulfate</b>	<b>360</b>		5.0	3.6	mg/L			10/15/20 23:54	5

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 17:32	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Barium</b>	<b>49</b>		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Boron</b>	<b>1100</b>		100	80	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Cadmium</b>	<b>0.92</b>		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Calcium</b>	<b>80</b>		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 17:32	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Cobalt</b>	<b>5.9</b>		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 17:32	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 17:32	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 09:14	10/17/20 17:32	1
<b>Molybdenum</b>	<b>5.6</b>		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 17:32	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 17:32	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 17:32	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>900</b>		30	26	mg/L			10/14/20 16:23	1
<b>pH</b>	<b>6.8</b>	HF	0.1	0.1	SU			10/13/20 22:47	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>670.18</b>				ft			10/09/20 09:27	1
<b>Oxidation Reduction Potential</b>	<b>41.4</b>				millivolts			10/09/20 09:27	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>0.12</b>				mg/L			10/09/20 09:27	1
<b>pH, Field</b>	<b>6.54</b>				SU			10/09/20 09:27	1
<b>Specific Conductance, Field</b>	<b>1294</b>				umhos/cm			10/09/20 09:27	1
<b>Temperature, Field</b>	<b>13.4</b>				Degrees C			10/09/20 09:27	1
<b>Turbidity, Field</b>	<b>14</b>				NTU			10/09/20 09:27	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-311**

**Lab Sample ID: 310-192934-9**

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

## Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Chloride</b>	<b>14</b>		5.0	2.0	mg/L			10/16/20 00:09	5
Fluoride	<0.23	^	0.50	0.23	mg/L			10/16/20 00:09	5
<b>Sulfate</b>	<b>70</b>		5.0	3.6	mg/L			10/16/20 00:09	5

## Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Arsenic</b>	<b>1.7</b>	<b>J</b>	2.0	0.88	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Barium</b>	<b>220</b>		2.0	0.28	ug/L		10/14/20 09:15	10/17/20 17:34	1
Boron	<80		100	80	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Cadmium</b>	<b>0.12</b>		0.10	0.049	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Calcium</b>	<b>160</b>		0.50	0.19	mg/L		10/14/20 09:15	10/17/20 17:34	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Cobalt</b>	<b>2.2</b>		0.50	0.091	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Lead</b>	<b>1.8</b>		0.50	0.11	ug/L		10/14/20 09:15	10/17/20 17:34	1
<b>Lithium</b>	<b>4.6</b>	<b>J</b>	10	2.5	ug/L		10/14/20 09:15	10/17/20 17:34	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 09:15	10/17/20 17:34	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:15	10/17/20 17:34	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:15	10/17/20 17:34	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Dissolved Solids</b>	<b>640</b>		30	26	mg/L			10/16/20 09:45	1
<b>pH</b>	<b>6.9</b>	<b>HF</b>	0.1	0.1	SU			10/13/20 22:52	1

## Method: Field Sampling - Field Sampling

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Ground Water Elevation</b>	<b>638.73</b>				ft			10/12/20 11:00	1
<b>Oxidation Reduction Potential</b>	<b>-53.0</b>				millivolts			10/12/20 11:00	1
<b>Oxygen, Dissolved, Client Supplied</b>	<b>7.12</b>				mg/L			10/12/20 11:00	1
<b>pH, Field</b>	<b>6.93</b>				SU			10/12/20 11:00	1
<b>Specific Conductance, Field</b>	<b>1024</b>				umhos/cm			10/12/20 11:00	1
<b>Temperature, Field</b>	<b>14.4</b>				Degrees C			10/12/20 11:00	1
<b>Turbidity, Field</b>	<b>NM</b>				NTU			10/12/20 11:00	1

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# Client Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

**Client Sample ID: MW-305**

**Lab Sample ID: 310-192934-10**

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

**Method: 9056A - Anions, Ion Chromatography**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	290		5.0	2.0	mg/L			10/16/20 00:25	5
Fluoride	0.38	J ^	0.50	0.23	mg/L			10/16/20 00:25	5
Sulfate	93		5.0	3.6	mg/L			10/16/20 00:25	5

**Method: 6020A - Metals (ICP/MS)**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:15	10/17/20 17:37	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:15	10/17/20 17:37	1
Barium	120		2.0	0.28	ug/L		10/14/20 09:15	10/17/20 17:37	1
Boron	900		100	80	ug/L		10/14/20 09:15	10/17/20 17:37	1
Cadmium	0.097	J	0.10	0.049	ug/L		10/14/20 09:15	10/17/20 17:37	1
Calcium	110		0.50	0.19	mg/L		10/14/20 09:15	10/17/20 17:37	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:15	10/17/20 17:37	1
Cobalt	17		0.50	0.091	ug/L		10/14/20 09:15	10/17/20 17:37	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:15	10/17/20 17:37	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 09:15	10/17/20 17:37	1
Molybdenum	7.9		2.0	1.1	ug/L		10/14/20 09:15	10/17/20 17:37	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:15	10/17/20 17:37	1
Thallium	0.35	J	1.0	0.26	ug/L		10/14/20 09:15	10/17/20 17:37	1

**General Chemistry**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	1100		150	130	mg/L			10/14/20 16:23	1
pH	7.2	HF	0.1	0.1	SU			10/13/20 22:49	1

**Method: Field Sampling - Field Sampling**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Ground Water Elevation	659.81				ft			10/09/20 11:45	1
Oxidation Reduction Potential	-13.0				millivolts			10/09/20 11:45	1
Oxygen, Dissolved, Client Supplied	0.13				mg/L			10/09/20 11:45	1
pH, Field	7.44				SU			10/09/20 11:45	1
Specific Conductance, Field	1810				umhos/cm			10/09/20 11:45	1
Temperature, Field	14				Degrees C			10/09/20 11:45	1
Turbidity, Field	12.9				NTU			10/09/20 11:45	1

# Definitions/Glossary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Qualifiers

### HPLC/IC

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

### General Chemistry

Qualifier	Qualifier Description
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 310-296325/3**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<0.40		1.0	0.40	mg/L			10/15/20 20:30	1
Fluoride	<0.046	^	0.10	0.046	mg/L			10/15/20 20:30	1
Sulfate	<0.71		1.0	0.71	mg/L			10/15/20 20:30	1

**Lab Sample ID: LCS 310-296325/35**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.00	1.89		mg/L		94	90 - 110

**Lab Sample ID: LCS 310-296325/4**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	10.0	9.78		mg/L		98	90 - 110
Sulfate	10.0	10.2		mg/L		102	90 - 110

**Lab Sample ID: 310-192934-1 MS**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	150		25.0	165	4	mg/L		72	80 - 120
Fluoride	4.4		5.00	9.51		mg/L		103	80 - 120

**Lab Sample ID: 310-192934-1 MS**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	1200		100	1270	4	mg/L		65	80 - 120

**Lab Sample ID: 310-192934-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	150		25.0	165	4	mg/L		71	80 - 120	0	15
Fluoride	4.4		5.00	9.57		mg/L		104	80 - 120	1	15

**Lab Sample ID: 310-192934-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 296325**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Sulfate	1200		100	1260	4	mg/L		51	80 - 120	1	15

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Method: 6020A - Metals (ICP/MS)

**Lab Sample ID: MB 310-295366/1-A**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.51		1.0	0.51	ug/L		10/14/20 09:14	10/17/20 15:57	1
Arsenic	<0.88		2.0	0.88	ug/L		10/14/20 09:14	10/17/20 15:57	1
Barium	<0.28		2.0	0.28	ug/L		10/14/20 09:14	10/17/20 15:57	1
Boron	<80		100	80	ug/L		10/14/20 09:14	10/17/20 15:57	1
Cadmium	<0.049		0.10	0.049	ug/L		10/14/20 09:14	10/17/20 15:57	1
Calcium	<0.19		0.50	0.19	mg/L		10/14/20 09:14	10/17/20 15:57	1
Chromium	<1.1		5.0	1.1	ug/L		10/14/20 09:14	10/17/20 15:57	1
Cobalt	<0.091		0.50	0.091	ug/L		10/14/20 09:14	10/17/20 15:57	1
Lead	<0.11		0.50	0.11	ug/L		10/14/20 09:14	10/17/20 15:57	1
Lithium	<2.5		10	2.5	ug/L		10/14/20 09:14	10/17/20 15:57	1
Molybdenum	<1.1		2.0	1.1	ug/L		10/14/20 09:14	10/17/20 15:57	1
Selenium	<1.0		5.0	1.0	ug/L		10/14/20 09:14	10/17/20 15:57	1
Thallium	<0.26		1.0	0.26	ug/L		10/14/20 09:14	10/17/20 15:57	1

**Lab Sample ID: LCS 310-295366/2-A**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	200	191		ug/L		95	80 - 120
Arsenic	200	194		ug/L		97	80 - 120
Barium	100	98.6		ug/L		99	80 - 120
Boron	200	198		ug/L		99	80 - 120
Cadmium	100	95.6		ug/L		96	80 - 120
Calcium	2.00	1.76		mg/L		88	80 - 120
Chromium	100	89.7		ug/L		90	80 - 120
Cobalt	100	95.7		ug/L		96	80 - 120
Lead	200	191		ug/L		95	80 - 120
Lithium	200	178		ug/L		89	80 - 120
Molybdenum	200	186		ug/L		93	80 - 120
Selenium	400	388		ug/L		97	80 - 120

**Lab Sample ID: LCS 310-295366/2-A ^10**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	200	206		ug/L		103	80 - 120

**Lab Sample ID: 310-192934-1 DU**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.51		<0.51		ug/L		NC	20
Arsenic	<0.88		<0.88		ug/L		NC	20
Barium	15		15.2		ug/L		1	20
Boron	1600		1690		ug/L		6	20
Cadmium	<0.049		<0.049		ug/L		NC	20

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# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Method: 6020A - Metals (ICP/MS) (Continued)

**Lab Sample ID: 310-192934-1 DU**  
**Matrix: Water**  
**Analysis Batch: 296006**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**  
**Prep Batch: 295366**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Calcium	51		53.7		mg/L		5	20
Chromium	<1.1		<1.1		ug/L		NC	20
Cobalt	0.12	J	0.121	J	ug/L		3	20
Lead	<0.11		<0.11		ug/L		NC	20
Lithium	240		240		ug/L		1	20
Molybdenum	3.1		3.29		ug/L		5	20
Selenium	<1.0		<1.0		ug/L		NC	20
Thallium	<0.26		<0.26		ug/L		NC	20

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 310-295451/1**  
**Matrix: Water**  
**Analysis Batch: 295451**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			10/14/20 16:23	1

**Lab Sample ID: LCS 310-295451/2**  
**Matrix: Water**  
**Analysis Batch: 295451**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	982		mg/L		98	90 - 110

**Lab Sample ID: 310-192934-1 DU**  
**Matrix: Water**  
**Analysis Batch: 295451**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	2400		2260		mg/L		6	24

**Lab Sample ID: 310-192934-8 DU**  
**Matrix: Water**  
**Analysis Batch: 295451**

**Client Sample ID: MW-306**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	900		874		mg/L		3	24

**Lab Sample ID: MB 310-295685/1**  
**Matrix: Water**  
**Analysis Batch: 295685**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			10/15/20 17:38	1

Eurofins TestAmerica, Cedar Falls



# QC Sample Results

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

**Lab Sample ID: LCS 310-295685/2**  
**Matrix: Water**  
**Analysis Batch: 295685**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	1000		mg/L		100	90 - 110

**Lab Sample ID: MB 310-295763/1**  
**Matrix: Water**  
**Analysis Batch: 295763**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<26		30	26	mg/L			10/16/20 09:45	1

**Lab Sample ID: LCS 310-295763/2**  
**Matrix: Water**  
**Analysis Batch: 295763**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids	1000	984		mg/L		98	90 - 110

## Method: SM 4500 H+ B - pH

**Lab Sample ID: LCS 310-295314/1**  
**Matrix: Water**  
**Analysis Batch: 295314**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH	7.00	7.0		SU		100	98 - 102

**Lab Sample ID: 310-192934-1 DU**  
**Matrix: Water**  
**Analysis Batch: 295314**

**Client Sample ID: MW-311A**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.9	HF	7.9		SU		0.3	20

**Lab Sample ID: 310-192934-9 DU**  
**Matrix: Water**  
**Analysis Batch: 295314**

**Client Sample ID: MW-311**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	6.9	HF	6.9		SU		0	20

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## HPLC/IC

### Analysis Batch: 296325

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	9056A	
310-192934-1	MW-311A	Total/NA	Water	9056A	
310-192934-2	MW-302	Total/NA	Water	9056A	
310-192934-2	MW-302	Total/NA	Water	9056A	
310-192934-3	MW-303	Total/NA	Water	9056A	
310-192934-4	MW-304	Total/NA	Water	9056A	
310-192934-4	MW-304	Total/NA	Water	9056A	
310-192934-5	MW-310A	Total/NA	Water	9056A	
310-192934-5	MW-310A	Total/NA	Water	9056A	
310-192934-5	MW-310A	Total/NA	Water	9056A	
310-192934-6	MW-310	Total/NA	Water	9056A	
310-192934-6	MW-310	Total/NA	Water	9056A	
310-192934-6	MW-310	Total/NA	Water	9056A	
310-192934-7	MW-305A	Total/NA	Water	9056A	
310-192934-7	MW-305A	Total/NA	Water	9056A	
310-192934-8	MW-306	Total/NA	Water	9056A	
310-192934-9	MW-311	Total/NA	Water	9056A	
310-192934-10	MW-305	Total/NA	Water	9056A	
MB 310-296325/3	Method Blank	Total/NA	Water	9056A	
LCS 310-296325/35	Lab Control Sample	Total/NA	Water	9056A	
LCS 310-296325/4	Lab Control Sample	Total/NA	Water	9056A	
310-192934-1 MS	MW-311A	Total/NA	Water	9056A	
310-192934-1 MS	MW-311A	Total/NA	Water	9056A	
310-192934-1 MSD	MW-311A	Total/NA	Water	9056A	
310-192934-1 MSD	MW-311A	Total/NA	Water	9056A	

## Metals

### Prep Batch: 295366

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	3010A	
310-192934-2	MW-302	Total/NA	Water	3010A	
310-192934-3	MW-303	Total/NA	Water	3010A	
310-192934-4	MW-304	Total/NA	Water	3010A	
310-192934-5	MW-310A	Total/NA	Water	3010A	
310-192934-6	MW-310	Total/NA	Water	3010A	
310-192934-7	MW-305A	Total/NA	Water	3010A	
310-192934-8	MW-306	Total/NA	Water	3010A	
310-192934-9	MW-311	Total/NA	Water	3010A	
310-192934-10	MW-305	Total/NA	Water	3010A	
MB 310-295366/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-295366/2-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 310-295366/2-A ^10	Lab Control Sample	Total/NA	Water	3010A	
310-192934-1 DU	MW-311A	Total/NA	Water	3010A	

### Analysis Batch: 296006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	6020A	295366
310-192934-2	MW-302	Total/NA	Water	6020A	295366
310-192934-3	MW-303	Total/NA	Water	6020A	295366
310-192934-4	MW-304	Total/NA	Water	6020A	295366

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
 Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Metals (Continued)

### Analysis Batch: 296006 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-5	MW-310A	Total/NA	Water	6020A	295366
310-192934-6	MW-310	Total/NA	Water	6020A	295366
310-192934-7	MW-305A	Total/NA	Water	6020A	295366
310-192934-8	MW-306	Total/NA	Water	6020A	295366
310-192934-9	MW-311	Total/NA	Water	6020A	295366
310-192934-10	MW-305	Total/NA	Water	6020A	295366
MB 310-295366/1-A	Method Blank	Total/NA	Water	6020A	295366
LCS 310-295366/2-A	Lab Control Sample	Total/NA	Water	6020A	295366
LCS 310-295366/2-A ^10	Lab Control Sample	Total/NA	Water	6020A	295366
310-192934-1 DU	MW-311A	Total/NA	Water	6020A	295366

## General Chemistry

### Analysis Batch: 295314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	SM 4500 H+ B	
310-192934-2	MW-302	Total/NA	Water	SM 4500 H+ B	
310-192934-3	MW-303	Total/NA	Water	SM 4500 H+ B	
310-192934-4	MW-304	Total/NA	Water	SM 4500 H+ B	
310-192934-5	MW-310A	Total/NA	Water	SM 4500 H+ B	
310-192934-6	MW-310	Total/NA	Water	SM 4500 H+ B	
310-192934-7	MW-305A	Total/NA	Water	SM 4500 H+ B	
310-192934-8	MW-306	Total/NA	Water	SM 4500 H+ B	
310-192934-9	MW-311	Total/NA	Water	SM 4500 H+ B	
310-192934-10	MW-305	Total/NA	Water	SM 4500 H+ B	
LCS 310-295314/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	
310-192934-1 DU	MW-311A	Total/NA	Water	SM 4500 H+ B	
310-192934-9 DU	MW-311	Total/NA	Water	SM 4500 H+ B	

### Analysis Batch: 295451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	SM 2540C	
310-192934-2	MW-302	Total/NA	Water	SM 2540C	
310-192934-3	MW-303	Total/NA	Water	SM 2540C	
310-192934-4	MW-304	Total/NA	Water	SM 2540C	
310-192934-7	MW-305A	Total/NA	Water	SM 2540C	
310-192934-8	MW-306	Total/NA	Water	SM 2540C	
310-192934-10	MW-305	Total/NA	Water	SM 2540C	
MB 310-295451/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-295451/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-192934-1 DU	MW-311A	Total/NA	Water	SM 2540C	
310-192934-8 DU	MW-306	Total/NA	Water	SM 2540C	

### Analysis Batch: 295685

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-5	MW-310A	Total/NA	Water	SM 2540C	
310-192934-6	MW-310	Total/NA	Water	SM 2540C	
MB 310-295685/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-295685/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Eurofins TestAmerica, Cedar Falls

# QC Association Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## General Chemistry

### Analysis Batch: 295763

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-9	MW-311	Total/NA	Water	SM 2540C	
MB 310-295763/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-295763/2	Lab Control Sample	Total/NA	Water	SM 2540C	

## Field Service / Mobile Lab

### Analysis Batch: 296469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-192934-1	MW-311A	Total/NA	Water	Field Sampling	
310-192934-2	MW-302	Total/NA	Water	Field Sampling	
310-192934-3	MW-303	Total/NA	Water	Field Sampling	
310-192934-4	MW-304	Total/NA	Water	Field Sampling	
310-192934-5	MW-310A	Total/NA	Water	Field Sampling	
310-192934-6	MW-310	Total/NA	Water	Field Sampling	
310-192934-7	MW-305A	Total/NA	Water	Field Sampling	
310-192934-8	MW-306	Total/NA	Water	Field Sampling	
310-192934-9	MW-311	Total/NA	Water	Field Sampling	
310-192934-10	MW-305	Total/NA	Water	Field Sampling	

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-311A

Lab Sample ID: 310-192934-1

Date Collected: 10/08/20 16:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/16/20 08:19	ACJ	TAL CF
Total/NA	Analysis	9056A		20	296325	10/16/20 09:06	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:00	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:36	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/08/20 16:00	SLD	TAL CF

## Client Sample ID: MW-302

Lab Sample ID: 310-192934-2

Date Collected: 10/08/20 13:09

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 21:49	ACJ	TAL CF
Total/NA	Analysis	9056A		20	296325	10/16/20 10:09	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:05	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:38	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/08/20 13:09	SLD	TAL CF

## Client Sample ID: MW-303

Lab Sample ID: 310-192934-3

Date Collected: 10/08/20 14:38

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 22:04	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:08	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:41	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/08/20 14:38	SLD	TAL CF

## Client Sample ID: MW-304

Lab Sample ID: 310-192934-4

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 22:51	ACJ	TAL CF
Total/NA	Analysis	9056A		5	296325	10/16/20 10:24	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:11	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF

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# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-304

Lab Sample ID: 310-192934-4

Date Collected: 10/08/20 11:26

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:42	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/08/20 11:26	SLD	TAL CF

## Client Sample ID: MW-310A

Lab Sample ID: 310-192934-5

Date Collected: 10/12/20 09:16

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 23:07	ACJ	TAL CF
Total/NA	Analysis	9056A		5	296325	10/16/20 11:11	ACJ	TAL CF
Total/NA	Analysis	9056A		20	296325	10/16/20 11:27	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:13	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295685	10/15/20 17:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:43	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/12/20 09:16	SLD	TAL CF

## Client Sample ID: MW-310

Lab Sample ID: 310-192934-6

Date Collected: 10/12/20 10:15

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 23:22	ACJ	TAL CF
Total/NA	Analysis	9056A		5	296325	10/16/20 11:42	ACJ	TAL CF
Total/NA	Analysis	9056A		20	296325	10/16/20 11:58	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:26	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295685	10/15/20 17:38	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:44	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/12/20 10:15	SLD	TAL CF

## Client Sample ID: MW-305A

Lab Sample ID: 310-192934-7

Date Collected: 10/09/20 10:45

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 23:38	ACJ	TAL CF
Total/NA	Analysis	9056A		5	296325	10/16/20 12:13	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:29	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:46	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/09/20 10:45	SLD	TAL CF

Eurofins TestAmerica, Cedar Falls

# Lab Chronicle

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Client Sample ID: MW-306

Lab Sample ID: 310-192934-8

Date Collected: 10/09/20 09:27

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/15/20 23:54	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:14	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:32	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:47	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/09/20 09:27	SLD	TAL CF

## Client Sample ID: MW-311

Lab Sample ID: 310-192934-9

Date Collected: 10/12/20 11:00

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/16/20 00:09	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:15	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:34	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295763	10/16/20 09:45	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:52	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/12/20 11:00	SLD	TAL CF

## Client Sample ID: MW-305

Lab Sample ID: 310-192934-10

Date Collected: 10/09/20 11:45

Matrix: Water

Date Received: 10/13/20 16:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	296325	10/16/20 00:25	ACJ	TAL CF
Total/NA	Prep	3010A			295366	10/14/20 09:15	HED	TAL CF
Total/NA	Analysis	6020A		1	296006	10/17/20 17:37	SAD	TAL CF
Total/NA	Analysis	SM 2540C		1	295451	10/14/20 16:23	SAS	TAL CF
Total/NA	Analysis	SM 4500 H+ B		1	295314	10/13/20 22:49	JMH	TAL CF
Total/NA	Analysis	Field Sampling		1	296469	10/09/20 11:45	SLD	TAL CF

### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

# Accreditation/Certification Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

## Laboratory: Eurofins TestAmerica, Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21

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# Method Summary

Client: SCS Engineers  
Project/Site: Ottumwa Generating Station - 25220072

Job ID: 310-192934-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
SM 4500 H+ B	pH	SM	TAL CF
Field Sampling	Field Sampling	EPA	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF

#### Protocol References:

EPA = US Environmental Protection Agency

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

TAL CF = Eurofins TestAmerica, Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401



**Cooler/Sample Receipt and Temperature Log Form**

Client: <b>SCS Engineers</b>			
City/State: <b>CIVE</b>	STATE: <b>IA</b>	Project: <b>065</b>	
Date/Time Received: DATE <b>10-17-20</b> TIME <b>1645</b>	Received By: <b>ER</b>		
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Sample(s) received in Cooler? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes: Cooler ID: _____	
Multiple Coolers? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes: Cooler # <u>1</u> of <u>3</u>	
Cooler Custody Seals Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <b>0</b>		Correction Factor (°C): <b>+0.1</b>	
Uncorrected Temp (°C): <b>0.6</b>		Corrected Temp (°C): <b>0.7</b>	
Container(s) used:		CONTAINER 1	CONTAINER 2
Uncorrected Temp (°C):			
Corrected Temp (°C):			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



Environment Testing  
TestAmerica

Place COC scanning label  
here

### Cooler/Sample Receipt and Temperature Log Form

<b>Client Information</b>			
Client: <u>SES Engineers</u>			
City/State:	CITY <u>Cine</u>	STATE <u>IA</u>	Project: <u>065</u>
<b>Receipt Information</b>			
Date/Time Received:	DATE <u>10-17-20</u>	TIME <u>1645</u>	Received By: <u>ER</u>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee			
<input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
<b>Condition of Cooler/Container</b>			
Sample(s) received in Cooler?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:
Multiple Coolers?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <u>2</u> of <u>3</u>
Cooler Custody Seals Present?		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Sample Custody Seals Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank Present?		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓
<b>Temperature Record</b>			
Coolant: <input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE			
Thermometer ID: <u>0</u>		Correction Factor (°C): <u>+0.1</u>	
Uncorrected Temp (°C): <u>0.6</u>		Corrected Temp (°C): <u>0.7</u>	
<b>Temperature by Container</b>			
Container(s) used:	CONTAINER 1		CONTAINER 2
Uncorrected Temp (°C):			
Corrected Temp (°C):			
<b>Condition Notes</b>			
1) If temperature exceeds criteria, was sample(s) received same day of sampling?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
a) If yes: Is there evidence that the chilling process began?		<input type="checkbox"/> Yes	<input type="checkbox"/> No
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?)		<input type="checkbox"/> Yes	<input type="checkbox"/> No
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
<b>Additional Comment:</b>			

Document: CF-LG-WI-002  
Revision: 25  
Date: 06/17/2019

Eurofins TestAmerica, Cedar Falls

General temperature criteria is 0 to 6°C  
Bacteria temperature criteria is 0 to 10°C



**Cooler/Sample Receipt and Temperature Log Form**

Client Information			
Client: <b>SCS Engineers</b>			
City/State:	CITY <b>Clive</b>	STATE <b>OH</b>	Project: <b>OBS</b>
Receipt Information			
Date/Time Received:	DATE <b>10-13-20</b>	TIME <b>1645</b>	Received By: <b>ER</b>
Delivery Type: <input type="checkbox"/> UPS <input type="checkbox"/> FedEx <input type="checkbox"/> FedEx Ground <input type="checkbox"/> US Mail <input type="checkbox"/> Spee-Dee <input checked="" type="checkbox"/> Lab Courier <input type="checkbox"/> Lab Field Services <input type="checkbox"/> Client Drop-off <input type="checkbox"/> Other: _____			
Condition of Cooler/Containers			
Sample(s) received in Cooler?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler ID:	
Multiple Coolers?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler # <b>3</b> of <b>3</b>	
Cooler Custody Seals Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	If yes: Cooler custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Sample Custody Seals Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Sample custody seals intact? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank Present?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If yes: Which VOA samples are in cooler? ↓	
Temperature Record			
Coolant:	<input checked="" type="checkbox"/> Wet ice <input type="checkbox"/> Blue ice <input type="checkbox"/> Dry ice <input type="checkbox"/> Other: _____ <input type="checkbox"/> NONE		
Thermometer ID:	<b>0</b>	Correction Factor (°C):	<b>+0.1</b>
Temp Blank Temperature - if no temp blank or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C):	<b>0.0</b>	Corrected Temp (°C):	<b>0.1</b>
Sample Container Temperature			
Container(s) used:	CONTAINER 1	CONTAINER 2	
Uncorrected Temp (°C):			
Corrected Temp (°C):			
Exceptions Noted			
1) If temperature exceeds criteria, was sample(s) received same day of sampling? <input type="checkbox"/> Yes <input type="checkbox"/> No			
a) If yes: Is there evidence that the chilling process began? <input type="checkbox"/> Yes <input type="checkbox"/> No			
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) <input type="checkbox"/> Yes <input type="checkbox"/> No			
NOTE: If yes, contact PM before proceeding. If no, proceed with login			
Additional Comments			



Address: \_\_\_\_\_ Regulatory Program:  DW  NPDES  RCRA  Other: \_\_\_\_\_ TAL-8210

**Client Contact**  
 Company Name: SCS Engineers  
 Address: 8450 Hickman Road Suite 27  
 City/State/Zip: Clive Iowa, 50325  
 Phone: 269-943-0855  
 Fax: \_\_\_\_\_  
 Project Name: 045  
 Site: Ottumwa Generating Station  
 P.O.# 25220072

**Project Manager:** Alex Blodgett  
 Tel/Email: 608-343-9221

**Site Contact:** Tanten Buszka  
 Lab Contact: Sandie Friedrich  
 Date: \_\_\_\_\_  
 Carrier: \_\_\_\_\_

**Analysis Turnaround Time**  
 CALENDAR DAYS  WORKING DAYS  
 TAT if different from Below  
 2 weeks  
 1 week  
 2 days  
 1 day

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	254C Calc TDS	9056A OR 6/AL 280	CI/Sulph/Fluoride SM4500	60204 Metals (14)	Sample Specific Notes:
MW-311A	10-8-20	16:00	G	water		N	N	X	X	X	X	
MW-302	10-8-20	15:09	G	water		N	N	X	X	X	X	
MW-303	10-8-20	14:38	G	water		N	N	X	X	X	X	
MW-304	10-8-20	11:26	G	water		N	N	X	X	X	X	
MW-310A	10-12-20	9:16	G	water		N	N	X	X	X	X	
MW-310	10-12-20	10:15	G	water		N	N	X	X	X	X	
MW-305A	10-9-20	10:45	G	water		N	N	X	X	X	X	
MW-306	10-9-20	9:27	G	water		N	N	X	X	X	X	
MW-311	10-12-20	11:20	G	water		N	N	X	X	X	X	

**Preservation Used:** 1= Ice, 2= HCl, 3= H2SO4, 4= HNO3, 5= NaOH, 6= Other

**Possible Hazard Identification:** Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown

Return to Client  Disposal by Lab  Archive for \_\_\_\_\_ Months

**Special Instructions/QC Requirements & Comments:**

Custody Seal No.: \_\_\_\_\_  
 Relinquished by: Tanten Buszka  
 Relinquished by: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_

Received by: \_\_\_\_\_  
 Date/Time: 10/12/20

Received by: \_\_\_\_\_  
 Date/Time: \_\_\_\_\_

Received in Laboratory by: \_\_\_\_\_  
 Date/Time: 10-13-2016

Therm ID No.: \_\_\_\_\_  
 Cooler Temp. (°C): Obs'd: \_\_\_\_\_  
 Company: \_\_\_\_\_





## Fredrick, Sandie

---

**From:** Kron, Nicole <NKron@scsengineers.com>  
**Sent:** Tuesday, January 19, 2021 4:49 PM  
**To:** Fredrick, Sandie  
**Cc:** Blodgett, Meghan  
**Subject:** OGS Ash Pond Lab Report revision needed  
**Attachments:** J192934-1 UDS Level 2 Report Final Report - Ash Pond CCR.pdf; J192575-1 UDS Level 2 Report Final Report - ZLDP CCR.pdf

EXTERNAL EMAIL\*

Hi Sandie,

Can you please revise the attached lab reports with the instructions below?

MW-305A (OGS ASH – 310-192934-1)  
Specific Conductance, Field – 11.02  $\mu\text{mhos/cm}$  **Please update to → 1102  $\mu\text{mhos/cm}$**

MW-307 (OGS ZLDP – 310-1925757-1)  
Specific Conductance, Field – 16.37  $\mu\text{mhos/cm}$  **Please update to → 1637  $\mu\text{mhos/cm}$**

Can you have the 310-192934-1 lab report revised by this Friday? The second lab report is less of a time crunch. If you can get that one updated by the end of January that would be very helpful.

Thank you,  
Nicole

**Nicole Kron**  
Hydrogeologist

**SCS ENGINEERS**  
2830 Dairy Drive  
Madison, WI 53718  
Cell: 608.354.5274  
[www.scsengineers.com](http://www.scsengineers.com)

\* WARNING - EXTERNAL: This email originated from outside of Eurofins TestAmerica. Do not click any links or open any attachments unless you trust the sender and know that the content is safe!

- 1
- 2
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- 10
- 11
- 12
- 13**
- 14
- 15



# Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-192934-1

SDG Number:

**Login Number: 192934**

**List Source: Eurofins TestAmerica, Cedar Falls**

**List Number: 1**

**Creator: Homolar, Dana J**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	False	extra sample received not on coc page 2 of 3 put at end
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Table 1. Groundwater Monitoring Results - Field Parameters**  
**Ottumwa Generating Station / SCS Engineers Project No. 25220072.00**  
**October 2020**

Sample	Date/Sample Time	Groundwater Elevation (amsl)	Temperature (Deg. C)	pH (Std. Units)	Dissolved Oxygen (mg/L)	Specific Conductivity (µmhos/cm)	ORP (mV)	Turbidity
MW-301	10/8/20 - 905	682.34	15.4	6.22	4.2	1035	163.6	0.02
MW-302	10/8/20 - 1245	655.80	14.4	7.00	0.14	2100	34.5	18.7
MW-303	10/8/20 - 1415	650.37	17.0	8.28	0.13	1602	-0.4	30.2
MW-304	10/8/20 - 1110	652.95	13.6	7.88	0.18	1675	-113.0	11.1
MW-305	10/9/20 - 1135	659.81	14	7.44	0.13	1810	-13.0	12.9
MW-305A	10/5/20 - 1108	648.01	14.2	7.46	0.19	11.02	11.0	NM
MW-306	10/9/20 - 910	670.18	13.4	6.54	0.12	1294	41.4	14
MW-307	10/7/20 - 1605	646.18	13.2	6.97	0.08	16.37	-62.2	4.56
MW-308	10/7/20 - 1330	642.85	13.2	7.24	0.11	1575	-56.5	1.15
MW-309	10/7/20 - 1150	641.50	13.3	7.57	0.09	1371	-71.1	7.7
MW-310	10/12/20 - 1000	638.46	13.9	7.07	0.16	1709	146.5	0.02
MW-310A	10/5/20 - 930	640.20	13.1	7.48	0.48	3122	89.7	NM
MW-311	10/12/20 - 1100	638.73	14.4	6.93	7.12	1024	-53.0	NM
MW-311A	10/6/20 - 1625	641.09	12.7	8.33	0.44	3177	39.6	NM

Abbreviations:


mg/L = milligrams per liter      amsl = above mean sea level      NA = Not Analyzed  
 NM = Not Measured

Notes:

none

Created by: KAK      Date: 5/1/2017  
 Last revision by: RM      Date: 10/16/2020  
 Checked by: NDK      Date: 10/20/2020

C:\Users\FredrickS\AppData\Local\Microsoft\Windows\INetCache\Content.Outlook\22CB30DC\[OGS\_CCR\_Field\_2020\_October.xlsx]GW Field Parameters



# Appendix D

## Historical Monitoring Results

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-301		Number of Sampling Dates: 20																			
Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/23/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	2/5/2020	3/12/2020	4/14/2020	10/8/2020
Boron	ug/L	574	612	597	620	599	565	657	779	488	480	735	--	410	--	380	680	540	--	700	650
Calcium	mg/L	66.9	62.5	65.6	71.9	74.1	61.5	59.3	66.8	65.2	63	72.5	--	47.2	--	43	78	68	--	84	94
Chloride	mg/L	63.4	66.9	73.3	76.3	71.6	54.8	69.8	73.5	59.8	63.4	--	63.1	33.9	--	50	110	120	--	140	170
Fluoride	mg/L	0.22	0.2	0.44	0.27	0.17	0.24	0.26	0.34	0.27	0.22	--	0.27	0.3	--	0.44	<0.23	--	--	<0.23	<0.23
Field pH	Std. Units	6.54	6.06	6.08	6.26	6.47	6.64	6.31	6.16	6.41	6.41	6.26	6.31	6.27	5.68	6.61	6.33	6.39	6.48	6.58	6.22
Sulfate	mg/L	150	157	159	169	171	190	166	162	178	186	--	181	164	--	81	130	130	--	140	140
Total Dissolved Solids	mg/L	500	531	576	545	545	499	490	557	448	514	--	532	392	--	340	510	570	--	550	660
Antimony	ug/L	<0.058	0.13	0.12	<0.058	0.11	<0.026	0.054	0.063	--	<0.026	0.2	--	<0.078	--	<0.53	<0.53	--	--	<0.58	<0.51
Arsenic	ug/L	0.38	0.38	0.26	0.14	0.23	0.22	0.15	0.14	--	0.074	0.29	--	0.16	--	<0.75	<0.75	<0.88	--	<0.88	<0.88
Barium	ug/L	51.6	55.8	52.3	53.3	42.4	35.5	39.9	44	--	31.6	44.5	--	28.1	--	25	56	43	--	54	58
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	0.14	--	<0.089	--	<0.27	<0.27	--	--	<0.27	--
Cadmium	ug/L	<0.029	<0.029	0.12	0.038	<0.029	0.035	0.044	0.037	--	0.023	0.16	--	<0.033	--	<0.077	0.04	<0.039	--	<0.039	0.075
Chromium	ug/L	0.59	0.74	0.64	<0.34	0.59	0.49	0.25	0.39	--	<0.054	0.25	--	0.11	--	<0.98	<0.98	<1.1	--	<1.1	<1.1
Cobalt	ug/L	4.1	3.1	1.8	1.8	1.3	0.97	1	0.96	--	0.46	1.4	--	0.36	--	0.44	0.6	1.1	0.43	0.52	0.41
Lead	ug/L	<0.19	<0.19	<0.19	<0.19	<0.19	0.06	0.1	0.049	--	0.041	0.18	--	<0.13	--	<0.27	<0.27	<0.27	--	<0.27	<0.11
Lithium	ug/L	22.8	28.7	27.6	25.5	20.1	21.8	24.9	27.9	--	19.1	26.5	--	19.4	--	15	24	17	21	24	23
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.083	--	--	<0.09	<0.1	<0.1	--	--	<0.1	--
Molybdenum	ug/L	1.2	1.2	0.89	1	0.76	0.54	0.79	1.3	--	0.67	1.3	--	0.72	--	<1.1	1.1	--	--	1.2	<1.1
Selenium	ug/L	4.7	5.4	6.1	6.5	5.9	4.2	5.5	7.2	--	4.3	6.3	--	3.4	--	3.1	6.2	--	--	6.8	7.7
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	<0.036	0.067	--	<0.036	0.16	--	<0.099	--	<0.27	<0.27	--	--	<0.26	<0.26
Total Radium	pCi/L	0.51	0.614	1.56	1.24	0.143	0.631	1.06	0.725	--	0.513	1.19	--	1.16	--	0.0956	0.956	0.228	--	0.315	0.407
Radium-226	pCi/L	0.084	0	0.831	-0.13	0.143	0.139	0.501	0.123	--	0.145	0.417	--	0.529	--	0.0726	0.15	0.049	--	0.0921	0.324
Radium-228	pCi/L	0.426	0.614	0.732	1.24	-0.403	0.492	0.562	0.602	--	0.368	0.773	--	0.627	--	0.023	0.753	0.179	--	0.223	0.0831
Field Specific Conductance	umhos/cm	572	777	807	853	834	742	758	1107	743	770	867	781	599	310	501	902	966	962	939	1035
Field Temperature	deg C	10.5	17.1	19.9	16.3	6.8	10.8	17.3	19.7	13.9	7.2	20.4	20.6	16.6	7.88	7.27	13.71	5.38	6.9	8.7	15.4
Groundwater Elevation	feet	682.8	682.58	682.27	682.04	681.67	682.15	681.91	681.28	681.54	681.53	680.91	681.09	682.5	682.22	682.69	683.07	683.3	682.82	683.25	682.34
Oxygen, Dissolved	mg/L	4.04	2.55	3.43	3.72	4.87	5.74	4.34	2.88	4.16	6.52	3.18	4.71	4.12	5.68	8.32	4.94	7.28	5.31	5.14	4.2
Turbidity	NTU	1.82	1.51	0.52	0.9	0.6	0.47	0.38	0.79	1.03	0.66	0.52	0.63	2.91	0.77	1.87	1.6	1.43	1.33	0.87	0.02
pH at 25 Degrees C	Std. Units	6.5	6.4	6.5	6.7	6.8	6.7	6.5	6.4	6.4	6.6	--	6.5	6.6	--	7.1	7.1	6.7	--	6.6	6.4
Field Oxidation Potential	millivolts	244.1	74.6	58.6	91.3	30.2	148	67.2	41.4	200.7	105.5	-55.5	--	119.7	118.3	37.6	9.9	68	258.5	176.3	163.6
Manganese	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	160
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	160
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	<50
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33000	38000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17	16	13
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1500	1500
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	77000	87000
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	0.44	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	<50
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	19	14
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22	--	--

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-302		Number of Sampling Dates: 18																	
Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/22/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	4/14/2020	10/8/2020
Boron	ug/L	1110	1130	1110	1180	1250	1200	1180	1250	1320	1200	1240	--	1100	--	1300	1200	1200	1300
Calcium	mg/L	193	177	171	184	188	184	175	179	183	177	185	--	146	--	200	180	180	180
Chloride	mg/L	258	258	276	270	259	281	253	264	254	246	--	259	214	--	240	220	220	230
Fluoride	mg/L	0.22	0.17	0.21	0.21	0.21	0.2	0.26	0.27	0.2	0.26	--	0.26	0.24	--	<0.23	<0.23	<0.23	<0.23
Field pH	Std. Units	6.82	6.46	8.72	6.45	6.62	6.78	6.67	6.75	6.55	6.47	6.76	6.77	6.37	6.58	6.61	6.55	6.7	7
Sulfate	mg/L	752	865	835	819	777	907	858	858	786	899	--	847	785	--	840	810	790	840
Total Dissolved Solids	mg/L	1680	1480	1770	1650	1660	1670	1670	1620	1620	1690	--	1840	1400	--	1600	1600	1500	1700
Antimony	ug/L	0.088	0.12	0.1	<0.058	0.11	<0.026	0.052	0.036	--	<0.026	<0.15	--	0.26	--	<0.53	<0.53	<0.58	<0.51
Arsenic	ug/L	1.7	0.69	0.17	<0.1	0.23	0.25	0.083	0.19	--	0.16	0.3	--	1.9	--	<0.75	<0.75	<0.88	<0.88
Barium	ug/L	31.5	23	20.7	21.2	20.4	19.4	18.2	18.5	--	17.7	18.3	--	28.9	--	19	21	23	18
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	--	0.22	--	<0.27	<0.27	<0.27	--
Cadmium	ug/L	0.25	0.21	0.28	0.24	0.15	0.2	0.19	0.21	--	0.22	0.21	--	0.67	--	0.21	0.2	0.23	0.2
Chromium	ug/L	2.1	0.82	0.64	0.64	0.58	1	0.58	0.7	--	0.46	0.48	--	1.6	--	<0.98	<0.98	1.4	<1.1
Cobalt	ug/L	2.6	1.4	1.1	1	0.94	0.95	0.86	0.88	--	0.9	1.5	--	4	--	1.2	2.7	5.3	1.5
Lead	ug/L	1.1	0.2	<0.19	<0.19	<0.19	0.2	0.081	<0.033	--	0.098	0.12	--	3.9	--	<0.27	0.29	1	<0.11
Lithium	ug/L	11.3	14.1	12.2	11.9	9.7	10.1	9.7	13.8	--	7.5	6.9	--	8.6	--	10	10	11	9.6
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	0.096	<0.083	--	--	<0.09	<0.1	<0.1	<0.1	--
Molybdenum	ug/L	0.68	0.6	0.46	0.46	0.5	0.44	0.38	0.51	--	0.59	0.54	--	<0.57	--	<1.1	<1.1	<1.1	<1.1
Selenium	ug/L	0.23	<0.18	<0.18	<0.18	<0.18	<0.086	<0.086	<0.086	--	<0.086	<0.16	--	0.84	--	<1	<1	<1	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.049	<0.036	<0.036	--	<0.036	<0.14	--	0.16	--	<0.27	<0.27	<0.26	<0.26
Total Radium	pCi/L	1.03	0.527	0.606	0.211	0.136	0.776	1.29	1.61	--	0.746	1.12	--	0.299	--	0.116	0.752	1.26	0.447
Radium-226	pCi/L	0.4	0.375	0.26	0.211	0.136	0.342	0.13	0.406	--	0.251	0.624	--	0.191	--	0.116	0.134	0.499	0.158
Radium-228	pCi/L	0.631	0.152	0.346	-0.0147	-0.0781	0.434	1.16	1.2	--	0.495	0.499	--	0.108	--	-0.0591	0.619	0.759	0.289
Field Specific Conductance	umhos/cm	1747	2228	2222	2279	2247	2220	2085	2991	2274	2248	2304	2357	1912	1473	2159	2184	1971	2100
Field Temperature	deg C	11.9	13.2	14.4	13.9	12.9	12.8	13.4	14	13.8	10.7	14.3	14.6	14.1	12.21	12.27	12.91	10.5	14.4
Groundwater Elevation	feet	655.63	655.65	655.52	655.67	655.46	656.35	655.65	655.13	655.4	655.71	656.05	655.89	656.91	656.03	657.23	660.14	656.45	655.8
Oxygen, Dissolved	mg/L	0.16	0.08	0.07	0.43	0.18	0.18	0.12	0.08	0.4	0.2	0.17	0.23	0.26	6.4	0.86	0.35	0.22	0.14
Turbidity	NTU	40.23	6.78	3.41	1.54	3.11	2.32	2.63	1.32	1.63	2.41	4.01	1.42	88.24	4.39	26.9	11.9	31.1	18.7
pH at 25 Degrees C	Std. Units	6.7	6.6	6.7	6.7	6.8	6.8	6.6	6.6	6.5	6.7	--	6.7	6.6	--	6.9	7.2	6.7	6.8
Field Oxidation Potential	millivolts	230.2	25	6.7	92.6	38.7	121.1	21	20.8	191.7	82.6	-336.6	--	114.2	70.2	68.3	-0.5	135.6	34.5
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<1.9
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	61	72
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	500	100
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50000	57000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	110	130
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1500	1900
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	250000	280000
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.81	--
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	200	140

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-303		Number of Sampling Dates: 18																		
Parameter Name	Units	4/26/2016	6/23/2016	8/10/2016	10/26/2016	1/18/2017	4/19/2017	6/20/2017	8/22/2017	11/8/2017	4/18/2018	8/14/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/24/2019	4/14/2020	10/8/2020	
Boron	ug/L	417	579	726	811	738	577	834	1180	1070	987	1010	--	549	--	290	440	420	1100	
Calcium	mg/L	179	172	180	204	173	226	210	200	234	212	213	--	195	--	170	170	170	210	
Chloride	mg/L	109	155	234	230	190	141	186	268	185	198	--	64.8	57	--	22	35	47	210	
Fluoride	mg/L	0.21	0.17	0.42	0.23	0.21	0.19	0.23	0.3	0.19	0.22	--	0.31	0.24	--	<0.23	<0.23	<0.23	0.26	
Field pH	Std. Units	7.08	7.08	6.51	6.62	6.77	7.02	6.81	6.53	6.6	6.63	6.83	7.03	6.66	6.83	7	6.83	6.98	8.28	
Sulfate	mg/L	183	190	200	208	168	333	284	215	348	328	--	164	389	--	260	180	180	190	
Total Dissolved Solids	mg/L	856	988	1170	1120	1030	1170	1210	1220	1290	1300	--	832	1150	--	890	810	810	1100	
Antimony	ug/L	0.23	0.32	0.25	0.14	0.19	0.16	0.19	0.3	--	0.098	0.16	--	0.2	--	<0.53	<0.53	<0.58	<0.51	
Arsenic	ug/L	0.89	0.91	0.51	0.46	0.54	0.47	0.33	0.61	--	0.43	0.6	--	0.55	--	<0.75	<0.75	<0.88	<0.88	
Barium	ug/L	68.2	78.5	88.1	98.8	75.3	79.1	76.4	83.8	--	69.5	77.3	--	95.2	--	54	77	64	94	
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	0.015	--	0.017	<0.12	--	<0.089	--	<0.27	<0.27	<0.27	--	
Cadmium	ug/L	0.24	0.28	0.47	0.59	0.31	0.81	0.52	0.57	--	0.44	0.36	--	0.24	--	0.092	0.21	0.18	0.46	
Chromium	ug/L	0.74	0.83	0.73	<0.34	0.52	0.27	0.37	0.61	--	0.12	0.19	--	0.15	--	<0.98	<0.98	<1.1	<1.1	
Cobalt	ug/L	2.2	2.5	2.6	3.1	2.6	1.8	1.9	2.8	--	2.1	2.2	--	1.7	--	0.42	1.2	0.87	2.4	
Lead	ug/L	0.31	<0.19	<0.19	0.2	<0.19	0.068	0.07	0.19	--	0.069	0.13	--	<0.13	--	<0.27	<0.27	<0.27	<0.11	
Lithium	ug/L	<4.9	8.3	5	5.8	<4.9	<2.9	3.4	8.1	--	<4.6	6.9	--	<4.6	--	<2.7	<2.7	4.7	5.6	
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.083	--	--	<0.09	<0.1	<0.1	<0.1	--	
Molybdenum	ug/L	3.3	3.6	0.77	0.87	0.64	3.9	0.81	0.64	--	0.61	0.98	--	5.5	--	7.5	5.2	3.6	<1.1	
Selenium	ug/L	0.38	0.43	0.36	0.28	0.8	1.1	0.47	0.52	--	0.23	0.35	--	0.37	--	2.1	<1	5	<1	
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.16	<0.036	<0.036	--	<0.036	<0.14	--	<0.099	--	<0.27	<0.27	<0.26	<0.26	
Total Radium	pCi/L	0.806	0.426	1.56	0.944	0.805	1.62	1.62	2.36	--	0.529	1.82	--	2.04	--	0.391	0.321	0.229	0.654	
Radium-226	pCi/L	0.163	0.0636	0.716	0	0.145	1.06	0.556	1.4	--	-0.088	1.02	--	0.478	--	0.172	0.0551	0.149	0.147	
Radium-228	pCi/L	0.643	0.362	0.842	0.944	0.66	0.556	1.06	0.958	--	0.529	0.799	--	1.56	--	0.22	0.265	0.0801	0.507	
Field Specific Conductance	umhos/cm	965	1176	1655	1730	1611	1687	1670	2474	1896	1862	1833	1161	1573	750	1181	1287	1097	1602	
Field Temperature	deg C	9.7	14.4	17.7	16.3	10.6	10.6	14.1	16.8	15.2	8.2	17.2	18.7	17.1	9.11	8.51	15.34	8.9	17	
Groundwater Elevation	feet	652.42	652.89	651.76	652.17	651.74	654.57	652.42	650.58	651.34	652.47	652.57	655.07	656.17	654.65	655.55	653.86	654.08	650.37	
Oxygen, Dissolved	mg/L	0.07	0.05	0.05	0.42	0.17	0.56	0.08	0.08	0.48	0.17	0.19	1.92	0.29	3.19	2.29	0.28	1.94	0.13	
Turbidity	NTU	27.66	4.48	4.42	2.32	3.3	2.2	2.77	14.62	3.67	3.69	1.51	10.13	5.99	14.2	3.49	4.24	12.1	30.2	
pH at 25 Degrees C	Std. Units	7	6.8	6.8	6.9	7.1	7.2	6.8	6.8	6.7	6.9	--	7.1	6.9	--	7.5	7.5	6.9	7	
Field Oxidation Potential	millivolts	181.1	-20.5	31.5	14.8	21.3	99.5	8.6	20.9	176.8	3.2	-307.9	--	32.8	73.7	51.7	-5.1	104.3	-0.4	
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470	
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	440	470	
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	310	
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23000	31000	
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220	1600	
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	960	1100	
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	100000	150000	
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--	
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<50	<50	
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	260	1600	

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-304		Number of Sampling Dates: 18																		
Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/22/2017	11/8/2017	4/18/2018	8/15/2018	8/29/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	4/13/2020	10/8/2020	
Boron	ug/L	965	968	911	991	995	1030	982	1040	1040	991	1000	--	930	--	1100	970	1000	1000	
Calcium	mg/L	124	123	112	125	122	129	126	130	136	131	138	--	123	--	130	120	130	120	
Chloride	mg/L	311	316	336	364	383	430	382	409	417	400	--	375	410	--	320	280	250	250	
Fluoride	mg/L	0.84	0.77	0.95	0.89	0.82	0.88	1	0.89	0.96	0.92	--	1	1	--	1.3	0.74	1.1	1.1	
Field pH	Std. Units	7.3	7.07	7.34	6.96	7.05	7.27	7.29	6.72	7	6.9	7.34	7.22	6.86	7.16	7.17	7.05	7.12	7.88	
Sulfate	mg/L	230	234	225	241	204	208	254	194	194	198	--	185	184	--	180	190	220	230	
Total Dissolved Solids	mg/L	1190	1160	1180	1270	1230	1310	1240	1250	1270	1300	--	3680	1180	--	1100	1100	1000	1200	
Antimony	ug/L	0.069	0.13	0.1	<0.058	0.1	<0.026	0.06	0.035	--	<0.026	0.19	--	<0.078	--	<0.53	<0.53	<0.58	<0.51	
Arsenic	ug/L	2.1	2.2	0.78	0.69	0.82	0.73	0.57	0.67	--	0.68	1.3	--	0.96	--	<0.75	0.83	0.96	<0.88	
Barium	ug/L	104	106	86.4	97.6	92.4	94.9	87.1	91.5	--	88.5	87.4	--	91	--	80	80	80	74	
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	0.026	0.21	--	<0.089	--	<0.27	<0.27	<0.27	--	
Cadmium	ug/L	<0.029	<0.029	0.072	<0.029	<0.029	<0.018	<0.018	<0.018	--	<0.018	0.17	--	0.073	--	<0.077	<0.039	<0.039	<0.049	
Chromium	ug/L	4.5	7.1	0.92	0.79	0.69	0.56	0.6	0.43	--	2	5.9	--	1.4	--	1.6	2	3.5	<1.1	
Cobalt	ug/L	0.89	1.1	<0.5	<0.5	<0.5	0.37	0.36	0.3	--	0.39	0.92	--	0.45	--	0.4	0.5	0.57	0.41	
Lead	ug/L	0.5	0.82	<0.19	<0.19	<0.19	0.13	0.081	0.041	--	0.37	0.81	--	0.66	--	<0.27	0.27	0.5	<0.11	
Lithium	ug/L	5.1	7.5	<4.9	<4.9	<4.9	<2.9	<2.9	5.3	--	<4.6	<4.6	--	<4.6	--	3.3	2.8	4.8	3.1	
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.083	--	--	<0.09	<0.1	<0.1	<0.1	--	
Molybdenum	ug/L	2.5	2.4	1.6	1.4	1.5	1.5	1.5	1.6	--	2	2.4	--	1.9	--	1.5	2.3	2	1.5	
Selenium	ug/L	0.23	0.32	<0.18	0.19	<0.18	0.17	0.14	0.21	--	<0.086	0.5	--	0.26	--	<1	<1	<1	<1	
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.042	<0.036	<0.036	--	<0.036	0.15	--	<0.099	--	<0.27	<0.27	<0.26	<0.26	
Total Radium	pCi/L	1.66	1.56	2.39	1.52	2.94	2.44	3.55	3.2	--	2.08	3.74	--	2.76	--	2.42	2.58	2.46	2.41	
Radium-226	pCi/L	0.706	0.431	0.465	0.327	1.33	0.894	1.62	1.2	--	1.22	1.78	--	1.21	--	1.23	1.08	1.2	1.21	
Radium-228	pCi/L	0.952	1.13	1.92	1.19	1.61	1.55	1.93	2	--	0.862	1.96	--	1.55	--	1.19	1.5	1.26	1.2	
Field Specific Conductance	umhos/cm	1580	1958	1948	2057	2052	2139	2029	2881	2205	2141	2085	2123	2058	1368	1876	1871	1764	1675	
Field Temperature	deg C	13	13.3	13.4	13	12.9	13.4	13.3	13.4	13.3	12.8	15.1	13.7	13.5	12.81	13.75	13.64	11.9	13.6	
Groundwater Elevation	feet	655.37	656.53	653.79	655.03	654.5	657.48	654.75	652.39	653.03	655.55	656.35	657.82	658.2	656.28	659.33	657.71	656.42	652.95	
Oxygen, Dissolved	mg/L	0.13	0.05	0.06	0.47	0.16	0.12	0.1	0.08	0.25	0.15	0.21	0.16	0.11	0.72	0.41	0.44	0.24	0.18	
Turbidity	NTU	61.01	92.4	2.66	1.46	1.17	1.95	1.64	0.92	3.88	39.29	81.42	55.94	17.12	4.38	57.9	18.9	54.1	11.1	
pH at 25 Degrees C	Std. Units	7	7	7.1	7	7.2	7.2	7.2	7	6.9	7	--	7.1	7	--	7.5	7.7	7.1	7.2	
Field Oxidation Potential	millivolts	-97.5	-109	67.9	-105.1	-79.3	-40.5	-66.6	-10.1	162.7	137.5	35.5	--	-114.5	-62.1	-58.3	-57.5	-119.8	-113	
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380	
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8	
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	370	380	
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5200	4200	
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	43000	40000	
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7700	7800	
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000	
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.37	--	
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	4600	4200	
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800	

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-305		Number of Sampling Dates: 18																	
Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/23/2017	11/8/2017	4/18/2018	8/15/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	3/13/2020	4/13/2020	10/9/2020
Boron	ug/L	888	906	832	878	956	907	889	903	925	886	911	835	--	1000	880	--	920	900
Calcium	mg/L	98.1	92.1	88.8	93.2	98.5	96.2	93.8	95.8	99.5	97.6	102	96.2	--	110	100	--	100	110
Chloride	mg/L	310	312	316	325	289	312	290	295	282	289	265	281	--	250	280	--	270	290
Fluoride	mg/L	0.35	0.29	0.33	0.37	0.35	0.38	0.4	0.48	0.4	0.4	0.44	0.4	--	0.75	<0.23	--	0.35	0.38
Field pH	Std. Units	7.23	6.94	7.18	6.94	6.96	7.3	7.06	6.88	7.01	6.9	7.21	6.86	6.99	7.06	6.91	7.02	7	7.44
Sulfate	mg/L	65.7	71.3	74	79.5	90	109	121	124	138	147	139	129	--	110	76	--	63	93
Total Dissolved Solids	mg/L	1040	982	1040	1010	1020	1040	1010	1040	1040	1070	1060	1070	--	1000	1000	--	960	1100
Antimony	ug/L	0.14	0.2	0.19	0.094	0.18	0.063	0.12	0.12	--	0.089	<0.15	0.096	--	<0.53	<0.53	--	<0.58	<0.51
Arsenic	ug/L	2.4	1.7	0.57	0.52	0.57	0.61	0.37	0.51	--	0.51	0.72	0.66	--	<0.75	<0.75	--	<0.88	<0.88
Barium	ug/L	131	120	108	115	117	115	110	114	--	116	118	125	--	120	110	--	110	120
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	--	<0.27	--
Cadmium	ug/L	0.051	<0.029	0.1	<0.029	<0.029	0.052	0.039	0.034	--	0.054	0.086	0.044	--	<0.077	0.087	--	0.14	0.097
Chromium	ug/L	1.3	0.8	0.62	1.3	<0.34	0.36	0.22	0.45	--	0.26	0.41	0.3	--	<0.98	<0.98	--	<1.1	<1.1
Cobalt	ug/L	14.8	15.1	13.7	14.8	15.2	14.6	14.4	14.7	--	14.5	15.6	17.2	16.4	17	17	18	16	17
Lead	ug/L	0.53	<0.19	<0.19	0.25	<0.19	0.093	<0.033	0.039	--	0.12	0.31	<0.13	--	<0.27	<0.27	--	0.27	<0.11
Lithium	ug/L	<4.9	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	<2.9	--	<4.6	<4.6	<4.6	--	<2.7	<2.7	2.3	3.2	<2.5
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.09	--	<0.09	<0.1	<0.1	--	<0.1	--
Molybdenum	ug/L	4.9	5.2	4.9	5.6	5.9	5.8	5.8	6	--	7.1	6.5	7.3	--	7.2	7.2	--	6.9	7.9
Selenium	ug/L	0.38	0.37	0.28	0.32	0.34	0.39	0.16	0.26	--	0.12	0.36	0.33	--	<1	<1	--	<1	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.34	0.29	0.36	--	0.32	0.33	0.33	--	0.33	0.38	--	0.35	0.35
Total Radium	pCi/L	0.693	0.716	2.17	1.3	1.46	0.673	0.996	1.08	--	0.676	1.33	1.56	--	0.685	0.383	--	0.909	0.483
Radium-226	pCi/L	0.281	0.127	0.583	0.714	0.162	0.494	0.301	0.291	--	0.278	0.96	0.635	--	0.339	0.186	--	0.42	0.217
Radium-228	pCi/L	0.412	0.589	1.59	0.589	1.3	0.179	0.695	0.793	--	0.398	0.366	0.921	--	0.347	0.197	--	0.489	0.265
Field Specific Conductance	umhos/cm	1469	1796	1769	1831	1794	1822	1730	2422	1738	1840	1832	1836	1235	1728	1794	1788	1772	1810
Field Temperature	deg C	13.1	13.2	13.1	13	12.8	13.2	13.3	13.3	13.2	12.8	14.8	13.9	12.43	13.8	13.2	12.4	9.1	14
Groundwater Elevation	feet	661.67	662.36	660.78	661.37	660.87	663.27	661.26	659	659.76	660.99	661.56	663.37	662.13	664.01	663.21	661.41	662.44	659.81
Oxygen, Dissolved	mg/L	0.11	0.05	0.07	0.47	0.09	0.15	0.06	0.12	0.2	0.15	0.18	0.09	0.81	0.59	0.42	0.2	0.28	0.13
Turbidity	NTU	35.09	5.77	1.32	0.84	0.5	0.51	1.9	0.58	2.68	7.37	14.9	6.96	4.76	21.7	6.21	42.68	21.7	12.9
pH at 25 Degrees C	Std. Units	7.1	7	7.1	7.2	7.3	7.4	7.1	7.1	7	7.3	7	7.1	--	7	7.5	--	7.2	7.2
Field Oxidation Potential	millivolts	52.5	-20.2	-38.9	5.8	24.2 mV	17.6	-4.5	-51.3	146.1	-32.7	31	-26.8	36.4	32.6	-6.7	192.6	6.6	-13
Iron	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	390	--	--
Manganese	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3200	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	460	300
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	330	200
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	47000	48000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3100	3400	3600
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7600	8300
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	210000	210000
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16	16	17
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	51	66	63
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3300	3600
Lithium, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<2.3	--	--



## Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-305A				
Number of Sampling Dates: 3				
Parameter Name	Units	3/13/2020	4/14/2020	10/9/2020
Boron	ug/L	250	280	180
Calcium	mg/L	100	130	150
Chloride	mg/L	40	89	120
Fluoride	mg/L	0.77	0.73	0.73
Field pH	Std. Units	8.09	7.63	7.46
Sulfate	mg/L	40	93	130
Total Dissolved Solids	mg/L	400	570	660
Antimony	ug/L	1.3	0.88	<0.51
Arsenic	ug/L	<0.88	<0.88	<0.88
Barium	ug/L	70	80	75
Beryllium	ug/L	<0.27	<0.27	--
Cadmium	ug/L	<0.039	<0.039	<0.049
Chromium	ug/L	<1.1	<1.1	<1.1
Cobalt	ug/L	2.4	2.7	1.5
Lead	ug/L	0.68	<0.27	<0.11
Lithium	ug/L	14	16	13
Mercury	ug/L	<0.1	<0.1	--
Molybdenum	ug/L	9	17	6.4
Selenium	ug/L	2.3	1.7	<1
Thallium	ug/L	<0.26	<0.26	<0.26
Total Radium	pCi/L	1.97	1.26	2.05
Radium-226	pCi/L	1.23	1.03	1.92
Radium-228	pCi/L	0.735	0.23	0.132
Field Specific Conductance	umhos/cm	745	807	1102
Field Temperature	deg C	11.8	11.2	14.2
Groundwater Elevation	feet	--	--	648.01
Oxygen, Dissolved	mg/L	3.79	2.26	0.19
Turbidity	NTU	63.2	4.91	0
pH at 25 Degrees C	Std. Units	--	7.3	7.3
Field Oxidation Potential	millivolts	204.2	106.7	11
Iron	ug/L	720	--	--
Manganese	ug/L	180	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	270	340
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	270	340
Iron, total	ug/L	--	64	64
Magnesium, total	ug/L	--	28000	31000
Manganese, dissolved	ug/L	150	240	160
Potassium, total	ug/L	--	3800	4200
Sodium	ug/L	--	46000	64000
Cobalt, Dissolved	ug/L	2.1	2.8	--
Iron, dissolved	ug/L	<50	<50	<50
Manganese, total	ug/L	--	260	150
Lithium, dissolved	ug/L	15	--	--

**Single Location**

**Name: IPL - Ottumwa Generating Station**

Location ID: MW-306																		
Number of Sampling Dates: 17																		
Parameter Name	Units	4/26/2016	6/23/2016	8/11/2016	10/27/2016	1/18/2017	4/19/2017	6/21/2017	8/23/2017	11/8/2017	4/18/2018	8/15/2018	10/16/2018	1/8/2019	4/8/2019	10/23/2019	4/14/2020	10/9/2020
Boron	ug/L	540	575	574	702	809	814	784	822	881	919	915	862	--	1100	980	1000	1100
Calcium	mg/L	101	88.5	85	90	85.9	81.3	75.6	73.9	73.1	74.1	78.9	80	--	95	77	73	80
Chloride	mg/L	85.8	77.6	67.9	64.9	57.2	58.5	56	54.4	50.4	54.4	58.2	83.3	--	98	47	41	43
Fluoride	mg/L	0.11	<0.073	0.086	0.11	0.087	0.11	<0.1	0.15	0.11	0.11	0.13	<0.19	--	0.27	<0.23	<0.23	<0.23
Field pH	Std. Units	7.08	6.17	6.72	6.44	6.51	6.79	6.71	6.46	6.49	6.42	6.74	6.42	6.65	6.66	6.74	6.68	6.54
Sulfate	mg/L	264	271	266	277	285	300	282	264	274	289	275	285	--	270	280	310	360
Total Dissolved Solids	mg/L	899	849	846	864	828	819	775	769	773	805	840	884	--	930	870	820	900
Antimony	ug/L	0.2	0.25	0.18	0.12	0.18	0.051	0.13	0.1	--	0.094	<0.15	0.1	--	<0.53	<0.53	<0.58	<0.51
Arsenic	ug/L	2.2	1.7	0.44	0.4	0.47	0.42	0.41	0.38	--	0.38	0.65	0.6	--	<0.75	0.78	<0.88	<0.88
Barium	ug/L	93	80.5	58	60.5	56.4	54.3	48.7	47.4	--	48.2	51.6	56	--	58	51	48	49
Beryllium	ug/L	<0.08	<0.08	<0.08	<0.08	<0.08	<0.012	<0.012	<0.012	--	<0.012	<0.12	<0.089	--	<0.27	<0.27	<0.27	--
Cadmium	ug/L	0.87	0.98	0.93	0.91	0.74	0.72	0.65	0.72	--	0.88	0.76	0.96	--	1.1	0.89	0.83	0.92
Chromium	ug/L	1.9	2.3	0.82	0.6	0.68	0.52	0.57	0.58	--	0.37	0.7	0.46	--	<0.98	1	<1.1	<1.1
Cobalt	ug/L	8.3	7.7	6.4	6.6	6	5.7	5.2	5	--	4.8	5.5	6.4	6.2	6.9	6.2	5.5	5.9
Lead	ug/L	0.74	0.74	<0.19	<0.19	<0.19	0.038	0.1	<0.033	--	0.04	0.2	<0.13	--	<0.27	0.34	0.37	<0.11
Lithium	ug/L	<4.9	<4.9	<4.9	<4.9	<4.9	<2.9	<2.9	<2.9	--	<4.6	<4.6	<4.6	--	<2.7	<2.7	<2.3	<2.5
Mercury	ug/L	<0.039	<0.039	<0.039	<0.039	<0.039	<0.046	<0.046	<0.046	--	<0.09	<0.083	--	<0.09	<0.1	<0.1	<0.1	--
Molybdenum	ug/L	4.8	4.8	4.5	4.8	4.7	4.7	4.6	4.4	--	5.7	4.7	5.1	--	4.3	4.9	4.4	5.6
Selenium	ug/L	0.3	0.3	<0.18	0.24	0.2	<0.086	0.088	0.13	--	<0.086	0.21	0.22	--	<1	<1	<1	<1
Thallium	ug/L	<0.5	<0.5	<0.5	<0.5	<0.5	0.14	0.082	<0.036	--	0.083	<0.14	0.12	--	<0.27	<0.27	<0.26	<0.26
Total Radium	pCi/L	1.14	1.25	0.958	0.868	0.435	0.213	1.03	1.3	--	0.305	0.985	0.693	--	0.155	0.624	0.0738	0.889
Radium-226	pCi/L	0.179	0.475	0	0.253	-0.15	0.0761	0	0.517	--	0.305	0.482	0.263	--	0.0529	-0.00408	0.0738	0.163
Radium-228	pCi/L	0.962	0.774	0.958	0.615	0.435	0.137	1.03	0.784	--	-0.109	0.503	0.43	--	0.102	0.624	-0.118	0.727
Field Specific Conductance	umhos/cm	960	1271	1228	1262	1215	1210	1151	1576	1186	1228	1271	1340	965	1350	1266	1158	1294
Field Temperature	deg C	9.7	12.7	12.8	13.5	13.6	13.2	13.4	13.2	13.6	13.1	14.6	13.4	13.31	13.63	13.12	11.7	13.4
Groundwater Elevation	feet	670.86	670.64	670.35	670.21	669.89	670.69	669.94	668.77	669.04	668.92	668.66	670.24	669.84	670.96	671.28	670.71	670.18
Oxygen, Dissolved	mg/L	0.07	0.07	0.02	0.4	0.13	0.21	0.07	0.08	0.18	0.14	0.15	0.08	0.47	0.92	0.29	0.21	0.12
Turbidity	NTU	25.21	8.19	1.89	1	0.49	0.13	0.14	0.74	0.82	0.59	3.95	7.07	0.89	28.5	12.3	15.7	14
pH at 25 Degrees C	Std. Units	6.6	6.6	6.6	6.7	6.9	7	6.8	6.7	6.5	6.9	6.6	6.7	--	6.6	7.4	6.8	6.8
Field Oxidation Potential	millivolts	174.7	56	8.6	43.3	44.2	70.9	15.1	-10.5	174.1	14.2	22.8	13.3	59.5	49.1	-0.5	49.7	41.4
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	280	160
Iron, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	590	340
Magnesium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	26000	23000
Manganese, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	15000
Potassium, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3700	3800
Sodium	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	160000	170000
Cobalt, Dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.4	5.1
Iron, dissolved	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	100
Manganese, total	ug/L	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16000	16000

## Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-310						
Number of Sampling Dates: 5						
Parameter Name	Units	10/24/2019	2/5/2020	3/12/2020	4/13/2020	10/12/2020
Boron	ug/L	720	620	--	550	800
Calcium	mg/L	230	160	--	200	180
Chloride	mg/L	150	120	--	130	150
Fluoride	mg/L	0.31	0.85	--	1.1	1
Field pH	Std. Units	7.15	7.08	6.89	7	7.07
Sulfate	mg/L	610	530	--	590	570
Total Dissolved Solids	mg/L	260	1200	--	1300	1200
Antimony	ug/L	<0.53	<0.58	--	<0.58	0.61
Arsenic	ug/L	0.78	<0.88	--	<0.88	0.94
Barium	ug/L	76	53	--	62	55
Beryllium	ug/L	<0.27	<0.27	--	<0.27	--
Cadmium	ug/L	0.22	0.12	--	0.16	0.29
Chromium	ug/L	<0.98	<1.1	--	<1.1	<1.1
Cobalt	ug/L	0.57	0.32	0.32	0.24	0.38
Lead	ug/L	<0.27	<0.27	--	<0.27	<0.11
Lithium	ug/L	35	42	46	48	42
Mercury	ug/L	<0.1	<0.1	--	<0.1	--
Molybdenum	ug/L	26	29	--	31	39
Selenium	ug/L	5	3.3	--	4.5	2.4
Thallium	ug/L	<0.27	<0.26	--	<0.26	<0.26
Total Radium	pCi/L	0.411	0.0344	--	0.271	0.429
Radium-226	pCi/L	-0.0393	0.0344	--	0.0494	0.0766
Radium-228	pCi/L	0.411	-0.137	--	0.222	0.353
Field Specific Conductance	umhos/cm	1906	1723	1902	1823	1709
Field Temperature	deg C	13.74	12.49	12.8	10.3	13.9
Groundwater Elevation	feet	649.31 ft	644.71	645.45	645.91	638.46
Oxygen, Dissolved	mg/L	0.41	0.68	0.3	0.22	0.16
Turbidity	NTU	2.29	0.9	2.77	0.87	0.02
pH at 25 Degrees C	Std. Units	7.2	7.1	--	7	7.3
Field Oxidation Potential	millivolts	-9.3	42.2	252.2	179.4	146.5
Manganese	ug/L	--	--	260	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	190	410
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	190	410
Iron, total	ug/L	--	--	--	<50	<50
Magnesium, total	ug/L	--	--	--	86000	76000
Manganese, dissolved	ug/L	--	--	250	280	350
Potassium, total	ug/L	--	--	--	12000	12000
Sodium	ug/L	--	--	--	100000	100000
Cobalt, Dissolved	ug/L	--	--	0.31	0.23	--
Iron, dissolved	ug/L	--	--	<50	<50	<50
Manganese, total	ug/L	--	--	--	280	390
Lithium, dissolved	ug/L	--	--	45	--	44

## Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-310A		Number of Sampling Dates: 3		
Parameter Name	Units	3/13/2020	4/14/2020	10/12/2020
Boron	ug/L	1500	1600	1700
Calcium	mg/L	82	87	94
Chloride	mg/L	140	130	130
Fluoride	mg/L	1.7	1.8	2
Field pH	Std. Units	7.73	7.85	7.48
Sulfate	mg/L	1200	1100	1100
Total Dissolved Solids	mg/L	2300	2300	2200
Antimony	ug/L	<0.58	<0.58	<0.51
Arsenic	ug/L	<0.88	<0.88	<0.88
Barium	ug/L	16	16	16
Beryllium	ug/L	<0.27	<0.27	--
Cadmium	ug/L	<0.039	<0.039	<0.049
Chromium	ug/L	<1.1	<1.1	<1.1
Cobalt	ug/L	0.63	0.39	0.43
Lead	ug/L	<0.27	<0.27	<0.11
Lithium	ug/L	250	290	240
Mercury	ug/L	<0.1	<0.1	--
Molybdenum	ug/L	2.6	2.7	3
Selenium	ug/L	<1	<1	<1
Thallium	ug/L	<0.26	<0.26	<0.26
Total Radium	pCi/L	3.43	3.9	4.46
Radium-226	pCi/L	3.27	3.48	3.9
Radium-228	pCi/L	0.157	0.418	0.563
Field Specific Conductance	umhos/cm	3160	2915	3122
Field Temperature	deg C	12.5	8.8	13.1
Groundwater Elevation	feet	--	--	640.2
Oxygen, Dissolved	mg/L	6.28	6.39	0.48
Turbidity	NTU	109	--	0
pH at 25 Degrees C	Std. Units	--	7.5	7.7
Field Oxidation Potential	millivolts	178.9	146.1	89.7
Iron	ug/L	99	--	--
Manganese	ug/L	51	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	320	260
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	320	260
Iron, total	ug/L	--	230	280
Magnesium, total	ug/L	--	41000	45000
Manganese, dissolved	ug/L	53	39	29
Potassium, total	ug/L	--	9900	11000
Sodium	ug/L	--	630000	620000
Cobalt, Dissolved	ug/L	0.67	0.4	--
Iron, dissolved	ug/L	<50	220	<50
Manganese, total	ug/L	--	38	31
Lithium, dissolved	ug/L	250	--	230

## Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-311						
Number of Sampling Dates: 5						
Parameter Name	Units	10/24/2019	2/5/2020	3/13/2020	4/13/2020	10/12/2020
Boron	ug/L	<110	<100	--	<100	<80
Calcium	mg/L	170	130	--	170	160
Chloride	mg/L	13	14	--	13	14
Fluoride	mg/L	<0.23	<0.23	--	<0.23	<0.23
Field pH	Std. Units	6.95	6.72	7.11	6.86	6.93
Sulfate	mg/L	47	54	--	54	70
Total Dissolved Solids	mg/L	530	520	--	570	640
Antimony	ug/L	<0.53	<0.58	--	<0.58	<0.51
Arsenic	ug/L	<0.75	<0.88	--	<0.88	1.7
Barium	ug/L	200	160	--	180	220
Beryllium	ug/L	<0.27	<0.27	--	<0.27	--
Cadmium	ug/L	0.04	<0.039	--	<0.039	0.12
Chromium	ug/L	<0.98	<1.1	--	<1.1	<1.1
Cobalt	ug/L	0.78	0.11	<0.091	<0.091	2.2
Lead	ug/L	<0.27	<0.27	--	<0.27	1.8
Lithium	ug/L	4.7	2.9	4.7	6.2	4.6
Mercury	ug/L	<0.1	<0.1	--	<0.1	--
Molybdenum	ug/L	<1.1	<1.1	--	<1.1	<1.1
Selenium	ug/L	<1	1.2	--	<1	<1
Thallium	ug/L	<0.27	<0.26	--	<0.26	<0.26
Total Radium	pCi/L	0.386	0.108	--	0.17	0.738
Radium-226	pCi/L	0.0831	0.0368	--	0.0742	0.247
Radium-228	pCi/L	0.303	0.0711	--	0.0963	0.491
Field Specific Conductance	umhos/cm	926	891	877	912	1024
Field Temperature	deg C	13.88	10.21	10	8.8	14.4
Groundwater Elevation	feet	647.8	645	644.18	646.79	638.73
Oxygen, Dissolved	mg/L	0.29	2.11	0.23	0.29	7.12
Turbidity	NTU	3.88	1.89	3.44	0.44	0
pH at 25 Degrees C	Std. Units	7	7.1	--	6.9	6.9
Field Oxidation Potential	millivolts	-24.7	21	222.6	103.4	-53
Iron	ug/L	--	--	<50	--	--
Manganese	ug/L	--	--	20	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	--	--	460	290
Carbonate Alkalinity as CaCO3	mg/L	--	--	--	<1.9	<3.8
Total Alkalinity as CaCO3	mg/L	--	--	--	460	290
Iron, total	ug/L	--	--	--	<50	630
Magnesium, total	ug/L	--	--	--	40000	40000
Manganese, dissolved	ug/L	--	--	21	39	75
Potassium, total	ug/L	--	--	--	620	810
Sodium	ug/L	--	--	--	5000	5100
Cobalt, Dissolved	ug/L	--	--	0.11	<0.091	--
Iron, dissolved	ug/L	--	--	<50	<50	<50
Manganese, total	ug/L	--	--	--	41	180
Lithium, dissolved	ug/L	--	--	8	--	--

## Single Location

Name: IPL - Ottumwa Generating Station

Location ID: MW-311A					
Number of Sampling Dates: 4					
Parameter Name	Units	3/13/2020	4/13/2020	6/30/2020	10/8/2020
Boron	ug/L	1400	1500	--	1600
Calcium	mg/L	44	48	--	51
Chloride	mg/L	130	140	--	150
Fluoride	mg/L	3.4	4.1	3.7	4.4
Field pH	Std. Units	7.85	8.4	7.64	8.33
Sulfate	mg/L	1200	1200	--	1200
Total Dissolved Solids	mg/L	2300	2400	--	2400
Antimony	ug/L	<0.58	<0.58	--	<0.51
Arsenic	ug/L	<0.88	<0.88	--	<0.88
Barium	ug/L	20	20	--	15
Beryllium	ug/L	<0.27	<0.27	--	--
Cadmium	ug/L	<0.039	<0.039	--	<0.049
Chromium	ug/L	<1.1	<1.1	--	<1.1
Cobalt	ug/L	0.19	0.13	--	0.12
Lead	ug/L	<0.27	<0.27	--	<0.11
Lithium	ug/L	260	310	--	240
Mercury	ug/L	<0.1	<0.1	--	--
Molybdenum	ug/L	1.2	2.8	--	3.1
Selenium	ug/L	<1	<1	--	<1
Thallium	ug/L	<0.26	<0.26	--	<0.26
Total Radium	pCi/L	1.47	2.31	--	3.1
Radium-226	pCi/L	1.42	2.1	--	2.22
Radium-228	pCi/L	0.0555	0.214	--	0.88
Field Specific Conductance	umhos/cm	3336	3027	3391	3177
Field Temperature	deg C	12.1	7.9	12.6	12.7
Groundwater Elevation	feet	--	--	647.73	641.09
Oxygen, Dissolved	mg/L	2.29	3.87	1.51	0.44
Turbidity	NTU	7.74	3.19	1.43	0
pH at 25 Degrees C	Std. Units	--	7.9	--	7.9
Field Oxidation Potential	millivolts	206	115.8	23.4	39.6
Iron	ug/L	<50	--	--	--
Manganese	ug/L	20	--	--	--
Bicarbonate Alkalinity as CaCO3	mg/L	--	360	--	400
Carbonate Alkalinity as CaCO3	mg/L	--	<1.9	--	<3.8
Total Alkalinity as CaCO3	mg/L	--	360	--	400
Iron, total	ug/L	--	<50	--	<50
Magnesium, total	ug/L	--	23000	--	25000
Manganese, dissolved	ug/L	20	22	--	5.8
Potassium, total	ug/L	--	9000	--	10000
Sodium	ug/L	--	710000	--	700000
Cobalt, Dissolved	ug/L	0.36	0.12	--	--
Iron, dissolved	ug/L	<50	<50	--	<50
Manganese, total	ug/L	--	13	--	8.3
Lithium, dissolved	ug/L	250	--	--	230

# Appendix E

## Statistical Evaluation

# Confidence Interval

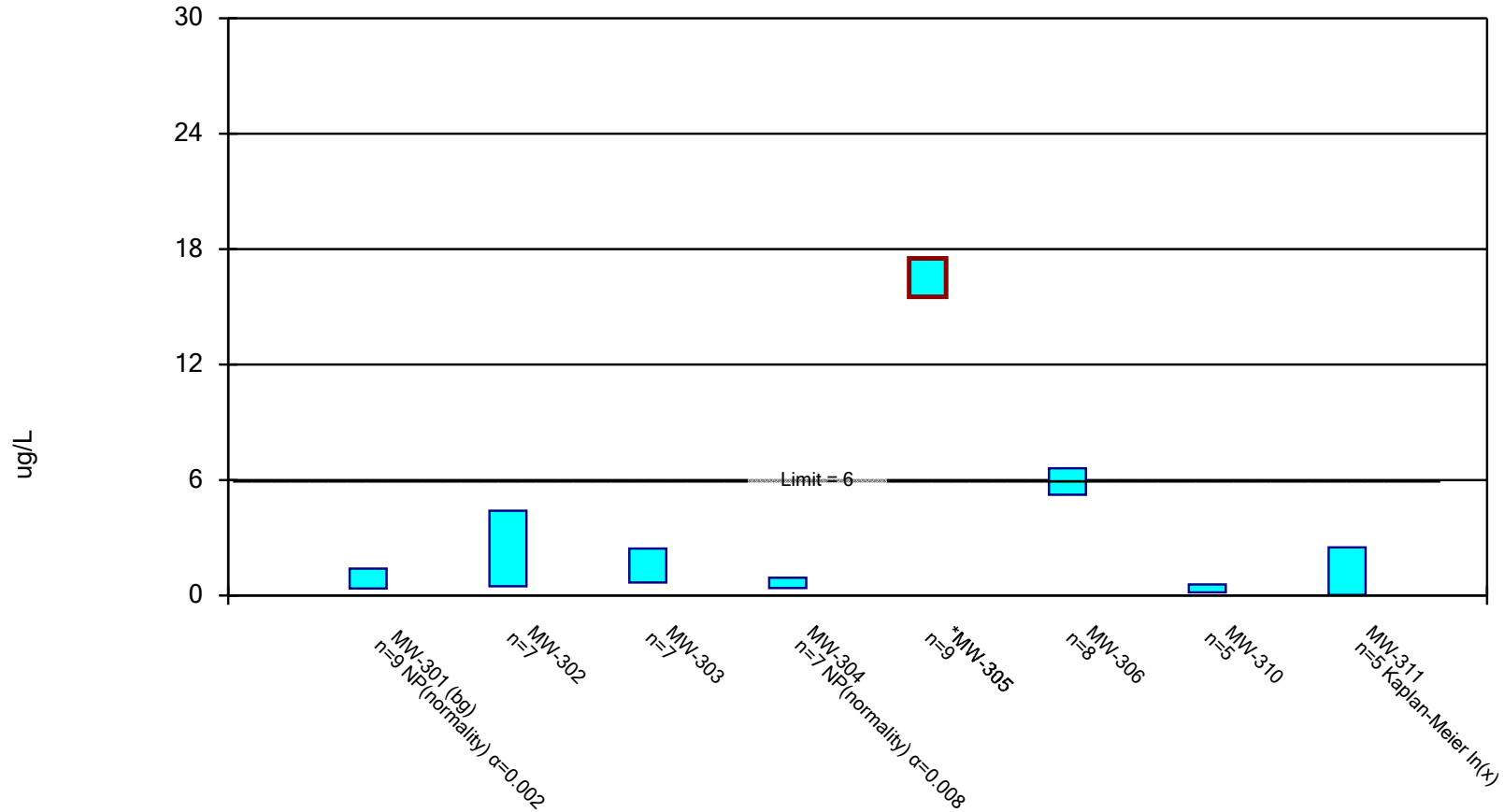
Ottumwa Generating Station    Client: SCS Engineers    Data: OGS\_CP\_Export\_201122    Printed 1/7/2021, 5:05 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>ND Adj.</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (ug/L)	MW-301 (bg)	1.4	0.36	6	No	9	0	None	No	0.002	NP (normality)
Cobalt (ug/L)	MW-302	4.404	0.4816	6	No	7	0	None	No	0.01	Param.
Cobalt (ug/L)	MW-303	2.441	0.6706	6	No	7	0	None	No	0.01	Param.
Cobalt (ug/L)	MW-304	0.92	0.39	6	No	7	0	None	No	0.008	NP (normality)
<b>Cobalt (ug/L)</b>	<b>MW-305</b>	<b>17.52</b>	<b>15.52</b>	<b>6</b>	<b>Yes</b>	<b>9</b>	<b>0</b>	<b>None</b>	<b>No</b>	<b>0.01</b>	<b>Param.</b>
Cobalt (ug/L)	MW-306	6.614	5.236	6	No	8	0	None	No	0.01	Param.
Cobalt (ug/L)	MW-310	0.5745	0.1575	6	No	5	0	None	No	0.01	Param.
Cobalt (ug/L)	MW-311	2.504	0.03013	6	No	5	40	Kapla...	ln(x)	0.01	Param.
Fluoride (mg/L)	MW-301 (bg)	0.44	0.22	4	No	8	37.5	None	No	0.004	NP (normality)
Fluoride (mg/L)	MW-302	0.2372	0.1895	4	No	8	50	Kapla...	No	0.01	Param.
Fluoride (mg/L)	MW-303	0.2698	0.1889	4	No	8	37.5	Kapla...	No	0.01	Param.
Fluoride (mg/L)	MW-304	1.187	0.8432	4	No	8	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-305	0.5624	0.2835	4	No	8	12.5	None	ln(x)	0.01	Param.
Fluoride (mg/L)	MW-306	0.1904	0.08128	4	No	8	50	Kapla...	No	0.01	Param.
Fluoride (mg/L)	MW-310	1.614	0.01585	4	No	4	0	None	No	0.01	Param.
Fluoride (mg/L)	MW-311	0.23	0.23	4	No	4	100	None	No	0.0625	NP (NDs)
Fluoride (mg/L)	MW-311A	4.898	2.902	4	No	4	0	None	No	0.01	Param.
Lithium (ug/L)	MW-301 (bg)	24.59	17.41	40	No	9	0	None	No	0.01	Param.
Lithium (ug/L)	MW-302	10.84	7.329	40	No	7	0	None	No	0.01	Param.
Lithium (ug/L)	MW-303	6.9	2.7	40	No	7	57.14	None	No	0.008	NP (NDs)
Lithium (ug/L)	MW-304	4.8	2.8	40	No	7	42.86	None	No	0.008	NP (normality)
Lithium (ug/L)	MW-305	4.6	2.3	40	No	8	75	None	No	0.004	NP (NDs)
Lithium (ug/L)	MW-306	4.6	2.3	40	No	7	100	None	No	0.008	NP (NDs)
Lithium (ug/L)	MW-310	50.94	34.26	40	No	5	0	None	No	0.01	Param.
Lithium (ug/L)	MW-311	6.579	2.661	40	No	5	0	None	No	0.01	Param.



## Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.\* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Cobalt Analysis Run 1/7/2021 5:01 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

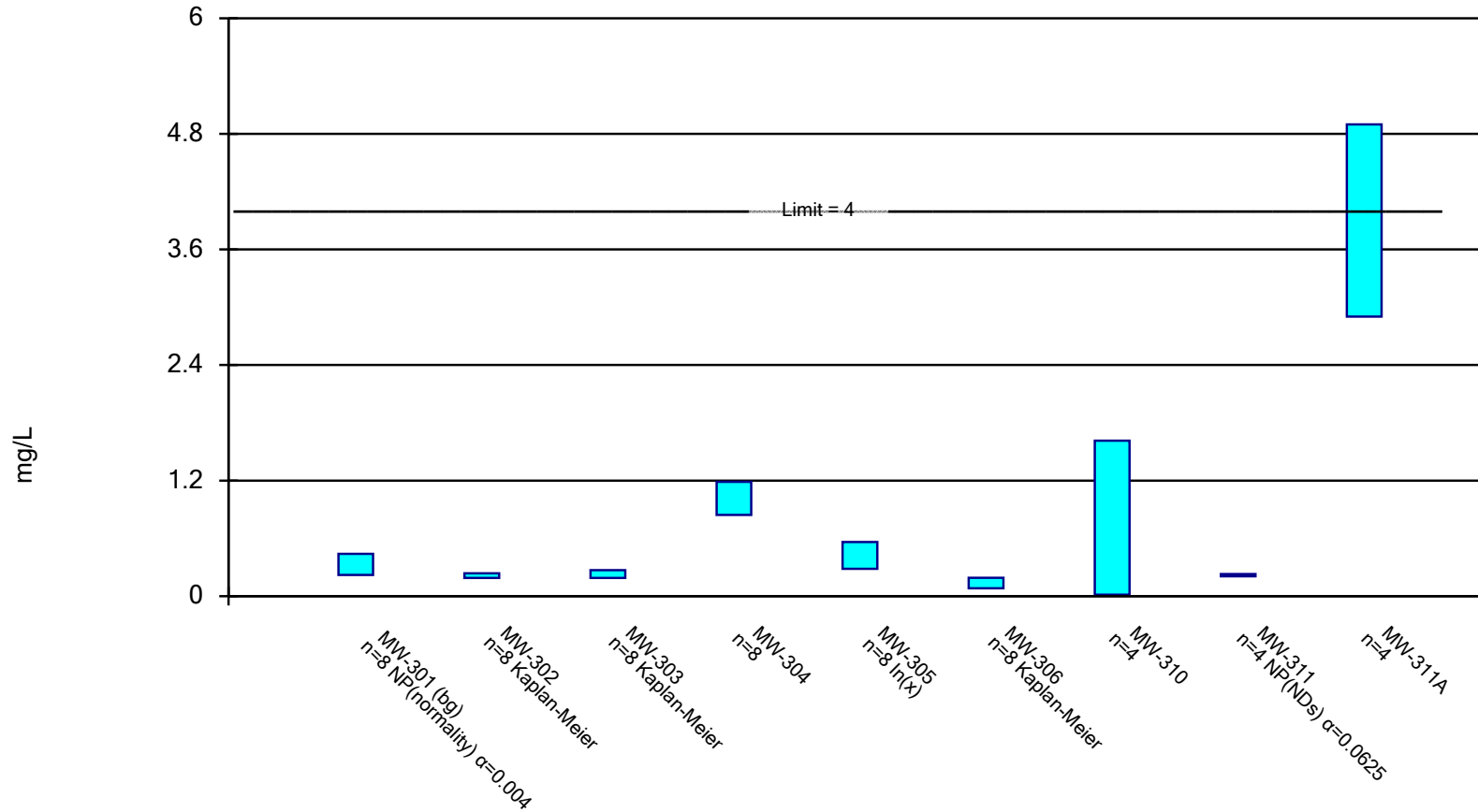
## Confidence Interval

Constituent: Cobalt (ug/L)    Analysis Run 1/7/2021 5:05 PM    View: OGS - Ash Pond  
 Ottumwa Generating Station    Client: SCS Engineers    Data: OGS\_CP\_Export\_201122

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311
4/18/2018	0.46 (J)	0.9 (J)	2.1	0.39 (J)	14.5	4.8		
8/14/2018	1.4	1.5	2.2					
8/15/2018				0.92 (J)	15.6	5.5		
10/16/2018	0.36 (J)	4	1.7	0.45 (J)	17.2	6.4		
1/8/2019					16.4	6.2		
4/8/2019	0.44 (J)	1.2	0.42 (J)	0.4 (J)	17	6.9		
10/23/2019				0.5	17	6.2		
10/24/2019	0.6	2.7	1.2				0.57	0.78
2/5/2020	1.1						0.32 (J)	0.11 (J)
3/12/2020	0.43 (J)						0.32 (J)	
3/13/2020					18			<0.091 (U)
4/13/2020				0.57	16		0.24 (J)	<0.091 (U)
4/14/2020	0.52	5.3	0.87			5.5		
10/8/2020	0.41 (J)	1.5	2.4	0.41 (J)				
10/9/2020					17	5.9		
10/12/2020							0.38 (J)	2.2
Mean	0.6356	2.443	1.556	0.52	16.52	5.925	0.366	0.6362
Std. Dev.	0.3628	1.651	0.7452	0.1876	1.034	0.6497	0.1244	0.9275
Upper Lim.	1.4	4.404	2.441	0.92	17.52	6.614	0.5745	2.504
Lower Lim.	0.36	0.4816	0.6706	0.39	15.52	5.236	0.1575	0.03013

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Fluoride Analysis Run 1/7/2021 5:01 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

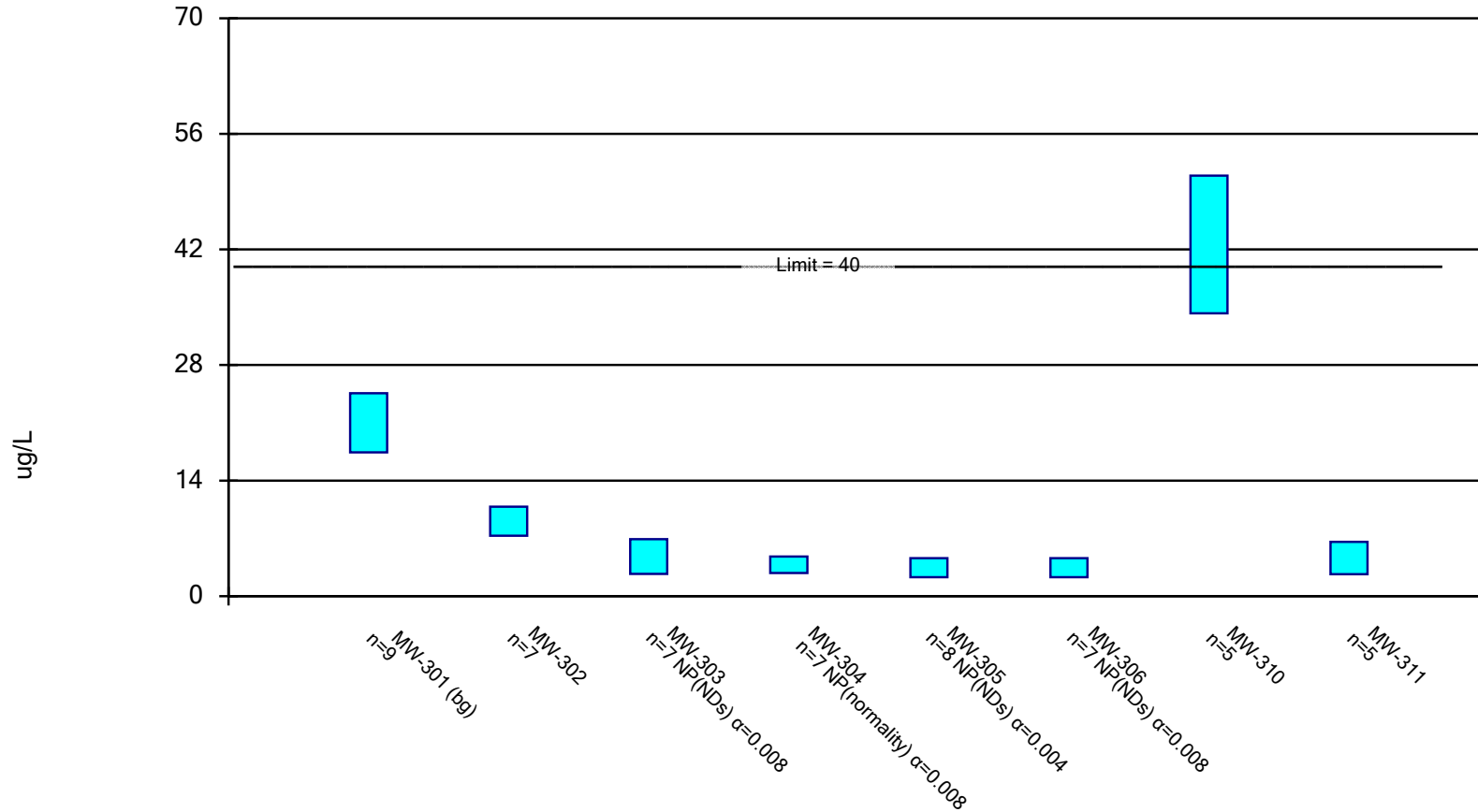
## Confidence Interval

Constituent: Fluoride (mg/L) Analysis Run 1/7/2021 5:05 PM View: OGS - Ash Pond  
 Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311	MW-311A
11/8/2017	0.27	0.2 (J)	0.19 (J)	0.96	0.4	0.11 (J)			
4/18/2018	0.22	0.26	0.22	0.92	0.4	0.11 (J)			
8/15/2018					0.44	0.13 (J)			
8/29/2018	0.27	0.26	0.31	1					
10/16/2018	0.3	0.24	0.24	1	0.4	<0.19 (U)			
4/8/2019	0.44 (J)	<0.23 (U)	<0.23 (U)	1.3	0.75	0.27 (J)			
10/23/2019				0.74	<0.23 (U)	<0.23 (U)			
10/24/2019	<0.23 (U)	<0.23 (U)	<0.23 (U)				0.31 (J)	<0.23 (U)	
2/5/2020							0.85	<0.23 (U)	
3/13/2020									3.4
4/13/2020				1.1	0.35 (J)		1.1	<0.23 (U)	4.1
4/14/2020	<0.23 (U)	<0.23 (U)	<0.23 (U)			<0.23 (U)			
6/30/2020									3.7
10/8/2020	<0.23 (U)	<0.23 (U)	0.26 (J)	1.1					4.4
10/9/2020					0.38 (J)	<0.23 (U)			
10/12/2020							1	<0.23 (U)	
Mean	0.2738	0.235	0.2388	1.015	0.4188	0.1875	0.815	0.23	3.9
Std. Dev.	0.07269	0.01927	0.03482	0.162	0.1479	0.06274	0.352	0	0.4397
Upper Lim.	0.44	0.2372	0.2698	1.187	0.5624	0.1904	1.614	0.23	4.898
Lower Lim.	0.22	0.1895	0.1889	0.8432	0.2835	0.08128	0.01585	0.23	2.902

## Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.



Constituent: Lithium Analysis Run 1/7/2021 5:01 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

# Confidence Interval

Constituent: Lithium (ug/L)    Analysis Run 1/7/2021 5:05 PM    View: OGS - Ash Pond  
 Ottumwa Generating Station    Client: SCS Engineers    Data: OGS\_CP\_Export\_201122

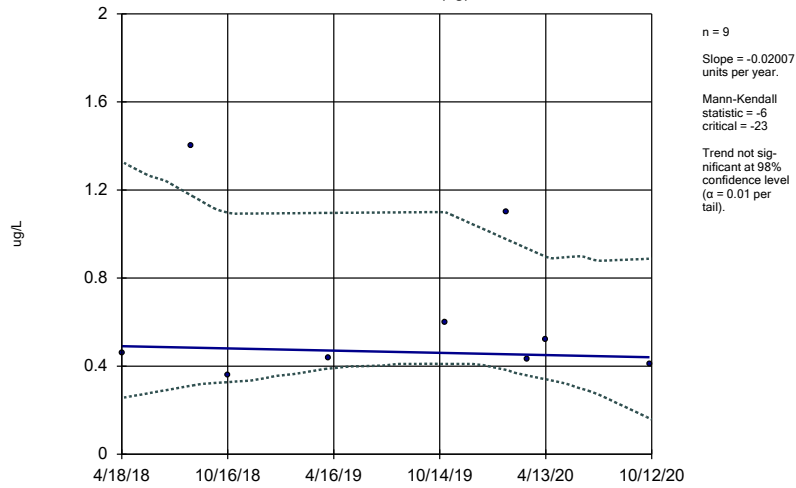
	MW-301 (bg)	MW-302	MW-303	MW-304	MW-305	MW-306	MW-310	MW-311
4/18/2018	19.1	7.5 (J)	<4.6 (U)	<4.6 (U)	<4.6 (U)	<4.6 (U)		
8/14/2018	26.5	6.9 (J)	6.9 (J)					
8/15/2018				<4.6 (U)	<4.6 (U)	<4.6 (U)		
10/16/2018	19.4	8.6 (J)	<4.6 (U)	<4.6 (U)	<4.6 (U)	<4.6 (U)		
4/8/2019	15	10	<2.7 (U)	3.3 (J)	<2.7 (U)	<2.7 (U)		
10/23/2019				2.8 (J)	<2.7 (U)	<2.7 (U)		
10/24/2019	24	10	<2.7 (U)				35	4.7 (J)
2/5/2020	17						42	2.9 (J)
3/12/2020	21						46	
3/13/2020					2.3 (J)			4.7 (J)
4/13/2020				4.8 (J)	3.2 (J)		48	6.2 (J)
4/14/2020	24	11	4.7 (J)			<2.3 (U)		
10/8/2020	23	9.6 (J)	5.6 (J)	3.1 (J)				
10/9/2020					<2.5 (U)	<2.5 (U)		
10/12/2020							42	4.6 (J)
<b>Mean</b>	21	9.086	4.543	3.971	3.4	3.429	42.6	4.62
<b>Std. Dev.</b>	3.715	1.479	1.5	0.8616	1.025	1.104	4.98	1.169
<b>Upper Lim.</b>	24.59	10.84	6.9	4.8	4.6	4.6	50.94	6.579
<b>Lower Lim.</b>	17.41	7.329	2.7	2.8	2.3	2.3	34.26	2.661

# Trend Test

Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122 Printed 1/7/2021, 5:42 PM

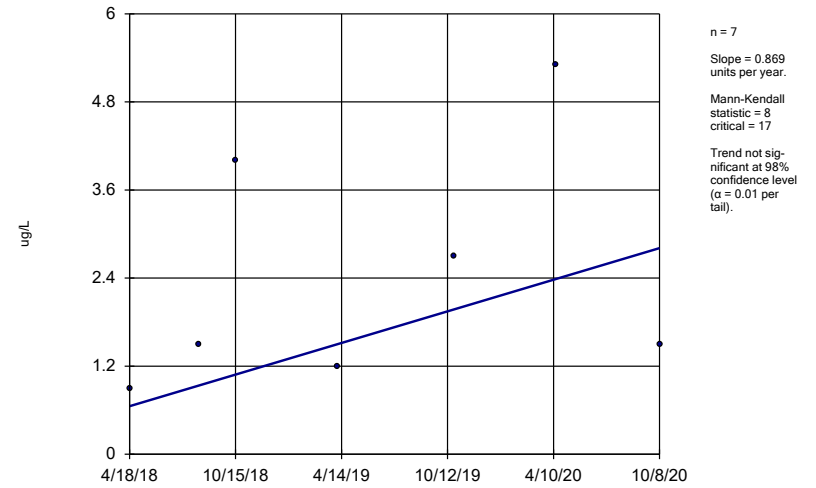
<u>Constituent</u>	<u>Well</u>	<u>Slope</u>	<u>Calc.</u>	<u>Critical</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Normality</u>	<u>Xform</u>	<u>Alpha</u>	<u>Method</u>
Cobalt (ug/L)	MW-301 (bg)	-0.02007	-6	-23	No	9	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-302	0.869	8	17	No	7	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-303	-0.5549	-3	-17	No	7	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-304	0.008075	3	17	No	7	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-305	0.7573	13	23	No	9	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-305A	-1.564	NaN	NaN	No	3	0	n/a	n/a	NaN	NP
Cobalt (ug/L)	MW-306	0.2686	4	20	No	8	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-310	-0.3127	-3	-10	No	5	0	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-310A	-0.3427	NaN	NaN	No	3	0	n/a	n/a	NaN	NP
Cobalt (ug/L)	MW-311	-0.1731	-1	-10	No	5	40	n/a	n/a	0.02	NP
Cobalt (ug/L)	MW-311A	-0.1222	NaN	NaN	No	3	0	n/a	n/a	NaN	NP

Cobalt  
MW-301 (bg)



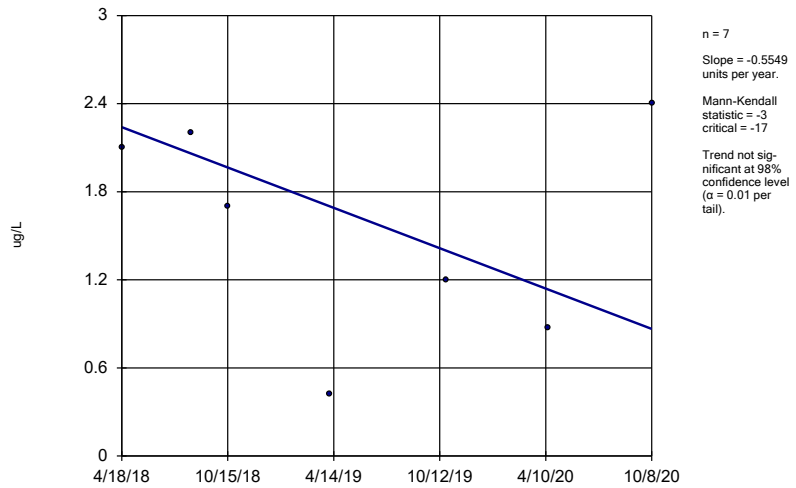
Sen's Slope and 95% Confidence Band Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

Cobalt  
MW-302



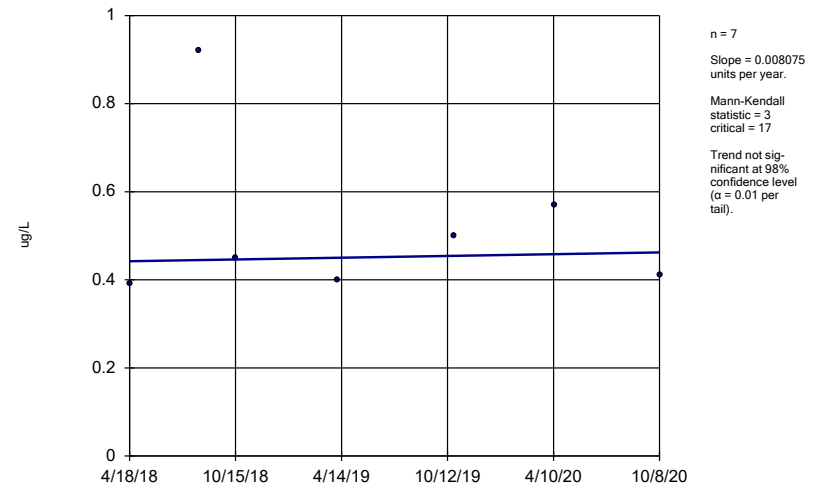
Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

Cobalt  
MW-303



Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

Cobalt  
MW-304



Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122



# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-301 (bg)
4/18/2018	0.46 (J)
8/14/2018	1.4
10/16/2018	0.36 (J)
4/8/2019	0.44 (J)
10/24/2019	0.6
2/5/2020	1.1
3/12/2020	0.43 (J)
4/14/2020	0.52
10/8/2020	0.41 (J)

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

MW-302

4/18/2018	0.9 (J)
8/14/2018	1.5
10/16/2018	4
4/8/2019	1.2
10/24/2019	2.7
4/14/2020	5.3
10/8/2020	1.5

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

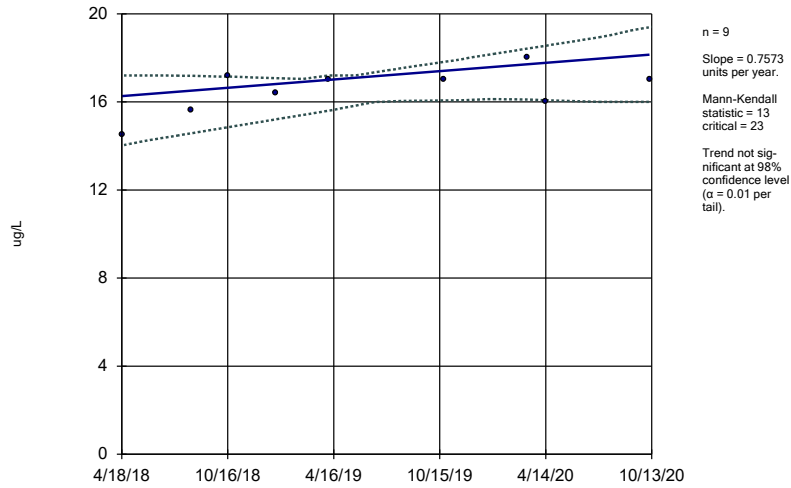
	MW-303
4/18/2018	2.1
8/14/2018	2.2
10/16/2018	1.7
4/8/2019	0.42 (J)
10/24/2019	1.2
4/14/2020	0.87
10/8/2020	2.4

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

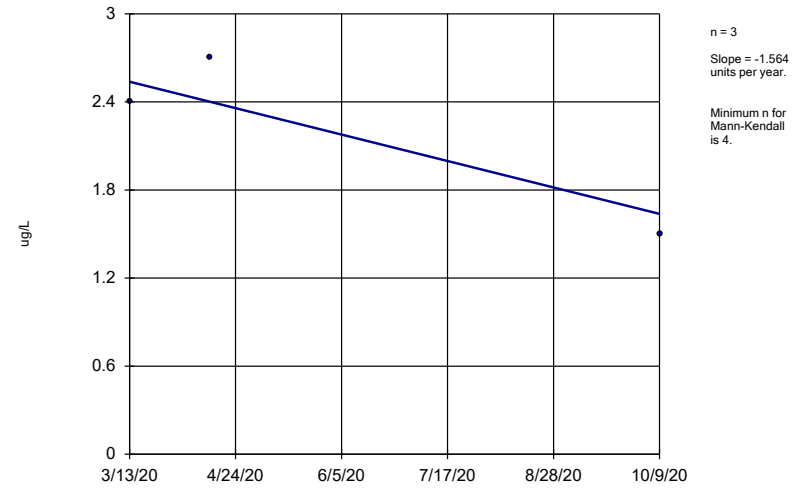
	MW-304
4/18/2018	0.39 (J)
8/15/2018	0.92 (J)
10/16/2018	0.45 (J)
4/8/2019	0.4 (J)
10/23/2019	0.5
4/13/2020	0.57
10/8/2020	0.41 (J)

### Cobalt MW-305



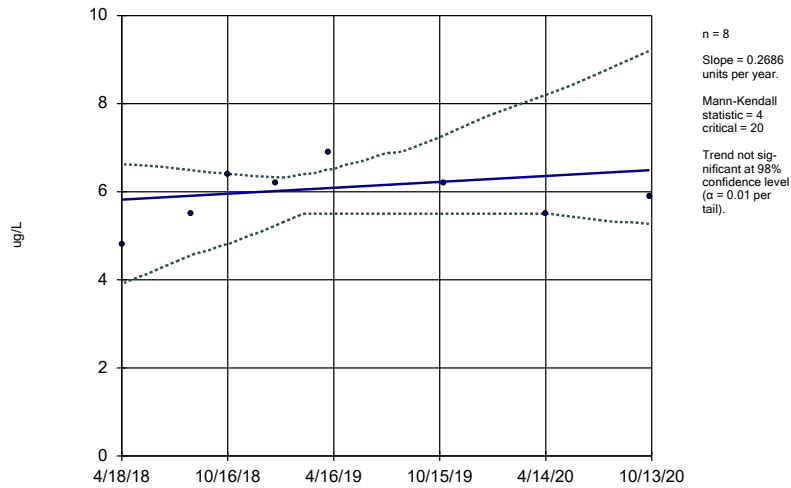
Sen's Slope and 95% Confidence Band Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

### Cobalt MW-305A



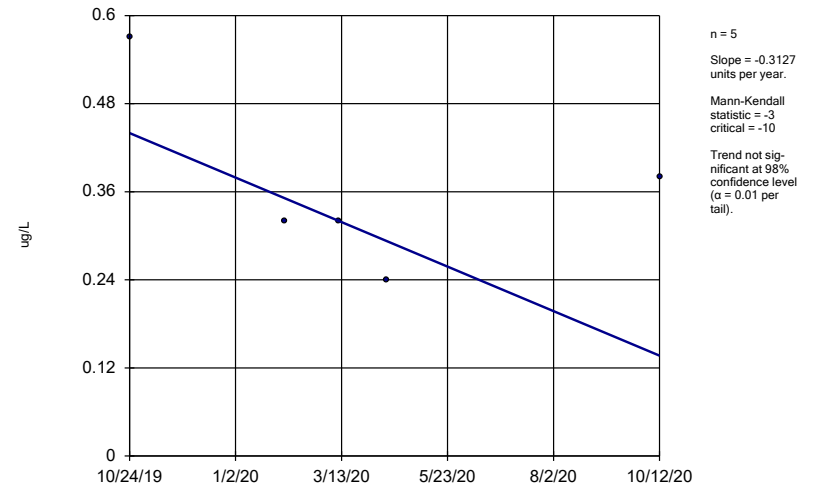
Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

### Cobalt MW-306



Sen's Slope and 95% Confidence Band Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

### Cobalt MW-310



Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-305
4/18/2018	14.5
8/15/2018	15.6
10/16/2018	17.2
1/8/2019	16.4
4/8/2019	17
10/23/2019	17
3/13/2020	18
4/13/2020	16
10/9/2020	17

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-305A
3/13/2020	2.4
4/14/2020	2.7
10/9/2020	1.5

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

MW-306

4/18/2018	4.8
8/15/2018	5.5
10/16/2018	6.4
1/8/2019	6.2
4/8/2019	6.9
10/23/2019	6.2
4/14/2020	5.5
10/9/2020	5.9

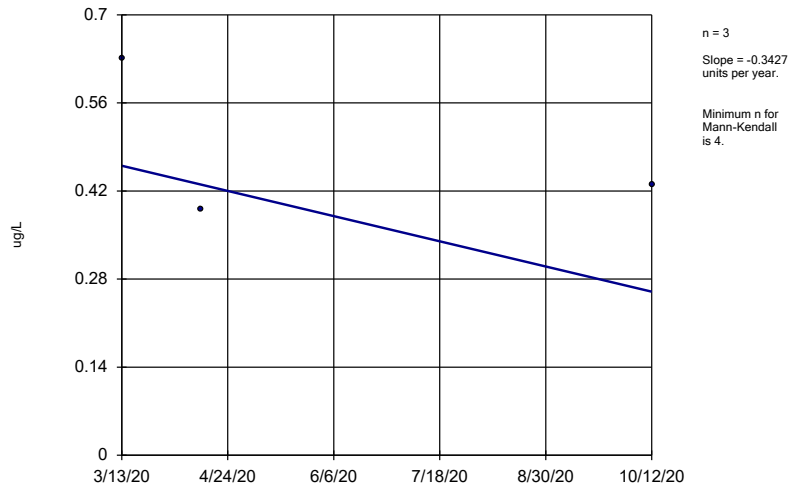


# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

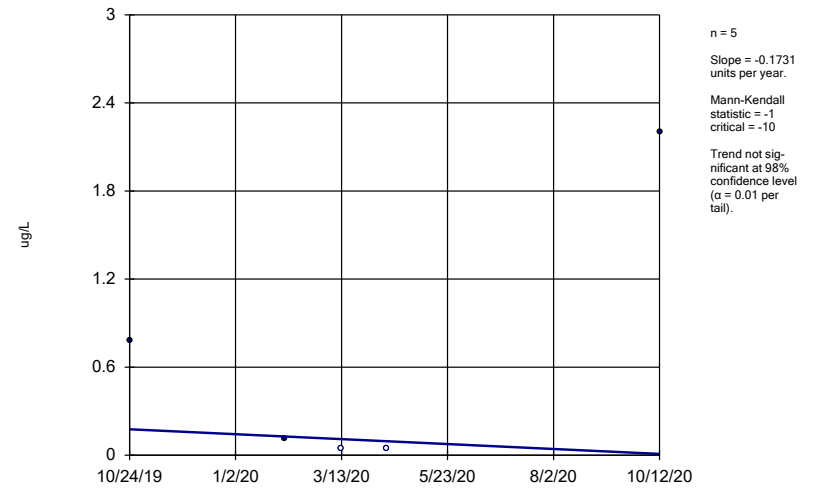
	MW-310
10/24/2019	0.57
2/5/2020	0.32 (J)
3/12/2020	0.32 (J)
4/13/2020	0.24 (J)
10/12/2020	0.38 (J)

### Cobalt MW-310A



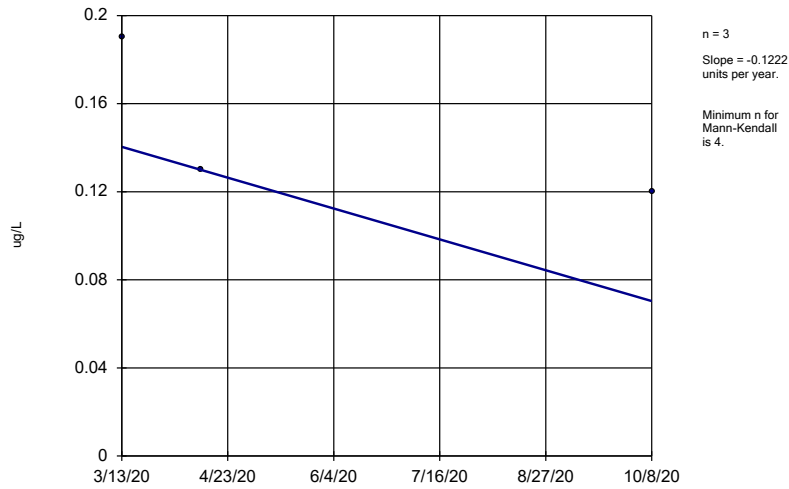
Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

### Cobalt MW-311



Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

### Cobalt MW-311A



Sen's Slope Estimator Analysis Run 1/7/2021 5:40 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-310A
3/13/2020	0.63
4/14/2020	0.39 (J)
10/12/2020	0.43 (J)

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-311
10/24/2019	0.78
2/5/2020	0.11 (J)
3/13/2020	<0.091 (U)
4/13/2020	<0.091 (U)
10/12/2020	2.2

# Sen's Slope Estimator

Constituent: Cobalt (ug/L) Analysis Run 1/7/2021 5:42 PM View: OGS - Ash Pond  
Ottumwa Generating Station Client: SCS Engineers Data: OGS\_CP\_Export\_201122

	MW-311A
3/13/2020	0.19 (J)
4/13/2020	0.13 (J)
10/8/2020	0.12 (J)