2018 Annual Groundwater Monitoring and Corrective Action Report

Ottumwa Generating Station
Ottumwa, Iowa

Prepared for:

Alliant Energy

SCS ENGINEERS

25216072.18 | January 31, 2019

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

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Appendix A – Analytical Laboratory Reports

I:\25216072.00\Deliverables\2018 Annual OGS GW Mon and CA Report\190131_Annual CCR GW Report OGS_Final.docx

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1.0 INTRODUCTION

This 2018 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 2018 Annual Groundwater Monitoring and Corrective Action Report for the CCR units.

This report covers the period of groundwater monitoring from January 1, 2018, through December 31, 2018.

The system is designed to detect monitored constituents at the waste boundary of the OGS Ash Pond (existing CCR surface impoundment) located at the Ottumwa Generating Station (OGS), as required by 40 CFR 257.91(d). The groundwater monitoring system consists of one upgradient and five downgradient monitoring wells.

2.0 § 257.90(E) ANNUAL REPORT REQUIREMENTS

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

2.1 §257.90(E)(1) SITE MAP

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

A map 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 1**. Other CCR units are also presented on **Figure 1**.

2.2 §257.90(E)(2) MONITORING SYSTEM CHANGES

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

No new monitoring wells were installed and no wells were decommissioned as part of the groundwater monitoring program for the CCR unit in 2018.

2.3 §257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Three groundwater sampling events were completed for the CCR units at OGS Ash Pond in 2018, with two resampling events. As described in **Section 2.4**, the site transitioned to an assessment monitoring program in 2018. The first round of assessment monitoring samples were collected in April 2018, and the second round was collected in August 2018. A resampling monitoring event occurred later in the month of August 2018, because the initial samples were received at the laboratory above an acceptable temperature. All of the CCR monitoring wells were sampled in October 2018 to continue the semiannual monitoring schedule established for the site. The laboratory inadvertently did not analyze the October 2018 samples for mercury. To complete the October event, samples were collected for mercury analysis in January 2019. All groundwater sampling and analysis was completed within the timeframe required for evaluation of the assessment monitoring results.

Groundwater samples collected in the April, August, and October 2018 sampling events were analyzed for both Appendix III and Appendix IV constituents. A summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs is included in **Table 1**. The results of the analytical laboratory analyses are provided in the laboratory reports in **Appendix A1** through **Appendix A5**.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

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

Detection monitoring for the OGS Ash Pond was initiated in November 2017. The statistical evaluation of the November 2017 detection monitoring results completed on January 15, 2018, identified statistically significant increases (SSIs) in detection monitoring constituents at the downgradient wells. SSIs were identified for boron, calcium, chloride, fluoride, field pH, sulfate, and total dissolved solids (TDS) at one or more wells based on the November 2017 detection monitoring event. Interstate Power and Light Company (IPL) collected the first round of assessment monitoring samples in April 2018 and established an assessment monitoring program on July 16, 2018, in accordance with §257.95(b).

2.5 § 257.90(E)(5) OTHER REQUIREMENTS

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

Additional potentially applicable requirements for the annual report, and the location of the requirement within the Rule, are provided in the following sections. For each cited section of the Rule, the portion referencing the annual report requirement is provided below in italics, followed by applicable information relative to the 2018 Annual Groundwater Monitoring and Corrective Action Report for the CCR unit.

2.5.1 § 257.90(e) General Requirements

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

Status of Groundwater Monitoring and Corrective Action Program. The groundwater monitoring and corrective action program is currently in assessment monitoring.

Summary of Key Actions Completed.

- Statistical evaluation and determination of SSIs for the November 2017 monitoring event, completed January 15, 2018.
- Alternative source evaluation for the SSIs identified for the November 2017 detection monitoring event, completed April 16, 2018.
- Establishment of assessment monitoring program, completed July 16, 2018.
- Establishment of Groundwater Protection Standards (GPSs) for all detected Appendix IV constituents, completed October 15, 2018.
- Two semiannual groundwater sampling and analysis events (April and October 2018) plus the additional groundwater sampling event in August 2018 as specified in § 257.95(d)(1).

Description of Any Problems Encountered.

- During the August 2018 groundwater monitoring event, the shipping company delivered a cooler of samples to the laboratory late and the TDS and anion samples within the cooler were outside of an acceptable temperature.
- During the October 2018 groundwater monitoring event, the laboratory inadvertently did not complete the analysis for mercury for the collected groundwater samples.

Discussion of Actions to Resolve the Problems.

- A groundwater resampling event for TDS and anions occurred in late August 2018 to collect groundwater samples for analysis that could not be completed in the August Assessment Round 2 monitoring event.
- A groundwater resampling event was completed in January 2019 to collect groundwater samples for mercury analysis that the laboratory missed in the October 2018 laboratory analysis.

Projection of Key Activities for the Upcoming Year (2019):

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April, August, and October 2018 monitoring events (by 1/14/19).

- Statistical evaluation and determination of any statistically significant levels exceeding the GPS for the April 2019 monitoring events (by 7/15/19).

- If one or more Appendix IV constituents is detected at a statistically significant level about the GPS, then within 30 days IPL will prepare a notification in accordance with §257.95(g) and within 90 days complete an alternative source demonstration or initiate an assessment of corrective measures (§257.95(g)(3)). IPL will also characterize the release (§257.95(g)(1)) and notify property owners (§257.95(g)(2)).

- Two semiannual groundwater sampling and analysis events (April and October 2019).

2.5.2 § 257.94(d) Alternative Detection Monitoring Frequency

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

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

2.5.3 § 257.94(e)(2) Alternative Source Demonstration for Detection Monitoring

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

Not applicable. No alternative source demonstration was completed in 2018.

2.5.4 § 257.95(c) Alternative Assessment Monitoring Frequency

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

Not applicable. Assessment monitoring has been initiated at the site but no alternative assessment monitoring frequency is proposed at this time.

2.5.5 § 257.95(d)(3) Assessment Monitoring Results and Standards

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

The recorded concentrations for the assessment monitoring events are in the laboratory reports in **Appendix A**. The background concentrations established under §257.94(b) were provided in Appendix A of the 2017 Annual Groundwater Monitoring and Corrective Action Report for OGS. The groundwater protection standards established for OGS are provided in **Table 2**.

2.5.6 § 257.95(g)(3)(ii) Alternative Source Demonstration for Assessment Monitoring

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

Not applicable. No alternative source demonstration evaluation for assessment monitoring was completed in 2018.

2.5.7 § 257.96(a) Extension of Time for Corrective Measures Assessment

The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measure due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

Not applicable. Corrective measures assessment has not been initiated.

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Tables

Table 1. CCR Rule Groundwater Samples Summary
Ottumwa Generating Station / SCS Engineers Project #25216072

Sample Dates	Downgradient Wells					Background Well
	MW-302	MW-303	MW-304	MW-305	MW-306	MW-301
4/18/2018	A	A	A	A	A	A
8/14-15/2018	A	A	A	A	A	A
8/29/2018	A-R	A-R	A-R	--	--	A-R
10/16/2018	A	A	A	A	A	A
1/8/2019*	A-R	A-R	A-R	A-R	A-R	A-R
Total Samples	5	5	5	4	4	5

Abbreviations:
A = Required by Assessment Monitoring Program
A-R = Resampling event under Assessment Monitoring Program
* = Resampling event completed in 2019 but analytical results will be used for evaluation for the October 2018 sampling event.

Created by:	NDK	Date:	1/4/2019
Last revision by:	NDK	Date:	1/9/2019
Checked by:	MDB	Date:	1/9/2019

I:\25216072.00\Deliverables\2018 Annual OGS GW Mon and CA Report\Tables\[Table 1_GW_Samples_Summary_Table_OGS.xlsx]GW Summary

Table 2. Groundwater Protection Standards - CCR Program - Assessment Monitoring
Ottumwa Generating Station Ash Pond / SCS Engineers Project #25216072.18

Parameter Name	GPS	Source
Antimony, ug/L	6	MCL
Arsenic, ug/L	10	MCL
Barium, ug/L	2000	MCL
Beryllium, ug/L	4	MCL
Cadmium, ug/L	5	MCL
Chromium, ug/L	100	MCL
Cobalt, ug/L	6	40 CFR 257.95(h)(2)
Fluoride, mg/L	4	MCL
Lead, ug/L	15	40 CFR 257.95(h)(2)
Lithium, ug/L	40	40 CFR 257.95(h)(2)
Mercury, ug/L	2	MCL
Molybdenum, ug/L	100	40 CFR 257.95(h)(2)
Selenium, ug/L	50	MCL
Thallium, ug/L	2	MCL
Radium 226/228 Combined, pCi/L	5	MCL

Abbreviations:
GPS = Groundwater Protection Standard
MCL = Maximum Contaminant Level established under 40 CFR 141.62 and 141.66

Created by: NDK, 1/8/2019
Checked by: MDB, 1/8/2019

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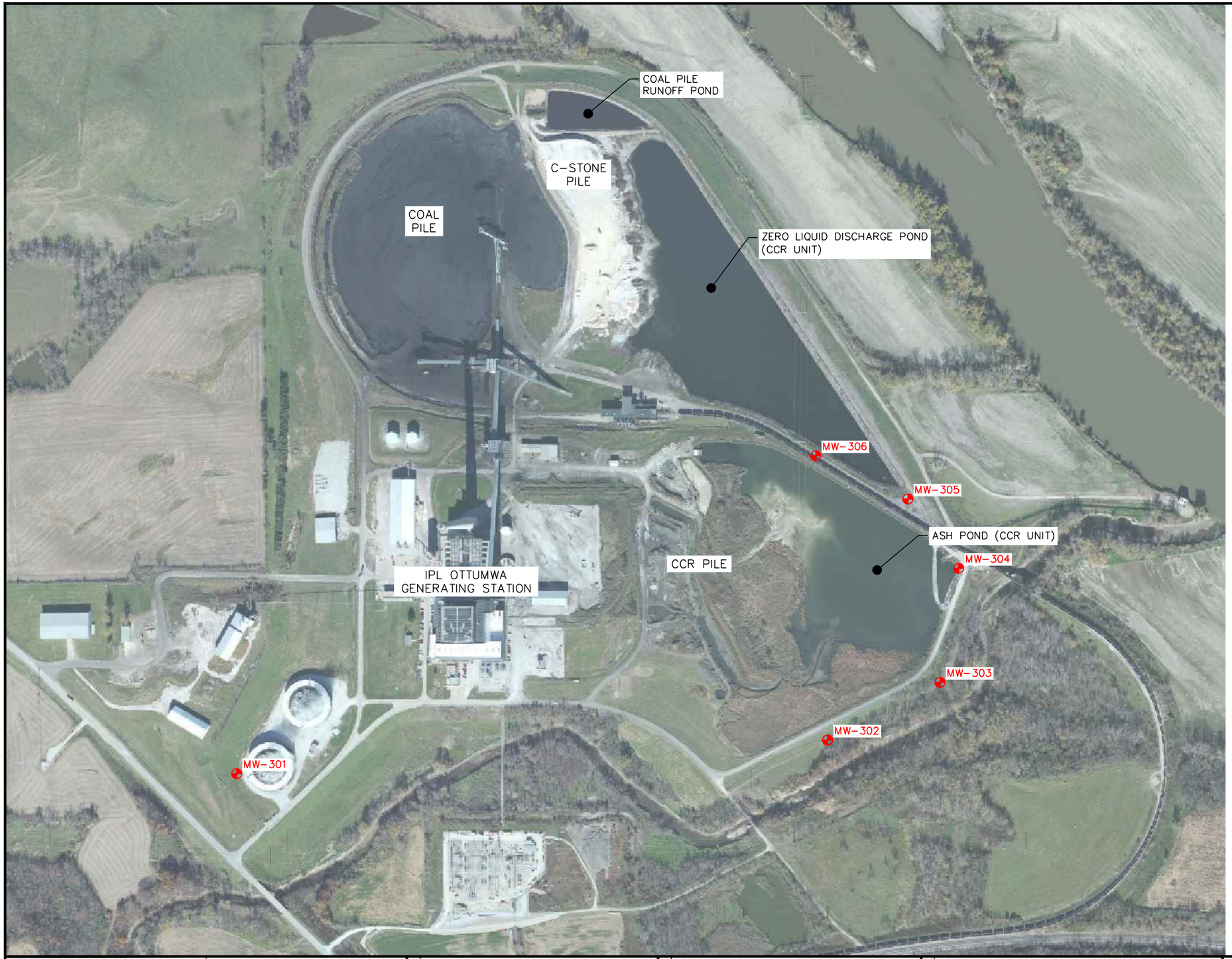
Figure 1

Site Plan and Monitoring Well Location Map



LEGEND

MW-301 CCR RULE MONITORING WELL

NOTES:

1. MONITORING WELLS MW-301, MW-302, MW-304, WERE INSTALLED BY CASCADE DRILLING, LLP. UNDER THE SUPERVISION OF SCS ENGINEERS FROM NOVEMBER 11-12, 2015.
2. MONITORING WELLS MW-303 AND MW-305 WERE INSTALLED BY CASCADE DRILLING LLP. UNDER THE SUPERVISION OF SCS ENGINEERS ON DECEMBER 7-8, 2015.
3. MONITORING WELLS MW-301, MW-302, MW-304 AND MW-306 WERE SURVEYED BY FRENCH RENEKER ASSOCIATES, INC. ON DECEMBER 3, 2015.
4. MONITORING WELLS MW-303 AND MW-305 WERE SURVEYED BY FRENCH-RENEKER ASSOCIATES, INC. ON FEBRUARY 11, 2016.

N

500 0 500

SCALE: 1" = 500'

PROJECT NO.	25216072.18	DRAWN BY:	AHB/BSS
DRAWN:	05/29/15	CHECKED BY:	NK
REVISED:	01/10/19	APPROVED BY:	

ENGINEER: SCS ENGINEERS
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: OTTUMWA GENERATING STATION
OTTUMWA, IOWA

MONITORING WELL LOCATION MAP

FIGURE 1

I:\25216072.00\Drawings\CCR 2018 Annual Rpt.dwg, 1/14/2019 8:21:17 AM

Appendix A

Laboratory Reports

A1 Assessment Monitoring Round 1, April 2018

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 06, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka for
Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

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CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
WY STR Certification #: 2456.01
Arkansas Certification #: 17-016-0
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60268626001	**MW-301**	Water	04/18/18 10:15	04/20/18 08:45
60268626002	**MW-302**	Water	04/18/18 11:10	04/20/18 08:45
60268626003	**MW-303**	Water	04/18/18 12:20	04/20/18 08:45
60268626004	**MW-304**	Water	04/18/18 13:40	04/20/18 08:45
60268626005	**MW-305**	Water	04/18/18 14:50	04/20/18 08:45
60268626006	**MW-306**	Water	04/18/18 16:10	04/20/18 08:45
60268626010	**FIELD BLANK**	Water	04/18/18 16:30	04/20/18 08:45

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60268626001	**MW-301**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626002	**MW-302**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626003	**MW-303**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626004	**MW-304**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626005	**MW-305**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626006	**MW-306**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	AGO	3	PASI-K
60268626010	**FIELD BLANK**	EPA 6010	TDS	3	PASI-K

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020	JGP	11	PASI-K
		EPA 7470	CRN	1	PASI-K
		SM 2540C	OL	1	PASI-K
		EPA 9040	MJK	1	PASI-K
		EPA 9056	LDB	3	PASI-K

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-301 **Lab ID: 60268626001** Collected: 04/18/18 10:15 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 10:15		
Field pH	**6.41**	Std. Units	0.10	0.050	1		04/18/18 10:15		
Field Temperature	**7.2**	deg C	0.50	0.25	1		04/18/18 10:15		
Field Specific Conductance	**770**	umhos/cm	1.0	1.0	1		04/18/18 10:15		
Field Oxidation Potential	**105.5**	mV			1		04/18/18 10:15		
Oxygen, Dissolved	**6.52**	mg/L			1		04/18/18 10:15	7782-44-7	
Turbidity	**0.66**	NTU	1.0	1.0	1		04/18/18 10:15		
Groundwater Elevation	**681.53**	feet			1		04/18/18 10:15		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**480**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:45	7440-42-8	
Calcium	**63.0**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:45	7440-70-2	
Lithium	**19.1**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:45	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:07	7440-36-0	
Arsenic	**0.074J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:07	7440-38-2	
Barium	**31.6**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:07	7440-39-3	
Beryllium	**<0.012**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 12:53	7440-41-7	
Cadmium	**0.023J**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:07	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:07	7440-47-3	
Cobalt	**0.46J**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:07	7440-48-4	
Lead	**0.041J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:07	7439-92-1	
Molybdenum	**0.67J**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 12:53	7439-98-7	B
Selenium	**4.3**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:07	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:07	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:48	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**514**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**6.6**	Std. Units	0.10	0.10	1		04/24/18 14:37		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**63.4**	mg/L	5.0	2.3	5		04/25/18 23:53	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		04/26/18 00:07	16984-48-8	
Sulfate	**186**	mg/L	20.0	4.7	20		04/26/18 20:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-302 **Lab ID: 60268626002** Collected: 04/18/18 11:10 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 11:10		
Field pH	**6.47**	Std. Units	0.10	0.050	1		04/18/18 11:10		
Field Temperature	**10.7**	deg C	0.50	0.25	1		04/18/18 11:10		
Field Specific Conductance	**2248**	umhos/cm	1.0	1.0	1		04/18/18 11:10		
Field Oxidation Potential	**82.6**	mV			1		04/18/18 11:10		
Oxygen, Dissolved	**0.2**	mg/L			1		04/18/18 11:10	7782-44-7	
Turbidity	**2.41**	NTU	1.0	1.0	1		04/18/18 11:10		
Groundwater Elevation	**655.71**	feet			1		04/18/18 11:10		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**1200**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:47	7440-42-8	
Calcium	**177**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:47	7440-70-2	
Lithium	**7.5J**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:47	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:11	7440-36-0	
Arsenic	**0.16J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:11	7440-38-2	
Barium	**17.7**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:11	7440-39-3	
Beryllium	**<0.012**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 12:57	7440-41-7	
Cadmium	**0.22J**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:11	7440-43-9	
Chromium	**0.46J**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:11	7440-47-3	
Cobalt	**0.90J**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:11	7440-48-4	
Lead	**0.098J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:11	7439-92-1	
Molybdenum	**0.59J**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 12:57	7439-98-7	B
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:11	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:11	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470	Preparation Method: EPA 7470							
Mercury	**0.096J**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:50	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1690**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**6.7**	Std. Units	0.10	0.10	1		04/24/18 14:39		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**246**	mg/L	50.0	23.1	50		04/26/18 00:48	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.063	1		04/26/18 00:20	16984-48-8	
Sulfate	**899**	mg/L	50.0	11.8	50		04/26/18 00:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-303 **Lab ID: 60268626003** Collected: 04/18/18 12:20 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 12:20		
Field pH	**6.63**	Std. Units	0.10	0.050	1		04/18/18 12:20		
Field Temperature	**8.2**	deg C	0.50	0.25	1		04/18/18 12:20		
Field Specific Conductance	**1862**	umhos/cm	1.0	1.0	1		04/18/18 12:20		
Field Oxidation Potential	**3.2**	mV			1		04/18/18 12:20		
Oxygen, Dissolved	**0.17**	mg/L			1		04/18/18 12:20	7782-44-7	
Turbidity	**3.69**	NTU	1.0	1.0	1		04/18/18 12:20		
Groundwater Elevation	**652.47**	feet			1		04/18/18 12:20		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**987**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:49	7440-42-8	
Calcium	**212**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:49	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:49	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.098J**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:15	7440-36-0	
Arsenic	**0.43J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:15	7440-38-2	
Barium	**69.5**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:15	7440-39-3	
Beryllium	**0.017J**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 15:41	7440-41-7	
Cadmium	**0.44J**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:15	7440-43-9	
Chromium	**0.12J**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:15	7440-47-3	
Cobalt	**2.1**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:15	7440-48-4	
Lead	**0.069J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:15	7439-92-1	
Molybdenum	**0.61J**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 13:23	7439-98-7	B
Selenium	**0.23J**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:15	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:15	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:52	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1300**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		04/24/18 14:41		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**198**	mg/L	50.0	23.1	50		04/26/18 01:29	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.063	1		04/26/18 01:01	16984-48-8	
Sulfate	**328**	mg/L	50.0	11.8	50		04/26/18 01:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-304 **Lab ID: 60268626004** Collected: 04/18/18 13:40 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 13:40		
Field pH	**6.9**	Std. Units	0.10	0.050	1		04/18/18 13:40		
Field Temperature	**12.8**	deg C	0.50	0.25	1		04/18/18 13:40		
Field Specific Conductance	**2141**	umhos/cm	1.0	1.0	1		04/18/18 13:40		
Field Oxidation Potential	**137.5**	mV			1		04/18/18 13:40		
Oxygen, Dissolved	**0.15**	mg/L			1		04/18/18 13:40	7782-44-7	
Turbidity	**39.29**	NTU	1.0	1.0	1		04/18/18 13:40		
Groundwater Elevation	**655.55**	feet			1		04/18/18 13:40		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**991**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:52	7440-42-8	
Calcium	**131**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:52	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:52	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:20	7440-36-0	
Arsenic	**0.68J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:20	7440-38-2	
Barium	**88.5**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:20	7440-39-3	
Beryllium	**0.026J**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 15:43	7440-41-7	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:20	7440-43-9	
Chromium	**2.0**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:20	7440-47-3	
Cobalt	**0.39J**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:20	7440-48-4	
Lead	**0.37J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:20	7439-92-1	
Molybdenum	**2.0**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 13:27	7439-98-7	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:20	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1300**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**7.0**	Std. Units	0.10	0.10	1		04/24/18 14:44		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**400**	mg/L	25.0	11.5	25		04/26/18 02:37	16887-00-6	
Fluoride	**0.92**	mg/L	0.20	0.063	1		04/26/18 01:43	16984-48-8	
Sulfate	**198**	mg/L	10.0	2.4	10		04/26/18 01:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-305 **Lab ID: 60268626005** Collected: 04/18/18 14:50 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 14:50		
Field pH	**6.9**	Std. Units	0.10	0.050	1		04/18/18 14:50		
Field Temperature	**12.8**	deg C	0.50	0.25	1		04/18/18 14:50		
Field Specific Conductance	**1840**	umhos/cm	1.0	1.0	1		04/18/18 14:50		
Field Oxidation Potential	**-32.7**	mV			1		04/18/18 14:50		
Oxygen, Dissolved	**0.15**	mg/L			1		04/18/18 14:50	7782-44-7	
Turbidity	**7.37**	NTU	1.0	1.0	1		04/18/18 14:50		
Groundwater Elevation	**660.99**	feet			1		04/18/18 14:50		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**886**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 20:58	7440-42-8	
Calcium	**97.6**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 20:58	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 20:58	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.089J**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:37	7440-36-0	
Arsenic	**0.51J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:37	7440-38-2	
Barium	**116**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:37	7440-39-3	
Beryllium	**<0.012**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 15:46	7440-41-7	
Cadmium	**0.054J**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:37	7440-43-9	
Chromium	**0.26J**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:37	7440-47-3	
Cobalt	**14.5**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:37	7440-48-4	
Lead	**0.12J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:37	7439-92-1	
Molybdenum	**7.1**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 13:30	7439-98-7	
Selenium	**0.12J**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:37	7782-49-2	
Thallium	**0.32J**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:37	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:57	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1070**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**7.3**	Std. Units	0.10	0.10	1		05/01/18 16:55		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**289**	mg/L	25.0	11.5	25		04/26/18 21:44	16887-00-6	
Fluoride	**0.40**	mg/L	0.20	0.063	1		04/26/18 02:51	16984-48-8	
Sulfate	**147**	mg/L	10.0	2.4	10		04/26/18 03:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: MW-306 **Lab ID: 60268626006** Collected: 04/18/18 16:10 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**CLIENT**				1		04/18/18 16:10		
Field pH	**6.42**	Std. Units	0.10	0.050	1		04/18/18 16:10		
Field Temperature	**13.1**	deg C	0.50	0.25	1		04/18/18 16:10		
Field Specific Conductance	**1228**	umhos/cm	1.0	1.0	1		04/18/18 16:10		
Field Oxidation Potential	**14.2**	mV			1		04/18/18 16:10		
Oxygen, Dissolved	**0.14**	mg/L			1		04/18/18 16:10	7782-44-7	
Turbidity	**0.59**	NTU	1.0	1.0	1		04/18/18 16:10		
Groundwater Elevation	**668.92**	feet			1		04/18/18 16:10		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**919**	ug/L	100	12.5	1	04/25/18 17:19	04/26/18 21:00	7440-42-8	
Calcium	**74.1**	mg/L	0.20	0.054	1	04/25/18 17:19	04/26/18 21:00	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/25/18 17:19	04/26/18 21:00	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.094J**	ug/L	1.0	0.026	1	04/25/18 17:19	05/01/18 22:41	7440-36-0	
Arsenic	**0.38J**	ug/L	1.0	0.052	1	04/25/18 17:19	05/01/18 22:41	7440-38-2	
Barium	**48.2**	ug/L	1.0	0.095	1	04/25/18 17:19	05/01/18 22:41	7440-39-3	
Beryllium	**<0.012**	ug/L	0.50	0.012	1	04/25/18 17:19	05/09/18 13:34	7440-41-7	
Cadmium	**0.88**	ug/L	0.50	0.018	1	04/25/18 17:19	05/01/18 22:41	7440-43-9	
Chromium	**0.37J**	ug/L	1.0	0.054	1	04/25/18 17:19	05/01/18 22:41	7440-47-3	
Cobalt	**4.8**	ug/L	1.0	0.014	1	04/25/18 17:19	05/01/18 22:41	7440-48-4	
Lead	**0.040J**	ug/L	1.0	0.033	1	04/25/18 17:19	05/01/18 22:41	7439-92-1	
Molybdenum	**5.7**	ug/L	1.0	0.058	1	04/25/18 17:19	05/09/18 13:34	7439-98-7	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/25/18 17:19	05/01/18 22:41	7782-49-2	
Thallium	**0.083J**	ug/L	1.0	0.036	1	04/25/18 17:19	05/01/18 22:41	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 09:59	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**805**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		05/01/18 16:58		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**54.4**	mg/L	5.0	2.3	5		04/26/18 04:00	16887-00-6	
Fluoride	**0.11J**	mg/L	0.20	0.063	1		04/26/18 03:19	16984-48-8	
Sulfate	**289**	mg/L	20.0	4.7	20		04/26/18 04:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Sample: FIELD BLANK **Lab ID: 60268626010** Collected: 04/18/18 16:30 Received: 04/20/18 08:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**<12.5**	ug/L	100	12.5	1	04/26/18 17:10	04/30/18 19:30	7440-42-8	
Calcium	**<0.054**	mg/L	0.20	0.054	1	04/26/18 17:10	04/30/18 19:30	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/26/18 17:10	04/30/18 19:30	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/26/18 17:10	05/01/18 23:45	7440-36-0	
Arsenic	**<0.052**	ug/L	1.0	0.052	1	04/26/18 17:10	05/01/18 23:45	7440-38-2	
Barium	**0.64J**	ug/L	1.0	0.095	1	04/26/18 17:10	05/01/18 23:45	7440-39-3	B
Beryllium	**<0.012**	ug/L	0.50	0.012	1	04/26/18 17:10	05/09/18 14:23	7440-41-7	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/26/18 17:10	05/01/18 23:45	7440-43-9	
Chromium	**0.53J**	ug/L	1.0	0.054	1	04/26/18 17:10	05/09/18 14:23	7440-47-3	
Cobalt	**<0.014**	ug/L	1.0	0.014	1	04/26/18 17:10	05/01/18 23:45	7440-48-4	
Lead	**<0.033**	ug/L	1.0	0.033	1	04/26/18 17:10	05/01/18 23:45	7439-92-1	
Molybdenum	**<0.058**	ug/L	1.0	0.058	1	04/26/18 17:10	05/09/18 14:23	7439-98-7	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/26/18 17:10	05/01/18 23:45	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/26/18 17:10	05/01/18 23:45	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/24/18 14:05	04/25/18 10:01	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		04/25/18 12:50		
9040 pH	Analytical Method: EPA 9040								
pH	**6.7**	Std. Units	0.10	0.10	1		05/01/18 17:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**<0.46**	mg/L	1.0	0.46	1		04/28/18 13:51	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/28/18 13:51	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		04/28/18 13:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523027 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006, 60268626010

METHOD BLANK: 2141129 Matrix: Water
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006, 60268626010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/25/18 12:34	

LABORATORY CONTROL SAMPLE: 2141130

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.5	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141131 2141132

Parameter	Units	60268637001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.31	5	5	4.5	4.6	84	86	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523243 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

METHOD BLANK: 2141937 Matrix: Water
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	04/26/18 20:06	
Calcium	mg/L	<0.054	0.20	0.054	04/26/18 20:06	
Lithium	ug/L	<4.6	10.0	4.6	04/26/18 20:06	

LABORATORY CONTROL SAMPLE: 2141938

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	948	95	80-120	
Calcium	mg/L	10	9.7	97	80-120	
Lithium	ug/L	1000	1060	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141939 2141940

Parameter	Units	60268544002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	236	1000	1000	1140	1170	91	93	75-125	2	20	
Calcium	mg/L	170	10	10	176	178	64	80	75-125	1	20	M1
Lithium	ug/L	<4.6	1000	1000	1070	1080	107	108	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523410
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Associated Lab Samples: 60268626010

METHOD BLANK: 2142788 Matrix: Water
Associated Lab Samples: 60268626010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	04/30/18 19:16	
Calcium	mg/L	<0.054	0.20	0.054	04/30/18 19:16	
Lithium	ug/L	<4.6	10.0	4.6	04/30/18 19:16	

LABORATORY CONTROL SAMPLE: 2142789

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	982	98	80-120	
Calcium	mg/L	10	10.4	104	80-120	
Lithium	ug/L	1000	1000	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142790 2142791

Parameter	Units	60268626009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1340	1000	1000	2380	2340	104	100	75-125	2	20	
Calcium	mg/L	150	10	10	170	168	204	176	75-125	2	20	M1
Lithium	ug/L	8.0J	1000	1000	1050	1040	104	103	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523241 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

METHOD BLANK: 2141931 Matrix: Water
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	05/01/18 20:50	
Arsenic	ug/L	<0.052	1.0	0.052	05/01/18 20:50	
Barium	ug/L	<0.095	1.0	0.095	05/01/18 20:50	
Beryllium	ug/L	<0.012	0.50	0.012	05/09/18 12:23	
Cadmium	ug/L	<0.018	0.50	0.018	05/01/18 20:50	
Chromium	ug/L	<0.054	1.0	0.054	05/01/18 20:50	
Cobalt	ug/L	<0.014	1.0	0.014	05/01/18 20:50	
Lead	ug/L	<0.033	1.0	0.033	05/01/18 20:50	
Molybdenum	ug/L	0.085J	1.0	0.058	05/09/18 12:23	
Selenium	ug/L	<0.086	1.0	0.086	05/01/18 20:50	
Thallium	ug/L	<0.036	1.0	0.036	05/01/18 20:50	

LABORATORY CONTROL SAMPLE: 2141932

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.8	94	80-120	
Arsenic	ug/L	40	37.4	93	80-120	
Barium	ug/L	40	38.8	97	80-120	
Beryllium	ug/L	40	41.9	105	80-120	
Cadmium	ug/L	40	39.8	100	80-120	
Chromium	ug/L	40	37.8	95	80-120	
Cobalt	ug/L	40	37.5	94	80-120	
Lead	ug/L	40	40.6	101	80-120	
Molybdenum	ug/L	40	43.1	108	80-120	
Selenium	ug/L	40	36.6	91	80-120	
Thallium	ug/L	40	39.5	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141933 2141934

Parameter	Units	60268544001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.026	80	80	74.4	73.5	93	92	75-125	1	20	
Arsenic	ug/L	0.19J	80	80	74.6	73.1	93	91	75-125	2	20	
Barium	ug/L	44.9	80	80	117	117	90	91	75-125	0	20	
Beryllium	ug/L	<0.012	80	80	80.4	79.2	100	99	75-125	1	20	
Cadmium	ug/L	<0.018	80	80	76.2	75.5	95	94	75-125	1	20	
Chromium	ug/L	0.76J	80	80	76.2	74.2	94	92	75-125	3	20	
Cobalt	ug/L	<0.014	80	80	72.6	70.9	91	89	75-125	2	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141933 2141934

Parameter	Units	60268544001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	<0.033	80	80	83.0	77.0	104	96	75-125	7	20	
Molybdenum	ug/L	0.35J	80	80	87.2	85.8	109	107	75-125	2	20	
Selenium	ug/L	0.24J	80	80	70.0	70.6	87	88	75-125	1	20	
Thallium	ug/L	<0.036	80	80	77.0	76.2	96	95	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523411
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Associated Lab Samples: 60268626010

METHOD BLANK: 2142792
Matrix: Water
Associated Lab Samples: 60268626010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	05/01/18 23:11	
Arsenic	ug/L	<0.052	1.0	0.052	05/01/18 23:11	
Barium	ug/L	2.4	1.0	0.095	05/01/18 23:11	
Beryllium	ug/L	<0.012	0.50	0.012	05/09/18 14:01	
Cadmium	ug/L	0.035J	0.50	0.018	05/01/18 23:11	
Chromium	ug/L	<0.054	1.0	0.054	05/09/18 14:01	
Cobalt	ug/L	<0.014	1.0	0.014	05/01/18 23:11	
Lead	ug/L	0.070J	1.0	0.033	05/01/18 23:11	
Molybdenum	ug/L	<0.058	1.0	0.058	05/09/18 14:01	
Selenium	ug/L	<0.086	1.0	0.086	05/01/18 23:11	
Thallium	ug/L	<0.036	1.0	0.036	05/01/18 23:11	

LABORATORY CONTROL SAMPLE: 2142793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.8	95	80-120	
Arsenic	ug/L	40	36.9	92	80-120	
Barium	ug/L	40	38.5	96	80-120	
Beryllium	ug/L	40	42.4	106	80-120	
Cadmium	ug/L	40	39.1	98	80-120	
Chromium	ug/L	40	42.4	106	80-120	
Cobalt	ug/L	40	36.7	92	80-120	
Lead	ug/L	40	37.4	94	80-120	
Molybdenum	ug/L	40	42.5	106	80-120	
Selenium	ug/L	40	36.6	92	80-120	
Thallium	ug/L	40	36.1	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142794 2142795

Parameter	Units	60268626008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.026	40	40	35.7	35.4	89	88	75-125	1	20	
Arsenic	ug/L	0.29J	40	40	36.1	35.6	90	88	75-125	2	20	
Barium	ug/L	123	40	40	164	161	103	95	75-125	2	20	
Beryllium	ug/L	<0.012	40	40	38.7	38.7	97	97	75-125	0	20	
Cadmium	ug/L	<0.018	40	40	36.0	35.7	90	89	75-125	1	20	
Chromium	ug/L	0.17J	40	40	40.1	40.3	100	100	75-125	1	20	
Cobalt	ug/L	0.18J	40	40	33.6	32.4	83	81	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142794 2142795

Parameter	Units	60268626008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.043J	40	40	37.2	33.9	93	85	75-125	9	20	
Molybdenum	ug/L	0.60J	40	40	44.3	43.3	109	107	75-125	2	20	
Selenium	ug/L	<0.086	40	40	34.1	33.6	85	84	75-125	1	20	
Thallium	ug/L	<0.036	40	40	36.7	33.4	92	83	75-125	9	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523085 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006, 60268626010

METHOD BLANK: 2141358 Matrix: Water
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006, 60268626010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/25/18 12:50	

LABORATORY CONTROL SAMPLE: 2141359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 2141360

Parameter	Units	60268626001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	514	509	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 522990 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004

SAMPLE DUPLICATE: 2140945

Parameter	Units	60268289002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	13.4	13.4	0	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 524035 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60268626005, 60268626006, 60268626010

SAMPLE DUPLICATE: 2145257

Parameter	Units	60268626005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.3	7.4	1	10	H6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523195 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

METHOD BLANK: 2141792 Matrix: Water
Associated Lab Samples: 60268626001, 60268626002, 60268626003, 60268626004, 60268626005, 60268626006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/25/18 15:00	
Fluoride	mg/L	<0.063	0.20	0.063	04/25/18 15:00	
Sulfate	mg/L	<0.24	1.0	0.24	04/25/18 15:00	

LABORATORY CONTROL SAMPLE: 2141793

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2141795 2141796

Parameter	Units	60268626006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	54.4	25	25	82.8	82.7	114	113	80-120	0	15	
Fluoride	mg/L	0.11J	2.5	2.5	2.7	2.7	102	104	80-120	1	15	
Sulfate	mg/L	289	100	100	401	403	112	114	80-120	0	15	E

SAMPLE DUPLICATE: 2141794

Parameter	Units	60268544001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6.7	6.7	0	15	
Fluoride	mg/L	0.11J	0.12J		15	
Sulfate	mg/L	26.4	25.6	3	15	

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523380 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60268626001, 60268626005

METHOD BLANK: 2142687 Matrix: Water
Associated Lab Samples: 60268626001, 60268626005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/26/18 17:00	
Sulfate	mg/L	<0.24	1.0	0.24	04/26/18 17:00	

LABORATORY CONTROL SAMPLE: 2142688

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	
Sulfate	mg/L	5	5.3	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2142690 2142691

Parameter	Units	60268626001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	186	100	100	284	286	98	100	80-120	1	15	

SAMPLE DUPLICATE: 2142689

Parameter	Units	7585571003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	267	326	20	15	D6

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QUALITY CONTROL DATA

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

QC Batch: 523619 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60268626010

METHOD BLANK: 2143926 Matrix: Water
Associated Lab Samples: 60268626010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/28/18 09:52	
Fluoride	mg/L	<0.063	0.20	0.063	04/28/18 09:52	
Sulfate	mg/L	<0.24	1.0	0.24	04/28/18 09:52	

LABORATORY CONTROL SAMPLE: 2143927

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.4	98	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2143928 2143929

Parameter	Units	60268626007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.11J	2.5	2.5	2.8	2.9	106	110	80-120	3	15	
Sulfate	mg/L	103	50	50	155	154	102	101	80-120	1	15	

SAMPLE DUPLICATE: 2143930

Parameter	Units	60268626008 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	153	149	3	15	
Fluoride	mg/L	0.10J	0.11J		15	
Sulfate	mg/L	305	296	3	15	

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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

WORKORDER QUALIFIERS

WO: 60268626

[1]	Rev. 1 7/6/2018
[2]	Samples MW-307, MW-308, MW-309 have been omitted at the request of client

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60268626001	MW-301		524165		
60268626002	MW-302		524165		
60268626003	MW-303		524165		
60268626004	MW-304		524165		
60268626005	MW-305		524165		
60268626006	MW-306		524165		
60268626001	MW-301	EPA 3010	523243	EPA 6010	523279
60268626002	MW-302	EPA 3010	523243	EPA 6010	523279
60268626003	MW-303	EPA 3010	523243	EPA 6010	523279
60268626004	MW-304	EPA 3010	523243	EPA 6010	523279
60268626005	MW-305	EPA 3010	523243	EPA 6010	523279
60268626006	MW-306	EPA 3010	523243	EPA 6010	523279
60268626010	FIELD BLANK	EPA 3010	523410	EPA 6010	523461
60268626001	MW-301	EPA 3010	523241	EPA 6020	523278
60268626002	MW-302	EPA 3010	523241	EPA 6020	523278
60268626003	MW-303	EPA 3010	523241	EPA 6020	523278
60268626004	MW-304	EPA 3010	523241	EPA 6020	523278
60268626005	MW-305	EPA 3010	523241	EPA 6020	523278
60268626006	MW-306	EPA 3010	523241	EPA 6020	523278
60268626010	FIELD BLANK	EPA 3010	523411	EPA 6020	523463
60268626001	MW-301	EPA 7470	523027	EPA 7470	523058
60268626002	MW-302	EPA 7470	523027	EPA 7470	523058
60268626003	MW-303	EPA 7470	523027	EPA 7470	523058
60268626004	MW-304	EPA 7470	523027	EPA 7470	523058
60268626005	MW-305	EPA 7470	523027	EPA 7470	523058
60268626006	MW-306	EPA 7470	523027	EPA 7470	523058
60268626010	FIELD BLANK	EPA 7470	523027	EPA 7470	523058
60268626001	MW-301	SM 2540C	523085		
60268626002	MW-302	SM 2540C	523085		
60268626003	MW-303	SM 2540C	523085		
60268626004	MW-304	SM 2540C	523085		
60268626005	MW-305	SM 2540C	523085		
60268626006	MW-306	SM 2540C	523085		
60268626010	FIELD BLANK	SM 2540C	523085		
60268626001	MW-301	EPA 9040	522990		
60268626002	MW-302	EPA 9040	522990		
60268626003	MW-303	EPA 9040	522990		
60268626004	MW-304	EPA 9040	522990		
60268626005	MW-305	EPA 9040	524035		
60268626006	MW-306	EPA 9040	524035		
60268626010	FIELD BLANK	EPA 9040	524035		
60268626001	MW-301	EPA 9056	523195		
60268626001	MW-301	EPA 9056	523380		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268626

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60268626002	**MW-302**	EPA 9056	523195		
60268626003	**MW-303**	EPA 9056	523195		
60268626004	**MW-304**	EPA 9056	523195		
60268626005	**MW-305**	EPA 9056	523195		
60268626005	**MW-305**	EPA 9056	523380		
60268626006	**MW-306**	EPA 9056	523195		
60268626010	**FIELD BLANK**	EPA 9056	523619		

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Sample Condition Upon Receipt

WO# : 60268626

60268626

Client Name: SCS ENGINEERS

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 4122 4945 7067 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ ZPLC

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.9 **Corr. Factor** +1.1 **Corrected** 4.0

Date and initials of person examining contents: JDE 4-20-18

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No ☐N/A	RECEIVED 2 BPSN CO SAMPLES FOR MW301
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	MW306, COC SHOWS ONLY 1
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / (N) Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: JML Date: 4-23-18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS Engineers	Report To:	Meghan Blodgett	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Generating Station	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216072.18	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: IA

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	~~6010 Total Metals: B-Ca~~ 6010				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60216072.6
	Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS																N	N	N				N					
1	MW-301	WT	G	xxx	xxx	4-18-18	10:15	7.3	2	1		1					X	X	X	X	X	X	X	BP2U, BP3N(2)				001
2	MW-302	WT	G	xxx	xxx		11:10	10.7	2	1		1					X	X	X	X	X	X	X					002
3	MW-303	WT	G	xxx	xxx		12:20	8.2	2	1		1					X	X	X	X	X	X	X					003
4	MW-304	WT	G	xxx	xxx		13:40	12.9	2	1		1					X	X	X	X	X	X	X					004
5	MW-305	WT	G	xxx	xxx		14:50	12.8	2	1		1					X	X	X	X	X	X	X					005
6	MW-306	WT	G	xxx	xxx		16:10	13.1	2	1		1					X	X	X	X	X	X	X					006
7	MW-307	WT	G	xxx	xxx	4-16-18	20:55	11.6	3	1		2					X	X	X	X	X	X						007
8	MW-308	WT	G	xxx	xxx	4-16-18	17:40	11.9	3	1		2					X	X	X	X	X	X						008
9	MW-309	WT	G	xxx	xxx	4-16-18	19:55	11.2	3	1		2					X	X	X	X	X	X						009
10	FIELD BLANK	WT	G	xxx	xxx	4-18-18	16:30	—	3	1		2					X	X	X	X	X	X					—	010
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Lyons	4-19-18	9:00	PACE	4-20-18	0845	4.0	Y	Y	X
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

Pace Analytical Services, LLC
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July 06, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on April 20, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Trudy Gipson

Trudy Gipson
trudy.gipson@pacelabs.com
1(913)563-1405
Project Manager

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

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CERTIFICATIONS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60268653001	**MW-301**	Water	04/18/18 10:15	04/20/18 08:45
60268653002	**MW-302**	Water	04/18/18 11:10	04/20/18 08:45
60268653003	**MW-303**	Water	04/18/18 12:20	04/20/18 08:45
60268653004	**MW-304**	Water	04/18/18 13:40	04/20/18 08:45
60268653005	**MW-305**	Water	04/18/18 14:50	04/20/18 08:45
60268653006	**MW-306**	Water	04/18/18 16:10	04/20/18 08:45
60268653010	**FIELD BLANK**	Water	04/18/18 16:30	04/20/18 08:45

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60268653001	**MW-301**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653002	**MW-302**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653003	**MW-303**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653004	**MW-304**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653005	**MW-305**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653006	**MW-306**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60268653010	**FIELD BLANK**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-301 **Lab ID: 60268653001** Collected: 04/18/18 10:15 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.145 ± 0.348 (0.672) C:NA T:90%**	pCi/L	05/09/18 20:47	13982-63-3	
Radium-228	EPA 904.0	**0.368 ± 0.464 (0.989) C:80% T:83%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.513 ± 0.812 (1.66)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-302 **Lab ID: 60268653002** Collected: 04/18/18 11:10 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.251 ± 0.383 (0.227) C:NA T:76%**	pCi/L	05/09/18 20:47	13982-63-3	
Radium-228	EPA 904.0	**0.495 ± 0.463 (0.959) C:79% T:89%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.746 ± 0.846 (1.19)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-303 **Lab ID: 60268653003** Collected: 04/18/18 12:20 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.088 ± 0.456 (1.06) C:NA T:74%**	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	**0.529 ± 0.391 (0.772) C:78% T:92%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.529 ± 0.847 (1.83)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-304 **Lab ID: 60268653004** Collected: 04/18/18 13:40 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.22 ± 0.715 (0.820) C:NA T:87%**	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	**0.862 ± 0.571 (1.13) C:77% T:89%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**2.08 ± 1.29 (1.95)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-305 **Lab ID: 60268653005** Collected: 04/18/18 14:50 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.278 ± 0.336 (0.512) C:NA T:89%**	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	**0.398 ± 0.442 (0.931) C:82% T:83%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.676 ± 0.778 (1.44)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: MW-306 **Lab ID: 60268653006** Collected: 04/18/18 16:10 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.305 ± 0.474 (0.821) C:NA T:82%**	pCi/L	05/09/18 21:02	13982-63-3	
Radium-228	EPA 904.0	**-0.109 ± 0.413 (0.963) C:81% T:91%**	pCi/L	05/14/18 16:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.305 ± 0.887 (1.78)**	pCi/L	05/15/18 11:17	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Sample: FIELD BLANK **Lab ID: 60268653010** Collected: 04/18/18 16:30 Received: 04/20/18 08:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0740 ± 0.338 (0.200) C:NA T:87%**	pCi/L	05/09/18 21:16	13982-63-3	
Radium-228	EPA 904.0	**0.820 ± 0.416 (0.745) C:82% T:92%**	pCi/L	05/14/18 16:29	15262-20-1	
Total Radium	Total Radium Calculation	**0.894 ± 0.754 (0.945)**	pCi/L	05/15/18 11:27	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

QC Batch: 296662 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60268653001, 60268653002, 60268653003, 60268653004, 60268653005, 60268653006, 60268653010

METHOD BLANK: 1452104 Matrix: Water
Associated Lab Samples: 60268653001, 60268653002, 60268653003, 60268653004, 60268653005, 60268653006, 60268653010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.550 ± 0.326 (0.592) C:82% T:89%	pCi/L	05/14/18 16:30	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

QC Batch: 296635 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60268653001, 60268653002, 60268653003, 60268653004, 60268653005, 60268653006, 60268653010

METHOD BLANK: 1452068 Matrix: Water
Associated Lab Samples: 60268653001, 60268653002, 60268653003, 60268653004, 60268653005, 60268653006, 60268653010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0634 ± 0.289 (0.172) C:NA T:93%	pCi/L	05/09/18 20:47	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALIFIERS

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

WORKORDER QUALIFIERS

WO: 60268653

[1] Rev. 1 7/6/2018

[2] Samples MW-307, MW-308, MW-309 have been omitted at the request of the client.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Gen Sta/25216072.18
Pace Project No.: 60268653

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60268653001	**MW-301**	EPA 903.1	296635		
60268653002	**MW-302**	EPA 903.1	296635		
60268653003	**MW-303**	EPA 903.1	296635		
60268653004	**MW-304**	EPA 903.1	296635		
60268653005	**MW-305**	EPA 903.1	296635		
60268653006	**MW-306**	EPA 903.1	296635		
60268653010	**FIELD BLANK**	EPA 903.1	296635		
60268653001	**MW-301**	EPA 904.0	296662		
60268653002	**MW-302**	EPA 904.0	296662		
60268653003	**MW-303**	EPA 904.0	296662		
60268653004	**MW-304**	EPA 904.0	296662		
60268653005	**MW-305**	EPA 904.0	296662		
60268653006	**MW-306**	EPA 904.0	296662		
60268653010	**FIELD BLANK**	EPA 904.0	296662		
60268653001	**MW-301**	Total Radium Calculation	298436		
60268653002	**MW-302**	Total Radium Calculation	298436		
60268653003	**MW-303**	Total Radium Calculation	298436		
60268653004	**MW-304**	Total Radium Calculation	298436		
60268653005	**MW-305**	Total Radium Calculation	298436		
60268653006	**MW-306**	Total Radium Calculation	298436		
60268653010	**FIELD BLANK**	Total Radium Calculation	298443		

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Sample Condition Upon Receipt

WO# : 60268653

60268653

Client Name: SCS ENGINEERS

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 4122 4945 7160 / 4122 4925 7056 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☐

Thermometer Used: T-300 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 2.0 **Corr. Factor** +1.2 **Corrected** 3.2

Date and initials of person examining contents: BEH 4-20-18

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☐Yes ☒No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: NT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☒N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / (N) Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: JJS Date: 4.24.18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	SCS Engineers	Report To:	Meghan Blodgett	Attention:	Meghan Blodgett/Jess Valcheff
Address:	2830 Dairy Drive	Copy To:	Tom Karwaski	Company Name:	SCS Engineers
	Madison WI 53718			Address:	
Email To:	mblodgett@scsengineers.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	608-216-7362 Fax:	Project Name:	Ottumwa Generating Station	Pace Project Manager:	Trudy Gipson 913-563-1405
Requested Due Date/TAT:		Project Number:	25216072.18	Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: IA

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	Valid Matrix Codes MATRIX / CODE: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301		WT	G	xxx	xxx	4-18-18	10:15	7.2	2			2						Y	X	X	X		60216653
2	MW-302		WT	G	xxx	xxx		11:10	10.7	2			2							X	X	X		
3	MW-303		WT	G	xxx	xxx		12:20	8.2	2			2							X	X	X		
4	MW-304		WT	G	xxx	xxx		13:40	12.5	2			2							X	X	X		
5	MW-305		WT	G	xxx	xxx		14:50	12.8	2			2							X	X	X		
6	MW-306		WT	G	xxx	xxx		16:10	12.1	2			2							X	X	X		
7	MW-307		WT	G	xxx	xxx	4-16-18	20:55	11.6	2			2							X	X	X		
8	MW-308		WT	G	xxx	xxx		17:40	11.5	2			2							X	X	X		
9	MW-309		WT	G	xxx	xxx		19:55	11.2	2			2							X	X	X		
10	FIELD BLANK		WT	G	xxx	xxx	4-18-18	16:36	—	2			2							X	X	X		
11																								
12																								

Residual Chlorine (Y/N): BH 4-20-18 — 2 - 2BP — 2 - 6P/N

Pace Project No./ Lab I.D.: 60216653 01 02 03 04 05 06 07 08 09 10

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219					4-20-18	0845	3.2	Y	Y	Y

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

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Chain of Custody

Pace Analytical
www.pacelabs.com

☐ Samples were sent directly to the Subcontracting Laboratory.

State Of Origin: IA

Workorder: 60268653 **Workorder Name:** Ottumwa Gen Sta/25216072.18 **Owner Received Date:** 4/20/2018 **Results Requested By:** 5/15/2018

Report To	Subcontract To
Trudy Gipson Pace Analytical Kansas 9608 Loiret Blvd. Lenexa, KS 66219 Phone 1(913)563-1405	Pace Analytical Pittsburgh 1638 Roseytown Road Suites 2,3, & 4 Greensburg, PA 15601 Phone (724)850-5600

WO# : 30250798

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers HNO3	903.1 Radium-226	904.0 Radium-228 & Total Radium	LAB USE ONLY
1	MW-301	PS	4/18/2018 10:15	60268653001	Water	2	X	X	001
2	MW-302	PS	4/18/2018 11:10	60268653002	Water	2	X	X	002
3	MW-303	PS	4/18/2018 12:20	60268653003	Water	2	X	X	003
4	MW-304	PS	4/18/2018 13:40	60268653004	Water	2	X	X	004
5	MW-305	PS	4/18/2018 14:50	60268653005	Water	2	X	X	005
6	MW-306	PS	4/18/2018 16:10	60268653006	Water	2	X	X	006
7	MW-307	PS	4/16/2018 20:55	60268653007	Water	2	X	X	007
8	MW-308	PS	4/16/2018 17:40	60268653008	Water	2	X	X	008
9	MW-309	PS	4/16/2018 19:55	60268653009	Water	2	X	X	009
10	FIELD BLANK	PS	4/18/2018 16:30	60268653010	Water	2	X	X	010

Transfers	Released By	Date/Time	Received By	Date/Time
1	EBrockett / Pcsi	4/25/18 1625	[signature]	4-26-18 0935
2				
3				

Comments

Cooler Temperature on Receipt ___°C | Custody Seal Y or (N) | Received on Ice (Y) or N | Samples Intact (Y) or N

****In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Pittsburgh Lab Sample Condition Upon Receipt

Face Analytical

Client Name: Pace Texas

Project # 30250798

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace Other _____

Label DS

LIMS Login DS

Tracking #: 4369 7273 9837

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

Thermometer Used NA Type of Ice: Wet Blue None

Cooler Temperature Observed Temp ___ °C Correction Factor: ___ °C Final Temp: ___ °C

Temp should be above freezing to 6°C

pH paper Lot# 1003671 Date and Initials of person examining contents: DS 4-26-18

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:		✓		4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous Compliance/NPDES sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. All containers needing preservation are found to be in compliance with EPA recommendation. exceptions: VOA, coliform, TOC, O&G, Phenolics	✓ ✓			16. phc2 Initial when completed DS Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present: Trip Blank Custody Seals Present			✓	18.
Rad Aqueous Samples Screened > 0.5 mrem/hr		✓		Initial when completed: DS Date: 4-26-18

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

A2 Assessment Monitoring Round 2, August 2018

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

August 31, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: Ottumwa Generating Station
Pace Project No.: 60278161

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

Pace Analytical Services, LLC
9608 Loiret Blvd.
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SAMPLE SUMMARY

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60278161001	**MW-301**	Water	08/14/18 17:00	08/17/18 09:20
60278161002	**MW-302**	Water	08/14/18 18:10	08/17/18 09:20
60278161003	**MW-303**	Water	08/14/18 19:20	08/17/18 09:20
60278161004	**MW-304**	Water	08/15/18 15:55	08/17/18 09:20
60278161005	**MW-305**	Water	08/15/18 17:30	08/17/18 09:20
60278161006	**MW-306**	Water	08/15/18 18:45	08/17/18 09:20
60278161007	**FIELD BLANK**	Water	08/14/18 17:55	08/17/18 09:20

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SAMPLE ANALYTE COUNT

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60278161001	**MW-301**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
60278161002	**MW-302**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
60278161003	**MW-303**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
60278161004	**MW-304**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
60278161005	**MW-305**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60278161006	**MW-306**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60278161007	**FIELD BLANK**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 245.1	EMR	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	WNM	2	PASI-K

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-301 **Lab ID: 60278161001** Collected: 08/14/18 17:00 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 17:00		
Field pH	**6.26**	Std. Units	0.10	0.050	1		08/14/18 17:00		
Field Temperature	**20.4**	deg C	0.50	0.25	1		08/14/18 17:00		
Field Specific Conductance	**867**	umhos/cm	1.0	1.0	1		08/14/18 17:00		
Oxygen, Dissolved	**3.18**	mg/L			1		08/14/18 17:00	7782-44-7	
REDOX	**-55.5**	mV			1		08/14/18 17:00		
Turbidity	**0.52**	NTU	1.0	1.0	1		08/14/18 17:00		
Groundwater Elevation	**680.91**	feet			1		08/14/18 17:00		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**735**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:39	7440-42-8	
Calcium	**72.5**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:39	7440-70-2	
Lithium	**26.5**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:39	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.20J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:33	7440-36-0	
Arsenic	**0.29J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:33	7440-38-2	
Barium	**44.5**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:33	7440-39-3	
Beryllium	**0.14J**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:33	7440-41-7	
Cadmium	**0.16J**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:33	7440-43-9	
Chromium	**0.25J**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:33	7440-47-3	
Cobalt	**1.4**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:33	7440-48-4	
Lead	**0.18J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:33	7439-92-1	
Molybdenum	**1.3**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:33	7439-98-7	
Selenium	**6.3**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:33	7782-49-2	
Thallium	**0.16J**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:33	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/25/18 20:30	08/27/18 11:20	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-302 **Lab ID: 60278161002** Collected: 08/14/18 18:10 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 18:10		
Field pH	**6.76**	Std. Units	0.10	0.050	1		08/14/18 18:10		
Field Temperature	**14.3**	deg C	0.50	0.25	1		08/14/18 18:10		
Field Specific Conductance	**2304**	umhos/cm	1.0	1.0	1		08/14/18 18:10		
Oxygen, Dissolved	**0.17**	mg/L			1		08/14/18 18:10	7782-44-7	
REDOX	**-336.6**	mV			1		08/14/18 18:10		
Turbidity	**4.01**	NTU	1.0	1.0	1		08/14/18 18:10		
Groundwater Elevation	**656.05**	feet			1		08/14/18 18:10		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1240**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:49	7440-42-8	
Calcium	**185**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:49	7440-70-2	
Lithium	**6.9J**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:49	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:35	7440-36-0	
Arsenic	**0.30J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:35	7440-38-2	
Barium	**18.3**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:35	7440-39-3	
Beryllium	**<0.12**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:35	7440-41-7	
Cadmium	**0.21J**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:35	7440-43-9	
Chromium	**0.48J**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:35	7440-47-3	
Cobalt	**1.5**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:35	7440-48-4	
Lead	**0.12J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:35	7439-92-1	
Molybdenum	**0.54J**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:35	7439-98-7	
Selenium	**<0.16**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:35	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:35	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/25/18 20:30	08/27/18 11:24	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-303 **Lab ID: 60278161003** Collected: 08/14/18 19:20 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 19:20		
Field pH	**6.83**	Std. Units	0.10	0.050	1		08/14/18 19:20		
Field Temperature	**17.2**	deg C	0.50	0.25	1		08/14/18 19:20		
Field Specific Conductance	**1833**	umhos/cm	1.0	1.0	1		08/14/18 19:20		
Oxygen, Dissolved	**0.19**	mg/L			1		08/14/18 19:20	7782-44-7	
REDOX	**-307.9**	mV			1		08/14/18 19:20		
Turbidity	**1.51**	NTU	1.0	1.0	1		08/14/18 19:20		
Groundwater Elevation	**652.57**	feet			1		08/14/18 19:20		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1010**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:52	7440-42-8	
Calcium	**213**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:52	7440-70-2	
Lithium	**6.9J**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:52	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.16J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:42	7440-36-0	
Arsenic	**0.60J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:42	7440-38-2	
Barium	**77.3**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:42	7440-39-3	
Beryllium	**<0.12**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:42	7440-41-7	
Cadmium	**0.36J**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:42	7440-43-9	
Chromium	**0.19J**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:42	7440-47-3	
Cobalt	**2.2**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:42	7440-48-4	
Lead	**0.13J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:42	7439-92-1	
Molybdenum	**0.98J**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:42	7439-98-7	
Selenium	**0.35J**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:42	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:42	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/25/18 20:30	08/27/18 11:26	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-304 **Lab ID: 60278161004** Collected: 08/15/18 15:55 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 15:55		
Field pH	**7.34**	Std. Units	0.10	0.050	1		08/14/18 15:55		
Field Temperature	**15.1**	deg C	0.50	0.25	1		08/14/18 15:55		
Field Specific Conductance	**2085**	umhos/cm	1.0	1.0	1		08/14/18 15:55		
Oxygen, Dissolved	**0.21**	mg/L			1		08/14/18 15:55	7782-44-7	
REDOX	**35.5**	mV			1		08/14/18 15:55		
Turbidity	**81.42**	NTU	1.0	1.0	1		08/14/18 15:55		
Groundwater Elevation	**656.35**	feet			1		08/14/18 15:55		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1000**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:54	7440-42-8	
Calcium	**138**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:54	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:54	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.19J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:44	7440-36-0	
Arsenic	**1.3**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:44	7440-38-2	
Barium	**87.4**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:44	7440-39-3	
Beryllium	**0.21J**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:44	7440-41-7	
Cadmium	**0.17J**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:44	7440-43-9	
Chromium	**5.9**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:44	7440-47-3	
Cobalt	**0.92J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:44	7440-48-4	
Lead	**0.81J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:44	7439-92-1	
Molybdenum	**2.4**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:44	7439-98-7	
Selenium	**0.50J**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:44	7782-49-2	
Thallium	**0.15J**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:44	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/25/18 20:30	08/27/18 11:27	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-305 **Lab ID: 60278161005** Collected: 08/15/18 17:30 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 17:30		
Field pH	**7.21**	Std. Units	0.10	0.050	1		08/14/18 17:30		
Field Temperature	**14.8**	deg C	0.50	0.25	1		08/14/18 17:30		
Field Specific Conductance	**1832**	umhos/cm	1.0	1.0	1		08/14/18 17:30		
Oxygen, Dissolved	**0.18**	mg/L			1		08/14/18 17:30	7782-44-7	
REDOX	**31.0**	mV			1		08/14/18 17:30		
Turbidity	**14.90**	NTU	1.0	1.0	1		08/14/18 17:30		
Groundwater Elevation	**661.56**	feet			1		08/14/18 17:30		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**911**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:56	7440-42-8	
Calcium	**102**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:56	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:56	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:46	7440-36-0	
Arsenic	**0.72J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:46	7440-38-2	
Barium	**118**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:46	7440-39-3	
Beryllium	**<0.12**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:46	7440-41-7	
Cadmium	**0.086J**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:46	7440-43-9	
Chromium	**0.41J**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:46	7440-47-3	
Cobalt	**15.6**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:46	7440-48-4	
Lead	**0.31J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:46	7439-92-1	
Molybdenum	**6.5**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:46	7439-98-7	
Selenium	**0.36J**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:46	7782-49-2	
Thallium	**0.33J**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:46	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.090**	ug/L	0.20	0.090	1	08/22/18 11:50	08/22/18 17:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1060**	mg/L	5.0	5.0	1		08/22/18 13:57		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**7.0**	Std. Units	0.10	0.10	1		08/22/18 11:45		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**265**	mg/L	20.0	9.2	20		08/31/18 03:23	16887-00-6	
Fluoride	**0.44**	mg/L	0.20	0.063	1		08/30/18 22:42	16984-48-8	
Sulfate	**139**	mg/L	10.0	2.4	10		08/30/18 22:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: MW-306 **Lab ID: 60278161006** Collected: 08/15/18 18:45 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/14/18 18:45		
Field pH	**6.74**	Std. Units	0.10	0.050	1		08/14/18 18:45		
Field Temperature	**14.6**	deg C	0.50	0.25	1		08/14/18 18:45		
Field Specific Conductance	**1271**	umhos/cm	1.0	1.0	1		08/14/18 18:45		
Oxygen, Dissolved	**0.15**	mg/L			1		08/14/18 18:45	7782-44-7	
REDOX	**22.8**	mV			1		08/14/18 18:45		
Turbidity	**3.95**	NTU	1.0	1.0	1		08/14/18 18:45		
Groundwater Elevation	**668.66**	feet			1		08/14/18 18:45		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**915**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 10:58	7440-42-8	
Calcium	**78.9**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 10:58	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 10:58	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:57	7440-36-0	
Arsenic	**0.65J**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:57	7440-38-2	
Barium	**51.6**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 16:57	7440-39-3	
Beryllium	**<0.12**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 16:57	7440-41-7	
Cadmium	**0.76**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 16:57	7440-43-9	
Chromium	**0.70J**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 16:57	7440-47-3	
Cobalt	**5.5**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 16:57	7440-48-4	
Lead	**0.20J**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 16:57	7439-92-1	
Molybdenum	**4.7**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 16:57	7439-98-7	
Selenium	**0.21J**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 16:57	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 16:57	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/23/18 11:07	08/24/18 15:23	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**840**	mg/L	5.0	5.0	1		08/22/18 13:57		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**6.6**	Std. Units	0.10	0.10	1		08/22/18 11:46		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**58.2**	mg/L	5.0	2.3	5		08/31/18 00:06	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.063	1		08/30/18 23:10	16984-48-8	
Sulfate	**275**	mg/L	20.0	4.7	20		08/31/18 00:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Sample: FIELD BLANK **Lab ID: 60278161007** Collected: 08/14/18 17:55 Received: 08/17/18 09:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**<12.5**	ug/L	100	12.5	1	08/22/18 09:02	08/28/18 11:01	7440-42-8	
Calcium	**0.13J**	mg/L	0.20	0.054	1	08/22/18 09:02	08/28/18 11:01	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	08/22/18 09:02	08/28/18 11:01	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 17:04	7440-36-0	
Arsenic	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 17:04	7440-38-2	
Barium	**<0.34**	ug/L	1.0	0.34	1	08/22/18 09:02	08/27/18 17:04	7440-39-3	
Beryllium	**<0.12**	ug/L	0.50	0.12	1	08/22/18 09:02	08/27/18 17:04	7440-41-7	
Cadmium	**<0.070**	ug/L	0.50	0.070	1	08/22/18 09:02	08/27/18 17:04	7440-43-9	
Chromium	**<0.19**	ug/L	1.0	0.19	1	08/22/18 09:02	08/27/18 17:04	7440-47-3	
Cobalt	**<0.15**	ug/L	1.0	0.15	1	08/22/18 09:02	08/27/18 17:04	7440-48-4	
Lead	**<0.12**	ug/L	1.0	0.12	1	08/22/18 09:02	08/27/18 17:04	7439-92-1	
Molybdenum	**<0.13**	ug/L	1.0	0.13	1	08/22/18 09:02	08/27/18 17:04	7439-98-7	
Selenium	**<0.16**	ug/L	1.0	0.16	1	08/22/18 09:02	08/27/18 17:04	7782-49-2	
Thallium	**<0.14**	ug/L	1.0	0.14	1	08/22/18 09:02	08/27/18 17:04	7440-28-0	
245.1 Mercury	Analytical Method: EPA 245.1 Preparation Method: EPA 245.1								
Mercury	**<0.083**	ug/L	0.20	0.083	1	08/25/18 20:30	08/27/18 11:29	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		08/24/18 13:36		H1
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**5.6**	Std. Units	0.10	0.10	1		08/24/18 15:05		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**<0.46**	mg/L	1.0	0.46	1		08/31/18 01:02	16887-00-6	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		08/31/18 01:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 540781 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60278161005

METHOD BLANK: 2215597 Matrix: Water
Associated Lab Samples: 60278161005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	08/22/18 16:57	

LABORATORY CONTROL SAMPLE: 2215598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215599 2215600

Parameter	Units	60277973001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	3.4	3.2	68	64	70-130	7	20	M1

MATRIX SPIKE SAMPLE: 2215601

Parameter	Units	60277408002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	3.2	64	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 541044 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60278161006

METHOD BLANK: 2216641 Matrix: Water
Associated Lab Samples: 60278161006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.083	0.20	0.083	08/24/18 14:49	

LABORATORY CONTROL SAMPLE: 2216642

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2216643 2216644

Parameter	Units	60278315006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	<0.17	1.9	0	39	70-130		20	H3,M1

MATRIX SPIKE SAMPLE: 2216645

Parameter	Units	60278315002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	3.2	64	70-130	H3,M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 541446 Analysis Method: EPA 245.1
QC Batch Method: EPA 245.1 Analysis Description: 245.1 Mercury
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161007

METHOD BLANK: 2219109 Matrix: Water
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.083	0.20	0.083	08/27/18 11:14	

LABORATORY CONTROL SAMPLE: 2219110

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2219111 2219112

Parameter	Units	60278161001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.083	5	5	5.1	5.1	102	102	70-130	1	20	

MATRIX SPIKE SAMPLE: 2219113

Parameter	Units	60278406001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	ND	5	6.0	121	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 540758 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161005, 60278161006, 60278161007

METHOD BLANK: 2215516 Matrix: Water
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161005, 60278161006, 60278161007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	08/28/18 10:36	
Calcium	mg/L	<0.054	0.20	0.054	08/28/18 10:36	
Lithium	ug/L	<4.6	10.0	4.6	08/28/18 10:36	

LABORATORY CONTROL SAMPLE: 2215517

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	978	98	80-120	
Calcium	mg/L	10	10.1	101	80-120	
Lithium	ug/L	1000	990	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215518 2215519

Parameter	Units	60278161001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	735	1000	1000	1720	1760	99	102	75-125	2	20	
Calcium	mg/L	72.5	10	10	80.9	83.2	84	108	75-125	3	20	
Lithium	ug/L	26.5	1000	1000	991	1010	96	98	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 540759 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161005, 60278161006, 60278161007

METHOD BLANK: 2215520 Matrix: Water
Associated Lab Samples: 60278161001, 60278161002, 60278161003, 60278161004, 60278161005, 60278161006, 60278161007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.15	1.0	0.15	08/27/18 16:28	
Arsenic	ug/L	<0.15	1.0	0.15	08/27/18 16:28	
Barium	ug/L	<0.34	1.0	0.34	08/27/18 16:28	
Beryllium	ug/L	<0.12	0.50	0.12	08/27/18 16:28	
Cadmium	ug/L	<0.070	0.50	0.070	08/27/18 16:28	
Chromium	ug/L	<0.19	1.0	0.19	08/27/18 16:28	
Cobalt	ug/L	<0.15	1.0	0.15	08/27/18 16:28	
Lead	ug/L	<0.12	1.0	0.12	08/27/18 16:28	
Molybdenum	ug/L	<0.13	1.0	0.13	08/27/18 16:28	
Selenium	ug/L	<0.16	1.0	0.16	08/27/18 16:28	
Thallium	ug/L	<0.14	1.0	0.14	08/27/18 16:28	

LABORATORY CONTROL SAMPLE: 2215521

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.7	102	80-120	
Arsenic	ug/L	40	40.4	101	80-120	
Barium	ug/L	40	40.8	102	80-120	
Beryllium	ug/L	40	39.6	99	80-120	
Cadmium	ug/L	40	39.7	99	80-120	
Chromium	ug/L	40	38.2	96	80-120	
Cobalt	ug/L	40	37.0	92	80-120	
Lead	ug/L	40	39.4	99	80-120	
Molybdenum	ug/L	40	39.1	98	80-120	
Selenium	ug/L	40	40.5	101	80-120	
Thallium	ug/L	40	37.9	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215522 2215523

Parameter	Units	60278161002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.15	40	40	36.4	36.2	91	90	75-125	0	20	
Arsenic	ug/L	0.30J	40	40	39.7	40.2	99	100	75-125	1	20	
Barium	ug/L	18.3	40	40	54.8	55.1	91	92	75-125	1	20	
Beryllium	ug/L	<0.12	40	40	37.9	38.2	95	95	75-125	1	20	
Cadmium	ug/L	0.21J	40	40	33.4	33.3	83	83	75-125	0	20	
Chromium	ug/L	0.48J	40	40	34.6	35.0	85	86	75-125	1	20	
Cobalt	ug/L	1.5	40	40	37.9	38.5	91	93	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2215522 2215523

Parameter	Units	60278161002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	0.12J	40	40	34.9	35.2	87	88	75-125	1	20	
Molybdenum	ug/L	0.54J	40	40	38.3	38.2	95	94	75-125	0	20	
Selenium	ug/L	<0.16	40	40	39.1	39.4	97	98	75-125	1	20	
Thallium	ug/L	<0.14	40	40	34.2	34.4	85	86	75-125	1	20	

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 540802 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60278161005, 60278161006

METHOD BLANK: 2215658 Matrix: Water
Associated Lab Samples: 60278161005, 60278161006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/22/18 13:57	

LABORATORY CONTROL SAMPLE: 2215659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2215660

Parameter	Units	60278161005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1060	1050	1	10	

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 541232 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60278161007

METHOD BLANK: 2217701 Matrix: Water
Associated Lab Samples: 60278161007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/24/18 13:36	

LABORATORY CONTROL SAMPLE: 2217702

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2217703

Parameter	Units	60278381001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	277	287	4	10	

SAMPLE DUPLICATE: 2217704

Parameter	Units	60278475001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1300	1260	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 540818 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60278161005, 60278161006

SAMPLE DUPLICATE: 2215696

Parameter	Units	60278161005 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	6.9	1	5	H6

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 541348
QC Batch Method: SM 4500-H+B
Analysis Method: SM 4500-H+B
Analysis Description: 4500H+B pH
Associated Lab Samples: 60278161007

SAMPLE DUPLICATE: 2218325

Parameter	Units	60278315001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.9	6.9	0	5	H6

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QUALITY CONTROL DATA

Project: Ottumwa Generating Station
Pace Project No.: 60278161

QC Batch: 541727 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60278161005, 60278161006, 60278161007

METHOD BLANK: 2219980 Matrix: Water
Associated Lab Samples: 60278161005, 60278161006, 60278161007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	08/30/18 22:14	
Fluoride	mg/L	<0.063	0.20	0.063	08/30/18 22:14	
Sulfate	mg/L	<0.24	1.0	0.24	08/30/18 22:14	

LABORATORY CONTROL SAMPLE: 2219981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Fluoride	mg/L	2.5	2.7	107	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2219982 2219983

Parameter	Units	60278161007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	<0.46	5	5	5.3	5.4	105	108	80-120	3	15	
Sulfate	mg/L	<0.24	5	5	5.5	5.3	109	107	80-120	2	15	

SAMPLE DUPLICATE: 2219984

Parameter	Units	60278161006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	58.2	62.4	7	15	
Fluoride	mg/L	0.13J	0.13J		15	
Sulfate	mg/L	275	284	3	15	

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QUALIFIERS

Project: Ottumwa Generating Station
Pace Project No.: 60278161

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

H1	Analysis conducted outside the EPA method holding time.
H3	Sample was received or analysis requested beyond the recognized method holding time.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Ottumwa Generating Station
Pace Project No.: 60278161

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60278161001	MW-301		541785		
60278161002	MW-302		541785		
60278161003	MW-303		541785		
60278161004	MW-304		541785		
60278161005	MW-305		541785		
60278161006	MW-306		541785		
60278161001	MW-301	EPA 3010	540758	EPA 6010	540825
60278161002	MW-302	EPA 3010	540758	EPA 6010	540825
60278161003	MW-303	EPA 3010	540758	EPA 6010	540825
60278161004	MW-304	EPA 3010	540758	EPA 6010	540825
60278161005	MW-305	EPA 3010	540758	EPA 6010	540825
60278161006	MW-306	EPA 3010	540758	EPA 6010	540825
60278161007	FIELD BLANK	EPA 3010	540758	EPA 6010	540825
60278161001	MW-301	EPA 3010	540759	EPA 6020	540826
60278161002	MW-302	EPA 3010	540759	EPA 6020	540826
60278161003	MW-303	EPA 3010	540759	EPA 6020	540826
60278161004	MW-304	EPA 3010	540759	EPA 6020	540826
60278161005	MW-305	EPA 3010	540759	EPA 6020	540826
60278161006	MW-306	EPA 3010	540759	EPA 6020	540826
60278161007	FIELD BLANK	EPA 3010	540759	EPA 6020	540826
60278161001	MW-301	EPA 245.1	541446	EPA 245.1	541456
60278161002	MW-302	EPA 245.1	541446	EPA 245.1	541456
60278161003	MW-303	EPA 245.1	541446	EPA 245.1	541456
60278161004	MW-304	EPA 245.1	541446	EPA 245.1	541456
60278161005	MW-305	EPA 245.1	540781	EPA 245.1	540889
60278161006	MW-306	EPA 245.1	541044	EPA 245.1	541205
60278161007	FIELD BLANK	EPA 245.1	541446	EPA 245.1	541456
60278161005	MW-305	SM 2540C	540802		
60278161006	MW-306	SM 2540C	540802		
60278161007	FIELD BLANK	SM 2540C	541232		
60278161005	MW-305	SM 4500-H+B	540818		
60278161006	MW-306	SM 4500-H+B	540818		
60278161007	FIELD BLANK	SM 4500-H+B	541348		
60278161005	MW-305	EPA 9056	541727		
60278161006	MW-306	EPA 9056	541727		
60278161007	FIELD BLANK	EPA 9056	541727		

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Sample Condition Upon Receipt

WO# : 60278161

60278161

Client Name: SCS Engineers

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 4368 7279 0044 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-297 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 2.6 Corr. Factor +0.9 Corrected 3.5

Date and initials of person examining contents: AC 8/18

Temperature should be above freezing to 6°C

Chain of Custody present:	☐Yes ☐No ☐N/A	no COC
Chain of Custody relinquished:	☐Yes ☐No ☐N/A	
Samples arrived within holding time:	☐Yes ☐No ☐N/A	received: (Fed ex: 8/17/18 9:20a)
Short Hold Time analyses (<72hr):	☐Yes ☐No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☐No ☐N/A	Sample 1: MW-305, 8/15/18, 17:30, 2BPIN BP2U 2BP3N
Sufficient volume:	☐Yes ☐No ☐N/A	
Correct containers used:	☐Yes ☐No ☐N/A	
Pace containers used:	☐Yes ☐No ☐N/A	Sample 2: MW-306, 8/15/18, 18:45, 2BPIN BP2U 2BP3N
Containers intact:	☐Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☐Yes ☐No ☐N/A	
~~Samples contain multiple phases?~~ Matrix.	☐Yes ☐No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
~~Cyanide water sample checks:~~ Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☐N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☐N/A	
~~Additional labels attached to 5035A / TX1005 vials in the field?~~	☐Yes ☐No ☐N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

See page 2

Project Manager Review: HWK Date: 8-21-2018

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Sample Condition Upon Receipt

60378161

Client Name: SCS Engineers

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ Ziplc

Thermometer Used: T299 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 15.6 Corr. Factor +1.0 Corrected 16.6

Date and initials of person examining contents: 8.17.18 HT

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☐Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☐No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☑No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Meghan B Date/Time: 8/20/2018 09:20

Comments/ Resolution: TDS, Anions, pH out of Temp. → will re-Sample MW-301 → MW-304

Project Manager Review: HWK Date: 8-21-2018

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:

Company:	SCS Engineers
Address:	2830 Dairy Drive
	Madison WI 53718
Email To:	mblodgett@scsengineers.com
Phone: 608-216-7362	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Generating Station
Project Number:	25216072.18

Section C Invoice Information:

Attention:	Meghan Blodgett/Jess Valcheff
Company Name:	SCS Engineers
Address:	
Pace Quote Reference:	
Pace Project Manager:	Trudy Gipson 913-563-1405
Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH	6010 Total Metals: B-Ca	See Attached Table 1	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				DATE	TIME	DATE	TIME												N	N	N							
1	MW-301	WT	G	xxx	xxx	8/14/18	17:00	20.4	2	1		1						X			X	X	X	X	X	BP2U, BP3N		60278161
2	MW-302	WT	G	xxx	xxx	8/14/18	18:10	19.3	2	1		1						X			X	X	X	X	X			
3	MW-303	WT	G	xxx	xxx	8/14/18	19:20	17.2	2	1		1						X			X	X	X	X	X			
4	MW-304	WT	G	xxx	xxx	8/15/18	15:55	15.1	2	1		1						X			X	X	X	X	X			
5	MW-305	WT	G	xxx	xxx	8/15/18	17:30	14.8	2	1		1						X			X	X	X	X	X			
6	MW-306	WT	G	xxx	xxx	8/15/18	18:45	14.6	2	1		1						X			X	X	X	X	X			
7	VOID ~~MW-307~~ Not Sampled	WT	G	xxx	xxx				3	1		2						X	X	X	X	X	X					
8	VOID ~~MW-308~~ Not Sampled	WT	G	xxx	xxx				3	1		2						X	X	X	X	X	X					
9	VOID ~~MW-309~~ Not Sampled	WT	G	xxx	xxx				3	1		2						X	X	X	X	X	X					
10	FIELD BLANK	WT	G	xxx	xxx	8/14/18	17:55		3	1		2						X	X	X	X	X	X		BP2U, BP3N (2)			
11																												
12																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Grove SCS	8-16-18	16:00	Holly Fowler PASI	8-17-18	0920
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl						

SAMPLE CONDITIONS			
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
16.6	y	y	y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

60278/61

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

	Parameter	MW-301	MW-302	MW-303	MW-304	MW-305	MW-306	MW-307	MW-308	MW-309	Field Blank	TOTAL
Appendix III Parameters	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	x	x	x	x				x	7
	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
Appendix IV Parameters	Antimony	x	x	x	x	x	x				x	7
	Arsenic	x	x	x	x	x	x				x	7
	Barium	x	x	x	x	x	x				x	7
	Beryllium	x	x	x	x	x	x				x	7
	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	x	x	x	x				x	7
	Lead	x	x	x	x	x	x				x	7
	Lithium	x	x	x	x	x	x				x	7
	Mercury	x	x	x	x	x	x				x	7
	Molybdenum	x	x	x	x	x	x				x	7
	Selenium	x	x	x	x	x	x				x	7
	Thallium	x	x	x	x	x	x				x	7
	Radium	x	x	x	x	x	x				x	7
Field Parameters	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:\25216072.00\Data and Calculations\Field Notes\[OGS_CCR_Rule_Sampling_2018_April.xls]Sheet1

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 05, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on August 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

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CERTIFICATIONS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60278217001	**MW-301**	Water	08/14/18 17:00	08/17/18 09:20
60278217002	**MW-302**	Water	08/14/18 18:10	08/17/18 09:20
60278217003	**MW-303**	Water	08/14/18 19:20	08/17/18 09:20
60278217004	**MW-304**	Water	08/15/18 15:55	08/17/18 09:20
60278217005	**MW-305**	Water	08/15/18 17:30	08/17/18 09:20
60278217006	**MW-306**	Water	08/15/18 18:45	08/17/18 09:20
60278217007	**FIELD BLANK**	Water	08/14/18 17:55	08/17/18 09:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60278217001	**MW-301**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217002	**MW-302**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217003	**MW-303**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217004	**MW-304**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217005	**MW-305**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217006	**MW-306**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60278217007	**FIELD BLANK**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-301 **Lab ID: 60278217001** Collected: 08/14/18 17:00 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.417 ± 0.447 (0.653) C:NA T:70%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.773 ± 0.511 (0.964) C:70% T:63%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.19 ± 0.958 (1.62)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-302 **Lab ID: 60278217002** Collected: 08/14/18 18:10 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.624 ± 0.456 (0.560) C:NA T:65%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.499 ± 0.417 (0.834) C:73% T:74%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.12 ± 0.873 (1.39)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-303 **Lab ID: 60278217003** Collected: 08/14/18 19:20 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.02 ± 0.602 (0.694) C:NA T:60%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.799 ± 0.420 (0.737) C:74% T:80%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.82 ± 1.02 (1.43)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-304 **Lab ID: 60278217004** Collected: 08/15/18 15:55 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.78 ± 0.698 (0.659) C:NA T:68%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**1.96 ± 0.630 (0.822) C:71% T:77%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**3.74 ± 1.33 (1.48)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-305 **Lab ID: 60278217005** Collected: 08/15/18 17:30 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.960 ± 0.491 (0.492) C:NA T:70%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.366 ± 0.400 (0.831) C:69% T:75%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.33 ± 0.891 (1.32)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: MW-306 **Lab ID: 60278217006** Collected: 08/15/18 18:45 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.482 ± 0.598 (0.903) C:NA T:64%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.503 ± 0.491 (1.01) C:73% T:68%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**0.985 ± 1.09 (1.91)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Sample: FIELD BLANK **Lab ID: 60278217007** Collected: 08/14/18 17:55 Received: 08/17/18 09:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.531 ± 0.486 (0.681) C:NA T:68%**	pCi/L	09/05/18 10:48	13982-63-3	
Radium-228	EPA 904.0	**0.623 ± 0.447 (0.868) C:71% T:75%**	pCi/L	09/04/18 11:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.15 ± 0.933 (1.55)**	pCi/L	09/05/18 12:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

QC Batch: 310840 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60278217001, 60278217002, 60278217003, 60278217004, 60278217005, 60278217006, 60278217007

METHOD BLANK: 1518544 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.307 ± 0.313 (0.646) C:78% T:90%	pCi/L	09/04/18 11:33	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

QC Batch: 310839 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60278217001, 60278217002, 60278217003, 60278217004, 60278217005, 60278217006, 60278217007

METHOD BLANK: 1518543 Matrix: Water
Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.211 ± 0.371 (0.596) C:NA T:79%	pCi/L	09/05/18 10:12	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60278217

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60278217001	**MW-301**	EPA 903.1	310839		
60278217002	**MW-302**	EPA 903.1	310839		
60278217003	**MW-303**	EPA 903.1	310839		
60278217004	**MW-304**	EPA 903.1	310839		
60278217005	**MW-305**	EPA 903.1	310839		
60278217006	**MW-306**	EPA 903.1	310839		
60278217007	**FIELD BLANK**	EPA 903.1	310839		
60278217001	**MW-301**	EPA 904.0	310840		
60278217002	**MW-302**	EPA 904.0	310840		
60278217003	**MW-303**	EPA 904.0	310840		
60278217004	**MW-304**	EPA 904.0	310840		
60278217005	**MW-305**	EPA 904.0	310840		
60278217006	**MW-306**	EPA 904.0	310840		
60278217007	**FIELD BLANK**	EPA 904.0	310840		
60278217001	**MW-301**	Total Radium Calculation	311947		
60278217002	**MW-302**	Total Radium Calculation	311947		
60278217003	**MW-303**	Total Radium Calculation	311947		
60278217004	**MW-304**	Total Radium Calculation	311947		
60278217005	**MW-305**	Total Radium Calculation	311947		
60278217006	**MW-306**	Total Radium Calculation	311947		
60278217007	**FIELD BLANK**	Total Radium Calculation	311947		

Pace Analytical (www.pacelabs.com)

Sample Condition Upon Receipt

WO# : 60278217

60278217

Client Name: SCS Engineer

Courier: FedEx ☐ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ Ziplc

Thermometer Used: T299 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 15.6 Corr. Factor +1.0 Corrected 16.6

Date and initials of person examining contents: ~~8-2~~ 8-17-18 HF AK 8-17-18 HF

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☑No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: HWK Date: 8/21/2018

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A — **Required** Client Information:

Company: SCS Engineers
Address: 2830 Dairy Drive
Madison WI 53718
Email To: mblodgett@scsengineers.com
Phone: 608-216-7362 Fax:
Requested Due Date/TAT:

Section B — **Required** Project Information:

Report To: Meghan Blodgett
Copy To: Tom Karwaski
Purchase Order No.:
Project Name: Ottumwa Generating Station
Project Number: 25216072.18

Section C — Invoice Information:

Attention: Meghan Blodgett/Jess Valcheff
Company Name: SCS Engineers
Address:
Pace Quote Reference:
Pace Project Manager: Trudy Gipson 913-563-1405
Pace Profile #: 6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IA

Requested Analysis Filtered (Y/N)

Section D — **Required** Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium		Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	8/14/18	17:00	14.4	2			2							X	X	X	2BPIN		001
2	MW-302	WT	G	xxx	xxx		18:10	14.3	2			2							X	X	X			002
3	MW-303	WT	G	xxx	xxx		19:20	17.2	2			2							X	X	X			003
4	MW-304	WT	G	xxx	xxx	8/15/18	15:55	15.1	2			2							X	X	X			004
5	MW-305	WT	G	xxx	xxx		17:30	14.8	2			2							X	X	X	(2) 500ML		005
6	MW-306	WT	G	xxx	xxx		18:45	14.6	2			2							X	X	X			006
7	VOID ~~MW-307~~ Not Sampled	WT	G	~~xxx~~	~~xxx~~				2			2							X	X	X			
8	VOID ~~MW-308~~ Not Sampled	WT	G	~~xxx~~	~~xxx~~				2			2							X	X	X			
9	VOID ~~MW-309~~ Not Sampled	WT	G	~~xxx~~	~~xxx~~				2			2							X	X	X			
10	FIELD BLANK	WT	G	xxx	xxx	8/14/18	17:55		2			2							X	X	X	2BPIN		007
11																								
12																								

6027 0217

Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Iverson SCS	8-16-18	16:00	Holly Fowler PASI	8-17-18	0920	16.6	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

A3 Assessment Monitoring Round 2 Resample, August 2018

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

September 12, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OGS
Pace Project No.: 60279237

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on August 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

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CERTIFICATIONS

Project: OGS
Pace Project No.: 60279237

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407
Utah Certification #: KS00021
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: OGS
Pace Project No.: 60279237

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60279237001	**MW 301**	Water	08/29/18 13:45	08/30/18 09:30
60279237002	**MW 302**	Water	08/29/18 14:30	08/30/18 09:30
60279237003	**MW 303**	Water	08/29/18 15:20	08/30/18 09:30
60279237004	**MW 304**	Water	08/29/18 16:20	08/30/18 09:30
60279237005	**FIELD BLANK**	Water	08/29/18 16:15	08/30/18 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: OGS
Pace Project No.: 60279237

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60279237001	**MW 301**	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	OL	3	PASI-K
60279237002	**MW 302**	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	OL	3	PASI-K
60279237003	**MW 303**	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	OL	3	PASI-K
60279237004	**MW 304**	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	OL	3	PASI-K
60279237005	**FIELD BLANK**	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 9056	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: OGS
Pace Project No.: 60279237

Sample: MW 301 **Lab ID: 60279237001** Collected: 08/29/18 13:45 Received: 08/30/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/29/18 13:45		
Collected Date	**08/29/2018**				1		08/29/18 13:45		
Collected Time	**1345**				1		08/29/18 13:45		
Field pH	**6.31**	Std. Units	0.10	0.050	1		08/29/18 13:45		
Field Temperature	**20.6**	deg C	0.50	0.25	1		08/29/18 13:45		
Field Specific Conductance	**781**	umhos/cm	1.0	1.0	1		08/29/18 13:45		
Oxygen, Dissolved	**4.71**	mg/L			1		08/29/18 13:45	7782-44-7	
Turbidity	**0.63**	NTU	1.0	1.0	1		08/29/18 13:45		
Groundwater Elevation	**681.09**	feet			1		08/29/18 13:45		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**532**	mg/L	5.0	5.0	1		09/04/18 11:23		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**6.5**	Std. Units	0.10	0.10	1		09/05/18 12:10		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**63.1**	mg/L	5.0	2.3	5		09/09/18 18:57	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	0.063	1		09/09/18 18:43	16984-48-8	
Sulfate	**181**	mg/L	20.0	4.7	20		09/09/18 10:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OGS
Pace Project No.: 60279237

Sample: MW 302 **Lab ID: 60279237002** Collected: 08/29/18 14:30 Received: 08/30/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/29/18 14:30		
Collected Date	**08/29/2018**				1		08/29/18 14:30		
Collected Time	**1430**				1		08/29/18 14:30		
Field pH	**6.77**	Std. Units	0.10	0.050	1		08/29/18 14:30		
Field Temperature	**14.6**	deg C	0.50	0.25	1		08/29/18 14:30		
Field Specific Conductance	**2357**	umhos/cm	1.0	1.0	1		08/29/18 14:30		
Oxygen, Dissolved	**0.23**	mg/L			1		08/29/18 14:30	7782-44-7	
Turbidity	**1.42**	NTU	1.0	1.0	1		08/29/18 14:30		
Groundwater Elevation	**655.89**	feet			1		08/29/18 14:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1840**	mg/L	5.0	5.0	1		09/04/18 11:23		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**6.7**	Std. Units	0.10	0.10	1		09/05/18 12:13		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**259**	mg/L	20.0	9.2	20		09/09/18 11:08	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.063	1		09/08/18 09:39	16984-48-8	B
Sulfate	**847**	mg/L	100	23.6	100		09/09/18 11:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OGS
Pace Project No.: 60279237

Sample: MW 303 **Lab ID: 60279237003** Collected: 08/29/18 15:20 Received: 08/30/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/29/18 15:20		
Collected Date	**08/29/2018**				1		08/29/18 15:20		
Collected Time	**1520**				1		08/29/18 15:20		
Field pH	**7.03**	Std. Units	0.10	0.050	1		08/29/18 15:20		
Field Temperature	**18.7**	deg C	0.50	0.25	1		08/29/18 15:20		
Field Specific Conductance	**1161**	umhos/cm	1.0	1.0	1		08/29/18 15:20		
Oxygen, Dissolved	**1.92**	mg/L			1		08/29/18 15:20	7782-44-7	
Turbidity	**10.13**	NTU	1.0	1.0	1		08/29/18 15:20		
Groundwater Elevation	**655.07**	feet			1		08/29/18 15:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**832**	mg/L	5.0	5.0	1		09/04/18 11:23		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.10	1		09/05/18 12:15		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**64.8**	mg/L	5.0	2.3	5		09/09/18 12:05	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.063	1		09/08/18 09:53	16984-48-8	B
Sulfate	**164**	mg/L	20.0	4.7	20		09/09/18 12:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OGS
Pace Project No.: 60279237

Sample: MW 304 **Lab ID: 60279237004** Collected: 08/29/18 16:20 Received: 08/30/18 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		08/29/18 16:20		
Collected Date	**08/29/2018**				1		08/29/18 16:20		
Collected Time	**1620**				1		08/29/18 16:20		
Field pH	**7.22**	Std. Units	0.10	0.050	1		08/29/18 16:20		
Field Temperature	**13.7**	deg C	0.50	0.25	1		08/29/18 16:20		
Field Specific Conductance	**2123**	umhos/cm	1.0	1.0	1		08/29/18 16:20		
Oxygen, Dissolved	**0.16**	mg/L			1		08/29/18 16:20	7782-44-7	
Turbidity	**55.94**	NTU	1.0	1.0	1		08/29/18 16:20		
Groundwater Elevation	**657.82**	feet			1		08/29/18 16:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**3680**	mg/L	5.0	5.0	1		09/04/18 11:23		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**7.1**	Std. Units	0.10	0.10	1		09/05/18 12:19		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**375**	mg/L	50.0	23.1	50		09/09/18 12:33	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.063	1		09/08/18 10:08	16984-48-8	
Sulfate	**185**	mg/L	50.0	11.8	50		09/09/18 12:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: OGS
Pace Project No.: 60279237

Sample: FIELD BLANK **Lab ID: 60279237005** Collected: 08/29/18 16:15 Received: 08/30/18 09:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**7.0**	mg/L	5.0	5.0	1		09/04/18 11:23		D6
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B								
pH at 25 Degrees C	**5.5**	Std. Units	0.10	0.10	1		09/05/18 12:17		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**<0.46**	mg/L	1.0	0.46	1		09/08/18 10:22	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		09/08/18 10:22	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		09/08/18 10:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: OGS
Pace Project No.: 60279237

QC Batch: 542824 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60279237001, 60279237002, 60279237003, 60279237004, 60279237005

METHOD BLANK: 2224274 Matrix: Water
Associated Lab Samples: 60279237001, 60279237002, 60279237003, 60279237004, 60279237005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	5.0	09/04/18 11:23	

LABORATORY CONTROL SAMPLE: 2224275

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1020	102	80-120	

SAMPLE DUPLICATE: 2224276

Parameter	Units	60279237005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	7.0	6.0	15	10	D6

SAMPLE DUPLICATE: 2224278

Parameter	Units	60279221006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2190	2130	3	10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: OGS
Pace Project No.: 60279237

QC Batch: 543029 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60279237001, 60279237002, 60279237003, 60279237004, 60279237005

SAMPLE DUPLICATE: 2225012

Parameter	Units	60279029001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.9	5.9	0	5	H6

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: OGS
Pace Project No.: 60279237

QC Batch: 543544 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60279237002, 60279237003, 60279237004, 60279237005

METHOD BLANK: 2227484 Matrix: Water
Associated Lab Samples: 60279237002, 60279237003, 60279237004, 60279237005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.46	09/08/18 07:24	
Fluoride	mg/L	0.13J	0.20	0.063	09/08/18 07:24	
Sulfate	mg/L	ND	1.0	0.24	09/08/18 07:24	

LABORATORY CONTROL SAMPLE: 2227485

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	80-120	
Fluoride	mg/L	2.5	2.7	109	80-120	
Sulfate	mg/L	5	5.0	101	80-120	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: OGS
Pace Project No.: 60279237

QC Batch: 543591 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60279237001, 60279237002, 60279237003, 60279237004

METHOD BLANK: 2227824 Matrix: Water
Associated Lab Samples: 60279237001, 60279237002, 60279237003, 60279237004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.46	09/09/18 09:42	
Fluoride	mg/L	ND	0.20	0.063	09/09/18 09:42	
Sulfate	mg/L	ND	1.0	0.24	09/09/18 09:42	

LABORATORY CONTROL SAMPLE: 2227825

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	80-120	
Fluoride	mg/L	2.5	2.4	96	80-120	
Sulfate	mg/L	5	4.9	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2227826 2227827

Parameter	Units	60279854001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.7	5	5	17.2	17.2	111	109	80-120	0	15	
Fluoride	mg/L	1.1	2.5	2.5	3.6	3.6	101	100	80-120	0	15	
Sulfate	mg/L	6.3	5	5	11.6	11.6	107	107	80-120	0	15	

SAMPLE DUPLICATE: 2227828

Parameter	Units	60279854002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	23.2	23.2	0	15	
Fluoride	mg/L	1.7	1.7	0	15	
Sulfate	mg/L	6.9	6.9	0	15	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: OGS
Pace Project No.: 60279237

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

WORKORDER QUALIFIERS

WO: 60279237

[1]	Rev.2 9/12/2018
[2]	Revised report to include client collected field data, Added J-flags to Field Blank result

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OGS
Pace Project No.: 60279237

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60279237001	**MW 301**		543966		
60279237002	**MW 302**		543966		
60279237003	**MW 303**		543966		
60279237004	**MW 304**		543966		
60279237001	**MW 301**	SM 2540C	542824		
60279237002	**MW 302**	SM 2540C	542824		
60279237003	**MW 303**	SM 2540C	542824		
60279237004	**MW 304**	SM 2540C	542824		
60279237005	**FIELD BLANK**	SM 2540C	542824		
60279237001	**MW 301**	SM 4500-H+B	543029		
60279237002	**MW 302**	SM 4500-H+B	543029		
60279237003	**MW 303**	SM 4500-H+B	543029		
60279237004	**MW 304**	SM 4500-H+B	543029		
60279237005	**FIELD BLANK**	SM 4500-H+B	543029		
60279237001	**MW 301**	EPA 9056	543591		
60279237002	**MW 302**	EPA 9056	543544		
60279237002	**MW 302**	EPA 9056	543591		
60279237003	**MW 303**	EPA 9056	543544		
60279237003	**MW 303**	EPA 9056	543591		
60279237004	**MW 304**	EPA 9056	543544		
60279237004	**MW 304**	EPA 9056	543591		
60279237005	**FIELD BLANK**	EPA 9056	543544		

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Sample Condition Upon Receipt

WO# : 60279237

60279237

Client Name: SCS

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7825 4275 7648 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☐ No ☑ Seals intact: Yes ☑ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☑ xpic

Thermometer Used: T299 **Type of Ice:** Wet ☑ Blue None

Cooler Temperature (°C): As-read 0.1 Corr. Factor +0.1 Corrected 0.2

Date and initials of person examining contents: 8.30.18 HK HF

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☑Yes ☐No ☐N/A	ph
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☑No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☐Yes ☐No ☑N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

REVIEWED
By Hank Kapka at 9:49 am, 8/31/18

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

Page 1 of

60279237

CHAIN OF CUSTODY

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

(Please Print Clearly)	
Company Name:	SCS
Branch/Location:	Madison
Project Contact:	Meg Blodgett
Phone:	608-216-7362
Project Number:	25216072.18
Project Name:	OGS
Project State:	Iowa
Sampled By (Print):	Paul A. Grover
Sampled By (Sign):	Paul A. Grover
PO #:	Regulatory Program:

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

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

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

Matrix Codes

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

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

PACE LAB #	CLIENT FIELD ID	COLLECTION DATE	COLLECTION TIME	MATRIX	Y/N	Pick Letter	Analyses Requested: CHF, PH, SO4, TDS	CLIENT COMMENTS	LAB COMMENTS (Lab Use Only)	Profile #
	MW 301	8/29/18	13:45	GW	N	I	X	BP2U		001
	MW 302	↓	14:30	↓			X	↓		002
	MW 303		15:20				X			003
	MW 304		16:20	↓			X			004
	Field Blank	↓	16:15	DI			X			005

Rush Turnaround Time Requested - Prelims (Rush TAT subject to approval/surcharge) Date Needed:	Relinquished By:	Date/Time:	Received By:	Date/Time:	PACE Project No.
	Paul A. Grover	8/29/18 18:30	Holly Fowler pdsi	8.30.18 0930	
Transmit Prelim Rush Results by (complete what you want):	Relinquished By:	Date/Time:	Received By:	Date/Time:	Receipt Temp = 0.2 °C
Email #1:	Relinquished By:	Date/Time:	Received By:	Date/Time:	Sample Receipt pH OK / Adjusted
Email #2:	Relinquished By:	Date/Time:	Received By:	Date/Time:	Cooler Custody Seal Present / Not Present Intact / Not Intact
Telephone:	Relinquished By:	Date/Time:	Received By:	Date/Time:	
Fax:					
Samples on HOLD are subject to special pricing and release of liability					

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Version 6.0 06/14/06

C019a(27Jun2006)

ORIGINAL

A4 Assessment Monitoring Semiannual, October 2018

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 05, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

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SAMPLE SUMMARY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60284241001	**MW-301**	Water	10/16/18 11:15	10/18/18 09:00
60284241002	**MW-302**	Water	10/16/18 12:15	10/18/18 09:00
60284241003	**MW-303**	Water	10/16/18 13:17	10/18/18 09:00
60284241004	**MW-304**	Water	10/16/18 14:10	10/18/18 09:00
60284241005	**MW-305**	Water	10/16/18 14:40	10/18/18 09:00
60284241006	**MW-306**	Water	10/16/18 15:00	10/18/18 09:00
60284241007	**FIELD BLANK**	Water	10/16/18 15:15	10/18/18 09:00

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SAMPLE ANALYTE COUNT

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60284241001	**MW-301**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60284241002	**MW-302**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	WNM	3	PASI-K
60284241003	**MW-303**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284241004	**MW-304**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284241005	**MW-305**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284241006	**MW-306**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	LDB, WNM	3	PASI-K
60284241007	**FIELD BLANK**	EPA 6010	EMR	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 9040	RMT	1	PASI-K
		EPA 9056	WNM	3	PASI-K

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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-301 **Lab ID: 60284241001** Collected: 10/16/18 11:15 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 11:15		
Collected Date	**10/16/2018**				1		10/16/18 11:15		
Collected Time	**11:15**				1		10/16/18 11:15		
Field pH	**6.27**	Std. Units	0.10	0.050	1		10/16/18 11:15		
Field Temperature	**16.6**	deg C	0.50	0.25	1		10/16/18 11:15		
Field Specific Conductance	**599**	umhos/cm	1.0	1.0	1		10/16/18 11:15		
Oxygen, Dissolved	**4.12**	mg/L			1		10/16/18 11:15	7782-44-7	
REDOX	**119.7**	mV			1		10/16/18 11:15		
Turbidity	**2.91**	NTU	1.0	1.0	1		10/16/18 11:15		
Groundwater Elevation	**682.50**	feet			1		10/16/18 11:15		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**410**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 19:48	7440-42-8	
Calcium	**47.2**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 19:48	7440-70-2	
Lithium	**19.4**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 19:48	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.078**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:23	7440-36-0	
Arsenic	**0.16J**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:23	7440-38-2	
Barium	**28.1**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:23	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:23	7440-41-7	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:23	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:23	7440-47-3	B
Cobalt	**0.36J**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:23	7440-48-4	B
Lead	**<0.13**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:23	7439-92-1	
Molybdenum	**0.72J**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:23	7439-98-7	
Selenium	**3.4**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:23	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:23	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**392**	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH	Analytical Method: EPA 9040								
pH	**6.6**	Std. Units	0.10	0.10	1		10/24/18 16:36		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**33.9**	mg/L	5.0	1.4	5		10/28/18 02:24	16887-00-6	
Fluoride	**0.30**	mg/L	0.20	0.19	1		10/28/18 03:30	16984-48-8	
Sulfate	**164**	mg/L	50.0	12.0	50		10/28/18 02:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-302 **Lab ID: 60284241002** Collected: 10/16/18 12:15 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 12:14		
Collected Date	**10/16/2018**				1		10/16/18 12:14		
Collected Time	**12:14**				1		10/16/18 12:14		
Field pH	**6.37**	Std. Units	0.10	0.050	1		10/16/18 12:14		
Field Temperature	**14.1**	deg C	0.50	0.25	1		10/16/18 12:14		
Field Specific Conductance	**1,912**	umhos/cm	1.0	1.0	1		10/16/18 12:14		
Oxygen, Dissolved	**0.26**	mg/L			1		10/16/18 12:14	7782-44-7	
REDOX	**114.2**	mV			1		10/16/18 12:14		
Turbidity	**88.24**	NTU	1.0	1.0	1		10/16/18 12:14		
Groundwater Elevation	**656.91**	feet			1		10/16/18 12:14		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**1100**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 19:50	7440-42-8	
Calcium	**146**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 19:50	7440-70-2	
Lithium	**8.6J**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 19:50	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.26J**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:25	7440-36-0	B
Arsenic	**1.9**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:25	7440-38-2	
Barium	**28.9**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:25	7440-39-3	
Beryllium	**0.22J**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:25	7440-41-7	
Cadmium	**0.67**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:25	7440-43-9	
Chromium	**1.6**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:25	7440-47-3	
Cobalt	**4.0**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:25	7440-48-4	
Lead	**3.9**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:25	7439-92-1	
Molybdenum	**<0.57**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:25	7439-98-7	
Selenium	**0.84J**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:25	7782-49-2	B
Thallium	**0.16J**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:25	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1400**	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH	Analytical Method: EPA 9040								
pH	**6.6**	Std. Units	0.10	0.10	1		10/24/18 16:37		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**214**	mg/L	50.0	14.5	50		10/28/18 03:28	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.19	1		10/28/18 03:44	16984-48-8	
Sulfate	**785**	mg/L	50.0	12.0	50		10/28/18 03:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-303 **Lab ID: 60284241003** Collected: 10/16/18 13:17 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 13:16		
Collected Date	**10/16/2018**				1		10/16/18 13:16		
Collected Time	**13:16**				1		10/16/18 13:16		
Field pH	**6.66**	Std. Units	0.10	0.050	1		10/16/18 13:16		
Field Temperature	**17.1**	deg C	0.50	0.25	1		10/16/18 13:16		
Field Specific Conductance	**1,573**	umhos/cm	1.0	1.0	1		10/16/18 13:16		
Oxygen, Dissolved	**0.29**	mg/L			1		10/16/18 13:16	7782-44-7	
REDOX	**32.8**	mV			1		10/16/18 13:16		
Turbidity	**5.99**	NTU	1.0	1.0	1		10/16/18 13:16		
Groundwater Elevation	**656.17**	feet			1		10/16/18 13:16		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**549**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 19:52	7440-42-8	
Calcium	**195**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 19:52	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 19:52	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**0.20J**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:27	7440-36-0	B
Arsenic	**0.55J**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:27	7440-38-2	
Barium	**95.2**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:27	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:27	7440-41-7	
Cadmium	**0.24J**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:27	7440-43-9	
Chromium	**0.15J**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:27	7440-47-3	B
Cobalt	**1.7**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:27	7440-48-4	B
Lead	**<0.13**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:27	7439-92-1	
Molybdenum	**5.5**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:27	7439-98-7	
Selenium	**0.37J**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:27	7782-49-2	B
Thallium	**<0.099**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:27	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1150**	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH	Analytical Method: EPA 9040								
pH	**6.9**	Std. Units	0.10	0.10	1		10/24/18 16:38		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**57.0**	mg/L	10.0	2.9	10		10/29/18 00:20	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.19	1		10/28/18 03:58	16984-48-8	
Sulfate	**389**	mg/L	50.0	12.0	50		10/29/18 01:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-304 **Lab ID: 60284241004** Collected: 10/16/18 14:10 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 14:10		
Collected Date	**10/16/2018**				1		10/16/18 14:10		
Collected Time	**14:10**				1		10/16/18 14:10		
Field pH	**6.86**	Std. Units	0.10	0.050	1		10/16/18 14:10		
Field Temperature	**13.5**	deg C	0.50	0.25	1		10/16/18 14:10		
Field Specific Conductance	**2,058**	umhos/cm	1.0	1.0	1		10/16/18 14:10		
Oxygen, Dissolved	**0.11**	mg/L			1		10/16/18 14:10	7782-44-7	
REDOX	**-114.5**	mV			1		10/16/18 14:10		
Turbidity	**17.12**	NTU	1.0	1.0	1		10/16/18 14:10		
Groundwater Elevation	**658.2**	feet			1		10/16/18 14:10		
6010 MET ICP	Analytical Method: EPA 6010	Preparation Method: EPA 3010							
Boron	**930**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 19:59	7440-42-8	
Calcium	**123**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 19:59	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 19:59	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020	Preparation Method: EPA 3010							
Antimony	**<0.078**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:29	7440-36-0	
Arsenic	**0.96J**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:29	7440-38-2	
Barium	**91.0**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:29	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:29	7440-41-7	
Cadmium	**0.073J**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:29	7440-43-9	
Chromium	**1.4**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:29	7440-47-3	
Cobalt	**0.45J**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:29	7440-48-4	B
Lead	**0.66J**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:29	7439-92-1	
Molybdenum	**1.9**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:29	7439-98-7	
Selenium	**0.26J**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:29	7782-49-2	B
Thallium	**<0.099**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:29	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1180**	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH	Analytical Method: EPA 9040								
pH	**7.0**	Std. Units	0.10	0.10	1		10/24/18 16:41		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**410**	mg/L	50.0	14.5	50		10/29/18 01:25	16887-00-6	
Fluoride	**1.0**	mg/L	0.20	0.19	1		10/28/18 04:13	16984-48-8	
Sulfate	**184**	mg/L	50.0	12.0	50		10/29/18 01:25	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-305 **Lab ID: 60284241005** Collected: 10/16/18 14:40 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 14:39		
Collected Date	**10/16/2018**				1		10/16/18 14:39		
Collected Time	**14:39**				1		10/16/18 14:39		
Field pH	**6.86**	Std. Units	0.10	0.050	1		10/16/18 14:39		
Field Temperature	**13.9**	deg C	0.50	0.25	1		10/16/18 14:39		
Field Specific Conductance	**1,836**	umhos/cm	1.0	1.0	1		10/16/18 14:39		
Oxygen, Dissolved	**0.09**	mg/L			1		10/16/18 14:39	7782-44-7	
REDOX	**-26.8**	mV			1		10/16/18 14:39		
Turbidity	**6.96**	NTU	1.0	1.0	1		10/16/18 14:39		
Groundwater Elevation	**663.37**	feet			1		10/16/18 14:39		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**835**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 20:01	7440-42-8	
Calcium	**96.2**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 20:01	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 20:01	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.096J**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:31	7440-36-0	B
Arsenic	**0.66J**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:31	7440-38-2	
Barium	**125**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:31	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:31	7440-41-7	
Cadmium	**0.044J**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:31	7440-43-9	
Chromium	**0.30J**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:31	7440-47-3	B
Cobalt	**17.2**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:31	7440-48-4	
Lead	**<0.13**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:31	7439-92-1	
Molybdenum	**7.3**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:31	7439-98-7	
Selenium	**0.33J**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:31	7782-49-2	B
Thallium	**0.33J**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:31	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1070**	mg/L	5.0	5.0	1		10/22/18 16:08		
9040 pH	Analytical Method: EPA 9040								
pH	**7.1**	Std. Units	0.10	0.10	1		10/24/18 16:43		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**281**	mg/L	25.0	7.2	25		10/29/18 01:42	16887-00-6	
Fluoride	**0.40**	mg/L	0.20	0.19	1		10/28/18 04:27	16984-48-8	
Sulfate	**129**	mg/L	25.0	6.0	25		10/29/18 01:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: MW-306 **Lab ID: 60284241006** Collected: 10/16/18 15:00 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		10/16/18 15:00		
Collected Date	**10/16/2018**				1		10/16/18 15:00		
Collected Time	**15:00**				1		10/16/18 15:00		
Field pH	**6.42**	Std. Units	0.10	0.050	1		10/16/18 15:00		
Field Temperature	**13.4**	deg C	0.50	0.25	1		10/16/18 15:00		
Field Specific Conductance	**1,340**	umhos/cm	1.0	1.0	1		10/16/18 15:00		
Oxygen, Dissolved	**0.08**	mg/L			1		10/16/18 15:00	7782-44-7	
REDOX	**13.3**	mV			1		10/16/18 15:00		
Turbidity	**7.07**	NTU	1.0	1.0	1		10/16/18 15:00		
Groundwater Elevation	**670.24**	feet			1		10/16/18 15:00		
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**862**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 20:04	7440-42-8	
Calcium	**80.0**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 20:04	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 20:04	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**0.10J**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:33	7440-36-0	B
Arsenic	**0.60J**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:33	7440-38-2	
Barium	**56.0**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:33	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:33	7440-41-7	
Cadmium	**0.96**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:33	7440-43-9	
Chromium	**0.46J**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:33	7440-47-3	B
Cobalt	**6.4**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:33	7440-48-4	
Lead	**<0.13**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:33	7439-92-1	
Molybdenum	**5.1**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:33	7439-98-7	
Selenium	**0.22J**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:33	7782-49-2	B
Thallium	**0.12J**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:33	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**884**	mg/L	5.0	5.0	1		10/22/18 16:10		
9040 pH	Analytical Method: EPA 9040								
pH	**6.7**	Std. Units	0.10	0.10	1		10/24/18 16:44		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**83.3**	mg/L	10.0	2.9	10		10/29/18 01:58	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		10/28/18 04:41	16984-48-8	
Sulfate	**285**	mg/L	50.0	12.0	50		10/29/18 02:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Sample: FIELD BLANK **Lab ID: 60284241007** Collected: 10/16/18 15:15 Received: 10/18/18 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010								
Boron	**<12.5**	ug/L	100	12.5	1	10/23/18 14:00	10/24/18 20:06	7440-42-8	
Calcium	**<0.054**	mg/L	0.20	0.054	1	10/23/18 14:00	10/24/18 20:06	7440-70-2	
Lithium	**<4.6**	ug/L	10.0	4.6	1	10/23/18 14:00	10/24/18 20:06	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Antimony	**<0.078**	ug/L	1.0	0.078	1	10/31/18 15:27	11/01/18 19:41	7440-36-0	
Arsenic	**<0.065**	ug/L	1.0	0.065	1	10/31/18 15:27	11/01/18 19:41	7440-38-2	
Barium	**<0.28**	ug/L	1.0	0.28	1	10/31/18 15:27	11/01/18 19:41	7440-39-3	
Beryllium	**<0.089**	ug/L	0.50	0.089	1	10/31/18 15:27	11/01/18 19:41	7440-41-7	
Cadmium	**<0.033**	ug/L	0.50	0.033	1	10/31/18 15:27	11/01/18 19:41	7440-43-9	
Chromium	**<0.079**	ug/L	1.0	0.079	1	10/31/18 15:27	11/01/18 19:41	7440-47-3	
Cobalt	**<0.062**	ug/L	1.0	0.062	1	10/31/18 15:27	11/01/18 19:41	7440-48-4	
Lead	**<0.13**	ug/L	1.0	0.13	1	10/31/18 15:27	11/01/18 19:41	7439-92-1	
Molybdenum	**<0.57**	ug/L	1.0	0.57	1	10/31/18 15:27	11/01/18 19:41	7439-98-7	
Selenium	**<0.085**	ug/L	1.0	0.085	1	10/31/18 15:27	11/01/18 19:41	7782-49-2	
Thallium	**<0.099**	ug/L	1.0	0.099	1	10/31/18 15:27	11/01/18 19:41	7440-28-0	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**5.5**	mg/L	5.0	5.0	1		10/22/18 16:10		
9040 pH	Analytical Method: EPA 9040								
pH	**6.0**	Std. Units	0.10	0.10	1		10/24/18 16:46		H6
9056 IC Anions	Analytical Method: EPA 9056								
Chloride	**<0.29**	mg/L	1.0	0.29	1		10/28/18 04:55	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		10/28/18 04:55	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		10/28/18 04:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 551098 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

METHOD BLANK: 2260108 Matrix: Water
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	10/24/18 19:46	
Calcium	mg/L	<0.054	0.20	0.054	10/24/18 19:46	
Lithium	ug/L	<4.6	10.0	4.6	10/24/18 19:46	

LABORATORY CONTROL SAMPLE: 2260109

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	928	93	80-120	
Calcium	mg/L	10	9.6	96	80-120	
Lithium	ug/L	1000	957	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2260110 2260111

Parameter	Units	60283591002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1020	1000	1000	1940	1930	93	92	75-125	1	20	
Calcium	mg/L	443000 ug/L	10	10	447	447	42	39	75-125	0	20	M1
Lithium	ug/L	233	1000	1000	1180	1180	95	94	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2260112 2260113

Parameter	Units	60283591003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	528	1000	1000	1460	1430	93	90	75-125	2	20	
Calcium	mg/L	135000 ug/L	10	10	142	142	72	72	75-125	0	20	M1
Lithium	ug/L	177	1000	1000	1100	1090	92	91	75-125	1	20	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 552660 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

METHOD BLANK: 2266473 Matrix: Water
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.11J	1.0	0.078	11/01/18 18:50	
Arsenic	ug/L	<0.065	1.0	0.065	11/04/18 15:59	
Barium	ug/L	<0.28	1.0	0.28	11/04/18 15:59	
Beryllium	ug/L	<0.089	0.50	0.089	11/01/18 18:50	
Cadmium	ug/L	<0.033	0.50	0.033	11/04/18 15:59	
Chromium	ug/L	0.082J	1.0	0.079	11/01/18 18:50	
Cobalt	ug/L	0.20J	1.0	0.062	11/01/18 18:50	
Lead	ug/L	<0.13	1.0	0.13	11/04/18 15:59	
Molybdenum	ug/L	<0.57	1.0	0.57	11/01/18 18:50	
Selenium	ug/L	0.20J	1.0	0.085	11/01/18 18:50	
Thallium	ug/L	<0.099	1.0	0.099	11/01/18 18:50	

LABORATORY CONTROL SAMPLE: 2266474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	42.4	106	80-120	
Arsenic	ug/L	40	43.3	108	80-120	
Barium	ug/L	40	41.4	104	80-120	
Beryllium	ug/L	40	41.2	103	80-120	
Cadmium	ug/L	40	36.6	92	80-120	
Chromium	ug/L	40	40.7	102	80-120	
Cobalt	ug/L	40	41.2	103	80-120	
Lead	ug/L	40	35.7	89	80-120	
Molybdenum	ug/L	40	42.6	106	80-120	
Selenium	ug/L	40	42.1	105	80-120	
Thallium	ug/L	40	38.7	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2266475 2266476

Parameter	Units	60284062002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.078	40	40	39.7	39.7	99	99	75-125	0	20	
Arsenic	ug/L	0.44J	40	40	43.1	43.1	107	107	75-125	0	20	
Barium	ug/L	143	40	40	186	188	107	112	75-125	1	20	
Beryllium	ug/L	<0.089	40	40	37.4	37.7	94	94	75-125	1	20	
Cadmium	ug/L	<0.033	40	40	35.6	35.8	89	90	75-125	1	20	
Chromium	ug/L	0.27J	40	40	37.0	37.7	92	94	75-125	2	20	
Cobalt	ug/L	0.15J	40	40	37.8	38.0	94	95	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2266475 2266476

Parameter	Units	60284062002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	<0.13	40	40	33.9	33.9	85	85	75-125	0	20	
Molybdenum	ug/L	<0.57	40	40	43.1	43.2	107	107	75-125	0	20	
Selenium	ug/L	<0.085	40	40	38.5	38.4	96	96	75-125	0	20	
Thallium	ug/L	<0.099	40	40	33.7	33.6	84	84	75-125	0	20	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 550935 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

METHOD BLANK: 2259350 Matrix: Water
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	10/22/18 16:06	

LABORATORY CONTROL SAMPLE: 2259351

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120	

SAMPLE DUPLICATE: 2259352

Parameter	Units	60284115001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5420	5430	0	10	

SAMPLE DUPLICATE: 2259353

Parameter	Units	60284115002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8.0	5.5	37	10	D6

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 551115 Analysis Method: EPA 9040
QC Batch Method: EPA 9040 Analysis Description: 9040 pH
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

SAMPLE DUPLICATE: 2260274

Parameter	Units	60284061002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH	Std. Units	7.5	7.5	1	10	H6

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 551837 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60284241001, 60284241002

METHOD BLANK: 2263033 Matrix: Water
Associated Lab Samples: 60284241001, 60284241002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/27/18 11:47	
Sulfate	mg/L	<0.24	1.0	0.24	10/27/18 11:47	

LABORATORY CONTROL SAMPLE: 2263034

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2263035 2263036

Parameter	Units	60283868001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.8	5	5	6.0	7.1	85	106	80-120	16	15	R1
Sulfate	mg/L	3.7	5	5	8.1	9.3	88	113	80-120	15	15	

SAMPLE DUPLICATE: 2263037

Parameter	Units	2086025002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6480	6600	2	15	
Sulfate	mg/L	1240	1260	2	15	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 552042 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

METHOD BLANK: 2264261 Matrix: Water
Associated Lab Samples: 60284241001, 60284241002, 60284241003, 60284241004, 60284241005, 60284241006, 60284241007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/28/18 00:25	
Fluoride	mg/L	<0.19	0.20	0.19	10/28/18 00:25	
Sulfate	mg/L	<0.24	1.0	0.24	10/28/18 00:25	

LABORATORY CONTROL SAMPLE: 2264262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	80-120	
Fluoride	mg/L	2.5	2.6	104	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

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QUALITY CONTROL DATA

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

QC Batch: 552047 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60284241003, 60284241004, 60284241005, 60284241006

METHOD BLANK: 2264280 Matrix: Water
Associated Lab Samples: 60284241003, 60284241004, 60284241005, 60284241006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	10/28/18 21:52	
Sulfate	mg/L	<0.24	1.0	0.24	10/28/18 21:52	

LABORATORY CONTROL SAMPLE: 2264281

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Sulfate	mg/L	5	4.8	97	80-120	

SAMPLE DUPLICATE: 2264284

Parameter	Units	60284062001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	293	238	21	15	D6

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60284241001	**MW-301**		551588		
60284241002	**MW-302**		551588		
60284241003	**MW-303**		551588		
60284241004	**MW-304**		551588		
60284241005	**MW-305**		551588		
60284241006	**MW-306**		551588		
60284241001	**MW-301**	EPA 3010	551098	EPA 6010	551203
60284241002	**MW-302**	EPA 3010	551098	EPA 6010	551203
60284241003	**MW-303**	EPA 3010	551098	EPA 6010	551203
60284241004	**MW-304**	EPA 3010	551098	EPA 6010	551203
60284241005	**MW-305**	EPA 3010	551098	EPA 6010	551203
60284241006	**MW-306**	EPA 3010	551098	EPA 6010	551203
60284241007	**FIELD BLANK**	EPA 3010	551098	EPA 6010	551203
60284241001	**MW-301**	EPA 3010	552660	EPA 6020	552780
60284241002	**MW-302**	EPA 3010	552660	EPA 6020	552780
60284241003	**MW-303**	EPA 3010	552660	EPA 6020	552780
60284241004	**MW-304**	EPA 3010	552660	EPA 6020	552780
60284241005	**MW-305**	EPA 3010	552660	EPA 6020	552780
60284241006	**MW-306**	EPA 3010	552660	EPA 6020	552780
60284241007	**FIELD BLANK**	EPA 3010	552660	EPA 6020	552780
60284241001	**MW-301**	SM 2540C	550935		
60284241002	**MW-302**	SM 2540C	550935		
60284241003	**MW-303**	SM 2540C	550935		
60284241004	**MW-304**	SM 2540C	550935		
60284241005	**MW-305**	SM 2540C	550935		
60284241006	**MW-306**	SM 2540C	550935		
60284241007	**FIELD BLANK**	SM 2540C	550935		
60284241001	**MW-301**	EPA 9040	551115		
60284241002	**MW-302**	EPA 9040	551115		
60284241003	**MW-303**	EPA 9040	551115		
60284241004	**MW-304**	EPA 9040	551115		
60284241005	**MW-305**	EPA 9040	551115		
60284241006	**MW-306**	EPA 9040	551115		
60284241007	**FIELD BLANK**	EPA 9040	551115		
60284241001	**MW-301**	EPA 9056	551837		
60284241001	**MW-301**	EPA 9056	552042		
60284241002	**MW-302**	EPA 9056	551837		
60284241002	**MW-302**	EPA 9056	552042		
60284241003	**MW-303**	EPA 9056	552042		
60284241003	**MW-303**	EPA 9056	552047		
60284241004	**MW-304**	EPA 9056	552042		
60284241004	**MW-304**	EPA 9056	552047		
60284241005	**MW-305**	EPA 9056	552042		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284241

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60284241005	**MW-305**	EPA 9056	552047		
60284241006	**MW-306**	EPA 9056	552042		
60284241006	**MW-306**	EPA 9056	552047		
60284241007	**FIELD BLANK**	EPA 9056	552042		

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Sample Condition Upon Receipt

WO# : 60284241

60284241

Client Name: SCS Engineers

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 4542 2783 6495 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-297 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.1 **Corr. Factor** -0.2 **Corrected** 1.9

Date and initials of person examining contents: HK 10/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☐Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☒Yes ☐No ☐N/A	pH
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☒No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☒No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Hank
04:52 pm,Oct 19,2018
Kapka

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

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Page: of

Section A Required Client Information:

Company:	SCS Engineers
Address:	2830 Dairy Drive
	Madison WI 53718
Email To:	mblodgett@scsengineers.com
Phone: 608-216-7362	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Generating Station
Project Number:	25216072.18

Section C Invoice Information:

Attention:	Meghan Blodgett/Jess Valcheff
Company Name:	SCS Engineers
Address:	
Pace Quote Reference:	
Pace Project Manager:	Hank Kapka 913-563-1404
Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Hg	9056 Chloride-Fluoride-Sulfate	2540C TDS	9040 pH							Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N										
1	MW-301	WT	G	xxx	xxx	10/16/18	11:15	16.4	3	1		2							X	X	X	X	X	X	BP2U	2BP3N					6021184241 001
2	MW-302	WT	G	xxx	xxx		12:15	14.1	3	1		2							X	X	X	X	X	X								002
3	MW-303	WT	G	xxx	xxx		13:17	17.1	3	1		2							X	X	X	X	X	X								003
4	MW-304	WT	G	xxx	xxx		14:10	13.5	3	1		2							X	X	X	X	X	X								004
5	MW-305	WT	G	xxx	xxx		14:40	13.7	3	1		2							X	X	X	X	X	X								005
6	MW-306	WT	G	xxx	xxx		15:00	13.4	3	1		2							X	X	X	X	X	X								006
7	FIELD BLANK	WT	G	xxx	xxx		15:15	—	3	1		2							X	X	X	X	X	X								007
8																																
9																																
10																																
11																																
12																																

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Grover	10/17/18	16:30	pasl	10/18/19	09:00	1.9	4	4	4
* Sb-As-Ba-Be-Cd-Cr-Co-Pb-Mo-Se-Tl										

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Paul A. Grover					
SIGNATURE of SAMPLER:	Paul A. Grover	DATE Signed (MM/DD/YY): 10/17/18				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-Feb-2007

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

November 05, 2018

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on October 18, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

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CERTIFICATIONS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

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SAMPLE SUMMARY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60284212001	**MW-301**	Water	10/16/18 11:15	10/18/18 09:00
60284212002	**MW-302**	Water	10/16/18 12:15	10/18/18 09:00
60284212003	**MW-303**	Water	10/16/18 13:17	10/18/18 09:00
60284212004	**MW-304**	Water	10/16/18 14:10	10/18/18 09:00
60284212005	**MW-305**	Water	10/16/18 14:40	10/18/18 09:00
60284212006	**MW-306**	Water	10/16/18 15:00	10/18/18 09:00
60284212007	**FIELD BLANK**	Water	10/16/18 15:15	10/18/18 09:00

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SAMPLE ANALYTE COUNT

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60284212001	**MW-301**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212002	**MW-302**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212003	**MW-303**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212004	**MW-304**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212005	**MW-305**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212006	**MW-306**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60284212007	**FIELD BLANK**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-301 **Lab ID: 60284212001** Collected: 10/16/18 11:15 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.529 ± 0.610 (0.992) C:NA T:86%**	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	**0.627 ± 0.376 (0.703) C:82% T:85%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**1.16 ± 0.986 (1.70)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-302 **Lab ID: 60284212002** Collected: 10/16/18 12:15 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.191 ± 0.485 (0.900) C:NA T:90%**	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	**0.108 ± 0.358 (0.804) C:78% T:84%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**0.299 ± 0.843 (1.70)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-303 **Lab ID: 60284212003** Collected: 10/16/18 13:17 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.478 ± 0.586 (0.962) C:NA T:87%**	pCi/L	11/01/18 10:34	13982-63-3	
Radium-228	EPA 904.0	**1.56 ± 0.522 (0.714) C:80% T:80%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**2.04 ± 1.11 (1.68)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-304 **Lab ID: 60284212004** Collected: 10/16/18 14:10 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.21 ± 0.596 (0.560) C:NA T:98%**	pCi/L	11/01/18 10:50	13982-63-3	
Radium-228	EPA 904.0	**1.55 ± 0.507 (0.691) C:80% T:88%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**2.76 ± 1.10 (1.25)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-305 **Lab ID: 60284212005** Collected: 10/16/18 14:40 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.635 ± 0.471 (0.590) C:NA T:93%**	pCi/L	11/01/18 10:50	13982-63-3	
Radium-228	EPA 904.0	**0.921 ± 0.429 (0.728) C:75% T:84%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**1.56 ± 0.900 (1.32)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: MW-306 **Lab ID: 60284212006** Collected: 10/16/18 15:00 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.263 ± 0.366 (0.611) C:NA T:93%**	pCi/L	11/01/18 10:50	13982-63-3	
Radium-228	EPA 904.0	**0.430 ± 0.362 (0.732) C:79% T:89%**	pCi/L	10/31/18 12:29	15262-20-1	
Total Radium	Total Radium Calculation	**0.693 ± 0.728 (1.34)**	pCi/L	11/05/18 15:39	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Sample: FIELD BLANK **Lab ID: 60284212007** Collected: 10/16/18 15:15 Received: 10/18/18 09:00 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.226 ± 0.490 (1.13) C:NA T:82%**	pCi/L	11/01/18 10:50	13982-63-3	
Radium-228	EPA 904.0	**0.175 ± 0.307 (0.672) C:79% T:90%**	pCi/L	10/31/18 12:30	15262-20-1	
Total Radium	Total Radium Calculation	**0.175 ± 0.797 (1.80)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

QC Batch: 317855 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60284212001, 60284212002, 60284212003, 60284212004, 60284212005, 60284212006, 60284212007

METHOD BLANK: 1550520 Matrix: Water
Associated Lab Samples: 60284212001, 60284212002, 60284212003, 60284212004, 60284212005, 60284212006, 60284212007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.00911 ± 0.260 (0.613) C:79% T:81%	pCi/L	10/31/18 12:30	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

QC Batch: 317851 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60284212001, 60284212002, 60284212003, 60284212004, 60284212005, 60284212006, 60284212007

METHOD BLANK: 1550514 Matrix: Water
Associated Lab Samples: 60284212001, 60284212002, 60284212003, 60284212004, 60284212005, 60284212006, 60284212007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.453 ± 0.460 (0.696) C:NA T:92%	pCi/L	11/01/18 10:34	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: OTTUMWA GENERATING STATION
Pace Project No.: 60284212

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60284212001	**MW-301**	EPA 903.1	317851		
60284212002	**MW-302**	EPA 903.1	317851		
60284212003	**MW-303**	EPA 903.1	317851		
60284212004	**MW-304**	EPA 903.1	317851		
60284212005	**MW-305**	EPA 903.1	317851		
60284212006	**MW-306**	EPA 903.1	317851		
60284212007	**FIELD BLANK**	EPA 903.1	317851		
60284212001	**MW-301**	EPA 904.0	317855		
60284212002	**MW-302**	EPA 904.0	317855		
60284212003	**MW-303**	EPA 904.0	317855		
60284212004	**MW-304**	EPA 904.0	317855		
60284212005	**MW-305**	EPA 904.0	317855		
60284212006	**MW-306**	EPA 904.0	317855		
60284212007	**FIELD BLANK**	EPA 904.0	317855		
60284212001	**MW-301**	Total Radium Calculation	319267		
60284212002	**MW-302**	Total Radium Calculation	319267		
60284212003	**MW-303**	Total Radium Calculation	319267		
60284212004	**MW-304**	Total Radium Calculation	319267		
60284212005	**MW-305**	Total Radium Calculation	319267		
60284212006	**MW-306**	Total Radium Calculation	319267		
60284212007	**FIELD BLANK**	Total Radium Calculation	319268		

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Sample Condition Upon Receipt

WO# : 60284212

60284212

Client Name: SCS Engineers

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 4542 2783 1638 1, 1645 1 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☒ Other ☐

Thermometer Used: T-297 **Type of Ice:** Wet Blue (None)

HK

Cooler Temperature (°C): **As-read** 23.0, 24.0 **Corr. Factor** -0.2 **Corrected** 22.8, 23.8

Date and initials of person examining contents: HK 10/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☒No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☒No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: HWK Date: 10-19-2018

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:

Company:	SCS Engineers
Address:	2830 Dairy Drive
	Madison WI 53718
Email To:	mblodgett@scsengineers.com
Phone: 608-216-7362	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	Ottumwa Generating Station
Project Number:	25216072

Section C Invoice Information:

Attention:	Meghan Blodgett/Jess Valcheff
Company Name:	SCS Engineers
Address:	
Pace Quote Reference:	
Pace Project Manager:	Hank Kapka 913-563-1404
Pace Profile #:	6696 Line 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: IA

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	903.1 Radium-226	904.0 Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	10/16/18	11:15	14.4	2			2						X	X	X	28P17		
2	MW-302	WT	G	xxx	xxx		12:15	14.5	2			2						X	X	X			
3	MW-303	WT	G	xxx	xxx		13:17	15.1	2			2						X	X	X			
4	MW-304	WT	G	xxx	xxx		14:10	13.5	2			2						X	X	X			
5	MW-305	WT	G	xxx	xxx		14:40	13.7	2			2						X	X	X			
6	MW-306	WT	G	xxx	xxx		15:00		2			2						X	X	X			
7	Field Blank	WT	G	xxx	xxx	↓	15:15	—	2			2						X	X	X	↓		
8																							
9																							
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	Paul A. Grover SCS	10/17/18	16:40	[signature] Pace	10/18/18	09:00	22.8	N	4	4
							23.8	N	4	4

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Paul A. Grover

SIGNATURE of SAMPLER: Paul A. Grover

DATE Signed (MM/DD/YY): 10/17/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

A5 Assessment Monitoring Semiannual Resample, January 2019

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

January 10, 2019

Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, WI 53718

RE: Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Dear Meghan Blodgett:
Enclosed are the analytical results for sample(s) received by the laboratory on January 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Hank Kapka
hank.kapka@pacelabs.com
(913)599-5665
PM Lab Management

Enclosures

cc: Tom Karwaski, SCS Engineers
Nicole Kron, SCS Engineers
Jeff Maxted, Alliant Energy
Jess Valcheff, SCS Engeineers

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE SUMMARY

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291388001	**MW-301**	Water	01/08/19 09:47	01/09/19 09:00
60291388002	**MW-302**	Water	01/08/19 10:30	01/09/19 09:00
60291388003	**MW-303**	Water	01/08/19 10:51	01/09/19 09:00
60291388004	**MW-304**	Water	01/08/19 11:28	01/09/19 09:00
60291388005	**MW-305**	Water	01/08/19 11:55	01/09/19 09:00
60291388006	**MW-306**	Water	01/08/19 12:24	01/09/19 09:00

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Lenexa, KS 66219
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SAMPLE ANALYTE COUNT

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291388001	**MW-301**	EPA 7470	JDE	1	PASI-K
60291388002	**MW-302**	EPA 7470	JDE	1	PASI-K
60291388003	**MW-303**	EPA 7470	JDE	1	PASI-K
60291388004	**MW-304**	EPA 7470	JDE	1	PASI-K
60291388005	**MW-305**	EPA 7470	JDE	1	PASI-K
60291388006	**MW-306**	EPA 7470	JDE	1	PASI-K

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-301 **Lab ID: 60291388001** Collected: 01/08/19 09:47 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 09:47		
Field pH	**5.68**	Std. Units	0.10	0.050	1		01/08/19 09:47		
Field Temperature	**7.88**	deg C	0.50	0.25	1		01/08/19 09:47		
Field Specific Conductance	**310**	umhos/cm	1.0	1.0	1		01/08/19 09:47		
Field Oxidation Potential	**118.3**	mV			1		01/08/19 09:47		
Oxygen, Dissolved	**5.68**	mg/L			1		01/08/19 09:47	7782-44-7	
Turbidity	**0.77**	NTU	1.0	1.0	1		01/08/19 09:47		
Groundwater Elevation	**682.22**	feet			1		01/08/19 09:47		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:06	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-302 **Lab ID: 60291388002** Collected: 01/08/19 10:30 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 10:30		
Field pH	**6.58**	Std. Units	0.10	0.050	1		01/08/19 10:30		
Field Temperature	**12.21**	deg C	0.50	0.25	1		01/08/19 10:30		
Field Specific Conductance	**1473**	umhos/cm	1.0	1.0	1		01/08/19 10:30		
Field Oxidation Potential	**70.2**	mV			1		01/08/19 10:30		
Oxygen, Dissolved	**6.40**	mg/L			1		01/08/19 10:30	7782-44-7	
Turbidity	**4.39**	NTU	1.0	1.0	1		01/08/19 10:30		
Groundwater Elevation	**656.03**	feet			1		01/08/19 10:30		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:13	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-303 **Lab ID: 60291388003** Collected: 01/08/19 10:51 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 10:51		
Field pH	**6.83**	Std. Units	0.10	0.050	1		01/08/19 10:51		
Field Temperature	**9.11**	deg C	0.50	0.25	1		01/08/19 10:51		
Field Specific Conductance	**750**	umhos/cm	1.0	1.0	1		01/08/19 10:51		
Field Oxidation Potential	**73.7**	mV			1		01/08/19 10:51		
Oxygen, Dissolved	**3.19**	mg/L			1		01/08/19 10:51	7782-44-7	
Turbidity	**14.20**	NTU	1.0	1.0	1		01/08/19 10:51		
Groundwater Elevation	**654.65**	feet			1		01/08/19 10:51		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:15	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-304 **Lab ID: 60291388004** Collected: 01/08/19 11:28 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 11:28		
Field pH	**7.16**	Std. Units	0.10	0.050	1		01/08/19 11:28		
Field Temperature	**12.81**	deg C	0.50	0.25	1		01/08/19 11:28		
Field Specific Conductance	**1368**	umhos/cm	1.0	1.0	1		01/08/19 11:28		
Field Oxidation Potential	**-62.1**	mV			1		01/08/19 11:28		
Oxygen, Dissolved	**0.72**	mg/L			1		01/08/19 11:28	7782-44-7	
Turbidity	**4.38**	NTU	1.0	1.0	1		01/08/19 11:28		
Groundwater Elevation	**656.28**	feet			1		01/08/19 11:28		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:17	7439-97-6	

REPORT OF LABORATORY ANALYSIS

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9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-305 **Lab ID: 60291388005** Collected: 01/08/19 11:55 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 11:55		
Field pH	**6.99**	Std. Units	0.10	0.050	1		01/08/19 11:55		
Field Temperature	**12.43**	deg C	0.50	0.25	1		01/08/19 11:55		
Field Specific Conductance	**1235**	umhos/cm	1.0	1.0	1		01/08/19 11:55		
Field Oxidation Potential	**36.4**	mV			1		01/08/19 11:55		
Oxygen, Dissolved	**0.81**	mg/L			1		01/08/19 11:55	7782-44-7	
Turbidity	**4.76**	NTU	1.0	1.0	1		01/08/19 11:55		
Groundwater Elevation	**662.13**	feet			1		01/08/19 11:55		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:20	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Sample: MW-306 **Lab ID: 60291388006** Collected: 01/08/19 12:24 Received: 01/09/19 09:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Field Data	Analytical Method:								
Collected By	**Client**				1		01/08/19 12:24		
Field pH	**6.65**	Std. Units	0.10	0.050	1		01/08/19 12:24		
Field Temperature	**13.31**	deg C	0.50	0.25	1		01/08/19 12:24		
Field Specific Conductance	**965**	umhos/cm	1.0	1.0	1		01/08/19 12:24		
Field Oxidation Potential	**59.5**	mV			1		01/08/19 12:24		
Oxygen, Dissolved	**0.47**	mg/L			1		01/08/19 12:24	7782-44-7	
Turbidity	**0.89**	NTU	1.0	1.0	1		01/08/19 12:24		
Groundwater Elevation	**669.84**	feet			1		01/08/19 12:24		
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	01/09/19 10:40	01/09/19 14:22	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

QC Batch: 563867 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60291388001, 60291388002, 60291388003, 60291388004, 60291388005, 60291388006

METHOD BLANK: 2313359 Matrix: Water
Associated Lab Samples: 60291388001, 60291388002, 60291388003, 60291388004, 60291388005, 60291388006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	01/09/19 14:01	

LABORATORY CONTROL SAMPLE: 2313360

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2313361 2313362

Parameter	Units	60291388001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.090	5	5	4.8	4.8	97	95	75-125	1	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: IPL - OGS 25216072.18
Pace Project No.: 60291388

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291388001	**MW-301**		563873		
60291388002	**MW-302**		563873		
60291388003	**MW-303**		563873		
60291388004	**MW-304**		563873		
60291388005	**MW-305**		563873		
60291388006	**MW-306**		563873		
60291388001	**MW-301**	EPA 7470	563867	EPA 7470	563942
60291388002	**MW-302**	EPA 7470	563867	EPA 7470	563942
60291388003	**MW-303**	EPA 7470	563867	EPA 7470	563942
60291388004	**MW-304**	EPA 7470	563867	EPA 7470	563942
60291388005	**MW-305**	EPA 7470	563867	EPA 7470	563942
60291388006	**MW-306**	EPA 7470	563867	EPA 7470	563942

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Sample Condition Upon Receipt

WO# : 60291388

60291388

Client Name: SCS Engineers

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 474687395363 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-301 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 0.5 Corr. Factor 0.0 Corrected 0.5

Date and initials of person examining contents: 1/9/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☑Yes ☐No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☑No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☑No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Meghan B Date/Time: 1-9-19 9:50

Comments/ Resolution: Only report Hg & field Data

Project Manager Review: HJK Date: 1-9-2019

* Turn in ASAP *

Pace Analytical www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:

Company:	SCS Engineers
Address:	2830 Dairy Drive
	Madison WI 53718
Email To:	mblodgett@scsengineers.com
Phone:	608-216-7362 Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Meghan Blodgett
Copy To:	Tom Karwaski
Purchase Order No.:	
Project Name:	~~M.L. Kapp Ash Pond~~ IPL - OGS
Project Number:	~~25216001.00.~~ 25216072.18

Section C Invoice Information:

Attention:	Meghan Blodgett/Jess Valcheff
Company Name:	SCS Engineers
Address:	
Pace Quote Reference:	
Pace Project Manager:	Hank Kapka 913-563-1404
Pace Profile #:	6696 Line ~~2~~ 5

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER ______

Site Location STATE: IA

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N): N N NS NS NS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	6010 Total Metals: B-Ca-Li	6020 Total Metals *	7470 Total Mercury	~~9056 Chloride-Fluoride-Sulfate~~	~~9040 pH~~	~~2540C TDS~~	Field Data (Client Provided)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-301	WT	G	xxx	xxx	1-8-19	0947		1	X		1							X	X	X	X	X	X	X		60291383
2	MW-302	WT	G	xxx	xxx	1-8-19	1030		1	X		1							X	X	X	X	X	X	X		
3	MW-303	WT	G	xxx	xxx	1-8-19	1051		1	X		1							X	X	X	X	X	X	X		
4	MW-304	WT	G	xxx	xxx	1-8-19	1128		1	X		1							X	X	X	X	X	X	X		
5	MW-305	WT	G	xxx	xxx	1-8-19	1155		1	X		1							X	X	X	X	X	X	X		
6	MW-306	WT	G	xxx	xxx	1-8-19	1224		1	X		1							X	X	X	X	X	X	X		
7	~~FIELD BLANK~~	~~WT~~	~~G~~	~~xxx~~	~~xxx~~				~~3~~	~~1~~		~~1~~							~~X~~	~~X~~	~~X~~	~~X~~	~~X~~	~~X~~			
8																											
9																											
10																											
11																											
12																											

BP3N (items 1–6); NS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Ship To: 9608 Loiret Boulevard, Lenexa, KS 66219	[signature] / SCS	1/8/19	1440	[signature] / Pace	1/9/19	0900	0.5	Y	Y	Y
* As-Ba-Be-Cd-Cr-Co-Pb-Mo-Sb-Se-Tl										
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY):

F-ALL-Q-020rev.07, 15-Feb-2007