2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

FLY ASH IMPOUNDMENT
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

Presented To:
Evergy Missouri West, Inc. (f/k/a KCP&L Greater Missouri Operations Co.)

SCS ENGINEERS

27213169.19 | January 2020

8575 W 110th Street, Suite 100
Overland Park, Kansas 66210
913-681-0030

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).

John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).

Douglas L. Doerr

Digitally signed by Douglas L. Doerr
Date: 2020.01.30 13:40:29 -06'00'

Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions

Table of Contents

Section **Page**

Appendices

1 INTRODUCTION

This 2019 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015). Specifically, this report was prepared for Evergy Missouri West, Inc. (f/k/a KCP&L Greater Missouri Operations Company, Inc.) to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2019 Annual Groundwater Monitoring and Corrective Action Report for the Fly Ash Impoundment at the Sibley Generating Station.

2 § 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 site map with an aerial image showing the Fly Ash Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Fly Ash Impoundment groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

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 CCR groundwater monitoring program for the Fly Ash Impoundment 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;

Only detection monitoring was conducted during the reporting period (2019). Samples collected in 2019 were collected and analyzed for Appendix III detection monitoring constituents as indicated in **Appendix B**, **Table 1** (Appendix III Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection, the monitoring program requiring the sample, and the results of the analyses are also provided in these tables. These tables include Fall 2018 semiannual detection monitoring event verification data taken in 2019; Spring 2019 semiannual detection monitoring data; and the initial Fall 2019 semiannual detection monitoring data.

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); and

There was no transition between monitoring programs in 2019. Only detection monitoring was conducted in 2019.

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.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information, if applicable, is provided.

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

a. completion of the Fall 2018 verification sampling and analyses per the certified statistical method,

b. completion of the statistical evaluation of the Fall 2018 semiannual detection monitoring sampling and analysis event per the certified statistical method,

c. completion of the 2018 Annual Groundwater Monitoring and Corrective Action Report,

d. completion of a successful alternative source demonstration for the Fall 2018 semiannual detection monitoring sampling and analysis event,

e. completion of the Spring 2019 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,

f. completion of the statistical evaluation of the Spring 2019 semiannual detection monitoring sampling and analysis event per the certified statistical method,

g. completion of a successful alternative source demonstration for the Spring 2019 semiannual detection monitoring sampling and analysis event, and

h. initiation of the Fall 2019 semiannual detection monitoring sampling and analysis event.

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

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

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2019 detection monitoring sampling and analysis event. Semiannual Spring and Fall 2020 groundwater sampling and analysis. Completion of the statistical evaluation of the Spring 2020 detection monitoring sampling and analysis event, and, if required, alternative source demonstration(s).

2.5.2 § 257.94(d)(3) Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2) Detection Monitoring Alternate Source Demonstration

Demonstration that a source other than the CCR unit caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

The following demonstration reports are included as **Appendix C:**

C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019).

C.2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019).

2.5.4 § 257.95(c)(3) Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because there was no assessment monitoring conducted.

2.5.5 § 257.95(d)(3) Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

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

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. 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 or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

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

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. 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 measures 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 no 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 or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

3 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the conditions encountered at the Sibley Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Missouri West, Inc. for specific application to the Sibley Generating Station Fly Ash Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND:

506 CCR GROUNDWATER MONITORING SYSTEM WELLS

CCR UNIT BOUNDARY

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE, MARCH 2015. MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITORING WELL LOCATIONS ARE APPROXIMATE.

200 0 200 400

SCALE FEET

REV.	DATE
-	-

SHEET TITLE
SITE MAP
FLY ASH IMPOUNDMENT
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2019 GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT

CLIENT
EVERGY MISSOURI WEST, INC
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX (913) 681-0012

PROJ. NO.	DWN. BY:	CHK. BY:	QA/QC BY:	PROJ. MGR.
27213169.19	TGW	JRF	JRF	JRF

DSGN. BY: TGW

CADD FILE:
FIG 1 – SIBLEY FLY ASH IMP.DWG

DATE:
1/07/20

FIGURE NO.
1

N:\KCPL\PROJECTS\GROUNDWATER\DWG\SIBLEY\ANNUAL CCR REPORTING\2019\FIG 1 - SIBLEY FLY ASH IMP.DWG

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Fly Ash Impoundment
Appendix III Detection Monitoring Results
Evergy Sibley Generating Station

Well Number	Sample Date	Appendix III Constituents						
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Dissolved Solids (mg/L)
MW-801	1/11/2019	---	---	*124	---	**6.58	---	---
MW-801	3/12/2019	---	---	*144	---	**6.84	---	---
MW-801	5/22/2019	0.549	178	154	0.151	6.87	88.3	817
MW-801	7/16/2019	*0.326	*152	*127	---	**6.71	*56.6	*613
MW-801	8/21/2019	---	---	*124	---	**6.65	---	---
MW-801	11/6/2019	0.278	144	109	0.172	6.69	59.0	567
MW-802	1/11/2019	---	*111	---	---	**6.66	---	---
MW-802	3/12/2019	---	*107	---	---	**6.91	---	---
MW-802	5/22/2019	<0.200	85.5	62.0	0.227	6.77	35.4	383
MW-802	11/6/2019	<0.200	52.2	32.0	0.157	6.46	49.9	285
MW-803	1/11/2019	---	---	*16.0	---	**7.14	---	---
MW-803	5/22/2019	2.77	119	15.9	0.272	7.01	120	535
MW-803	11/6/2019	2.74	112	17.7	0.300	7.11	107	495
MW-804	1/11/2019	*8.71	---	---	*0.234	**6.97	*31.8	---
MW-804	3/12/2019	*5.71	---	---	---	**7.11	*<5.00	---
MW-804	5/22/2019	7.64	169	17.7	0.233	6.93	<5.00	719
MW-804	7/16/2019	*7.59	---	---	---	**7.48	---	*585
MW-804	8/21/2019	*8.14	---	---	---	**6.95	---	---
MW-804	11/6/2019	8.31	151	19.2	0.269	7.32	<5.00	615
MW-805	5/22/2019	<0.200	98.7	8.65	0.201	7.03	51.1	357
MW-805	11/6/2019	<0.200	94.0	8.65	0.197	7.05	50.5	302
MW-806R	1/11/2019	*5.76	*175	---	---	**7.05	*237	*739
MW-806R	3/12/2019	*5.75	*173	---	---	**7.27	*256	*681
MW-806R	5/22/2019	5.58	171	28.7	0.215	6.99	238	731
MW-806R	7/16/2019	*5.64	*172	---	---	**7.37	*244	*671
MW-806R	8/21/2019	*5.66	*170	---	---	**7.08	*241	---
MW-806R	11/6/2019	5.62	164	28.2	0.213	7.17	249	691

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.
**Extra Sample for Quality Control Validation or per Standard Sampling Procedure
mg/L - miligrams per liter
pCi/L - picocuries per liter
S.U. - Standard Units
--- Not Sampled

Table 2
Fly Ash Impoundment
Detection Monitoring Field Measurements
Evergy Sibley Generating Station

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (µS)	Temperature (°C)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-801	1/11/2019	**6.58	1080	10.98	2.1	160	0.97	20.72	709.64
MW-801	3/12/2019	**6.84	1120	11.92	0.0	164	1.52	21.05	709.31
MW-801	5/22/2019	6.87	1120	16.19	0.0	160	1.39	15.39	714.97
MW-801	7/16/2019	**6.71	1010	14.80	0.0	57	2.21	15.60	714.76
MW-801	8/21/2019	**6.65	995	15.47	0.0	254	1.83	16.78	713.58
MW-801	11/6/2019	6.69	1070	13.03	0.0	51	2.68	17.13	713.23
MW-802	1/11/2019	**6.66	817	11.11	4.6	100	0.00	14.06	717.11
MW-802	3/12/2019	**6.91	814	11.19	0.0	78	0.53	13.83	717.34
MW-802	5/22/2019	6.77	663	12.41	0.0	45	1.17	10.90	720.27
MW-802	11/6/2019	6.46	615	12.70	0.0	71	6.21	11.07	720.10
MW-803	1/11/2019	**7.14	825	11.69	1.4	-298	0.00	22.31	704.58
MW-803	5/22/2019	7.01	820	16.69	0.0	-127	1.98	14.14	712.75
MW-803	11/6/2019	7.11	750	14.81	0.0	-136	0.79	20.25	706.64
MW-804	1/11/2019	**6.97	1050	11.78	20.5	-312	0.00	29.10	699.36
MW-804	3/12/2019	**7.11	1010	13.65	23.1	-129	0.46	27.90	700.56
MW-804	5/22/2019	6.93	1110	17.20	12.2	-135	0.89	15.09	713.37
MW-804	7/16/2019	**7.48	1090	19.50	28.0	-148	5.17	21.05	707.41
MW-804	8/21/2019	**6.95	1020	20.19	25.5	-60	0.00	22.19	706.27
MW-804	11/6/2019	7.32	1120	15.09	10.4	-123	0.55	23.74	704.72
MW-805	5/22/2019	7.03	604	15.29	8.6	-65	6.93	14.08	714.71
MW-805	11/6/2019	7.05	540	14.79	0.0	-67	0.37	27.34	701.45
MW-806R	1/11/2019	**7.05	1070	11.70	5.1	-219	0.00	22.31	706.85
MW-806R	3/12/2019	**7.27	1110	12.93	0.0	-103	0.43	22.34	706.82
MW-806R	5/22/2019	6.99	1010	14.61	19.3	-99	7.65	14.25	714.91
MW-806R	7/16/2019	**7.37	1020	22.19	18.4	-99	5.84	18.17	710.99
MW-806R	8/21/2019	**7.08	987	20.33	0.0	-20	0.00	18.70	710.46
MW-806R	11/6/2019	7.17	1050	14.68	16.4	-78	0.66	19.53	709.63

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

APPENDIX C

ALTERNATIVE SOURCE DEMONSTRATIONS

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019)

C.2 Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019)

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (June 2019)

CCR GROUNDWATER MONITORING

ALTERNATIVE SOURCE DEMONSTRATION REPORT

NOVEMBER 2018 GROUNDWATER MONITORING EVENT

FLY ASH IMPOUNDMENT

SIBLEY GENERATING STATION

SIBLEY, MISSOURI

Presented To:

KCP&L Greater Missouri Operations Company

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

June 2019

File No. 27213169.19

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, R.G.
SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.

Douglas L. Doerr, P.E.
SCS Engineers

Table of Contents

Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. 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.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on November 15, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 2, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a SSI over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on January 11, 2019 and March 12, 2019.

The completed statistical evaluation identified seven Appendix III constituents above their respective prediction limit in monitoring wells MW-801, MW-802, MW-804, and MW-806R.

The prediction limit for boron in monitoring well MW-804 is 5.133 mg/L. The detection monitoring sample was reported at 8.07 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 8.71 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.71 mg/L.

The prediction limit for boron in monitoring well MW-806R is 5.323 mg/L. The detection monitoring sample was reported at 5.56 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 5.76 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 5.75 mg/L.

The prediction limit for calcium in upgradient monitoring well MW-802 is 100.7 mg/L. The detection monitoring sample was reported at 101 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 111 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 107 mg/L.

The prediction limit for calcium in monitoring well MW-806R is 151.8 mg/L. The detection monitoring sample was reported at 168 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 175 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 173 mg/L.

The prediction limit for chloride in upgradient monitoring well MW-801 is 104.1 mg/L. The detection monitoring sample was reported at 115 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 124 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 144 mg/L.

The prediction limit for sulfate in monitoring well MW-806R is 191.9 mg/L. The detection monitoring sample was reported at 236 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 237 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 256 mg/L.

The prediction limit for total dissolved solids (TDS) in monitoring well MW-806R is 679.2 mg/L. The detection monitoring sample was reported at 699 mg/L. The first verification re-sample was collected on January 11, 2019 with a result of 739 mg/L. The second verification re-sample was collected on March 12, 2019 with a result of 681 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring samples for boron from monitoring wells MW-804 and MW-806R, for calcium in monitoring wells MW-802 and MW-806R, for chloride in monitoring well MW-801, and for sulfate and TDS in monitoring well MW-806R exceeds their respective prediction limits and are confirmed statistically significant increases (SSI) over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified SSIs above the background prediction limits for chloride in upgradient monitoring well MW-801, for calcium in upgradient monitoring well MW-802, for boron in monitoring wells MW-804, and for boron, calcium, sulfate, and TDS in monitoring well MW-806R.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above-identified SSIs for the Fly Ash Impoundment at the Sibley Generating Station, there are multiple lines of supporting evidence to indicate the above SSIs were not caused by a release from the Fly Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Fly Ash Impoundment at the time of sampling. As seen on the map, monitoring wells MW-801 and MW-802 are located upgradient from the Fly Ash Impoundment indicating the SSI for chloride in MW-801 and the SSI for calcium in MW-802 are not caused by a release from the Fly Ash Impoundment. This demonstrates that a source other than the Fly Ash Impoundment caused the SSIs over background levels for chloride and calcium in these wells or that

the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

The box and whiskers plot for boron in monitoring well MW-806R was compared to the concentration of boron in ash impoundment pore water (sample ASD-1). The concentration of boron in sample ASD-1 plotted alongside the box and whiskers plot for boron in monitoring well MW-806R, shows the boron concentration in the ash impoundment pore water directly upgradient from MW-806R is less than the boron concentration in MW-806R. This demonstrates that a source other than the Fly Ash Impoundment (specifically ash impoundment pore water directly upgradient of MW-806R) caused the SSI over background levels for boron, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for boron are provided in Appendix B.

The box and whiskers plot for sulfate in monitoring well MW-806R was compared to the box and whiskers plot for sulfate from the river. The box and whiskers plots for sulfate from each location overlap significantly. This occurs even with a limited data set for sulfate from the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for sulfate are provided in Appendix B.

The box and whiskers plot for calcium in monitoring well MW-806R was compared to the box and whiskers plots for calcium from upgradient well MW-801, and from the river, and the calcium concentration from ash impoundment pore water (sample ASD-1). The box and whiskers plots for calcium from MW-806R significantly overlap the plots for upgradient well MW-801 and the river. Additionally, the calcium concentration of the ash impoundment pore water directly upgradient of MW-806R is less than the calcium concentrations of both monitoring wells and the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for calcium are provided in Appendix B.

The box and whiskers plot for TDS in monitoring well MW-806R was compared to the box and whiskers plots for TDS from upgradient well MW-801, and from water from the ash impoundment (sample FLYASHPOND). The box and whiskers plot for TDS from MW-806R overlaps the plot for upgradient well MW-801 and the water from the ash impoundment has TDS levels typically below that of water from MW-806R. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for TDS, or that the SSI resulted from error in

sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for TDS are provided in **Appendix B**.

3.3 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram with plots for MW-801, MW-802, MW-804, and MW-806R was compared to piper diagram plots for three ash pore water samples (ASD-1, ASD-2, and ASD-3) collected in the Fly Ash Impoundment with a Geoprobe® screen-point 15 groundwater sampler. Sample locations are shown on **Figure 1** in **Appendix A**. Samples were collected on the same day for the ash pore water and wells MW-804 and MW-806R. The analytical reports are provided in **Appendix C** along with the piper diagram. The piper diagram plots indicate the groundwater from wells does not exhibit the same geochemical characteristics as the ash pore water. The groundwater and the ash pore water plot in different hydrochemical facies indicating there are two types of water (groundwater and ash pore water). This helps demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels for boron, calcium, TDS, and sulfate or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.5 BORON STABLE ISOTOPE RATIO EVALUATION

The boron stable isotope ratio in coal and coal ash generally vary significantly from the boron stable isotope ratio found in naturally occurring groundwater. The National Bureau of Standards standard reference material 951 (NBS SRM-951), which is a boric acid, is used as the isotopic standard for boron. Boron has two stable isotopes, ^{10}B and ^{11}B. Isotopic ratios of samples are reported as per mil (‰) differences from NBS SRM-951. The delta value for $^{11}B/^{10}B$ is expressed as $\delta^{11}B$, ‰. Previous studies have found $\delta^{11}B$ values for coal ash and coal ash leachate samples between -40 ‰ and +6.6 ‰ and most natural groundwaters have $\delta^{11}B$ values between +10 ‰ and +30 ‰ (Refs. 1, 2, and 3).

A groundwater sample was collected from MW-804 for boron and for $\delta^{11}B$ analysis on November 8, 2018. Additionally, ash pore water samples (ASD-1, ASD-2, and ASD-3) were collected with a Geoprobe® screen-point 15 groundwater sampler on the same day and for the same analysis. Sample locations are shown on **Figure 1** in **Appendix A**. The laboratory reports for the analysis are provided in **Appendix D**.

Boron concentration plotted against $\delta^{11}B$, ‰ for each of the samples are provided in **Appendix D.** The boron concentrations in ASD-1 (3.3 mg/L) and ASD-2 (3.56 mg/L) were less than the boron concentration in MW-804 (8.37 mg/L). The ash pore water from ASD-3 had the highest boron

concentration at 18.8 mg/L. Although groundwater from MW-804 had a boron concentration less than one of the ash pore water samples, the $\delta^{11}B$ for the boron from MW-804 was +12.9 ‰ and significantly greater than the $\delta^{11}B$ for the ash pore water which ranged from -6.18 ‰ to -10.11 ‰. The significantly higher and positive $\delta^{11}B$ for groundwater from MW-804 demonstrates an alternative source of boron at the site other than the Fly Ash Impoundment.

Below the boron vs $\delta^{11}B$ plot in **Appendix D**, is a figure (Ref. 4) showing $\delta^{11}B$ ranges for natural waters from various natural materials and waters impacted by anthropogenic sources. The figure further demonstrates based on $\delta^{11}B$ values for MW-804 that there is an alternative source of boron other than the Fly Ash Impoundment.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASDs, the owner or operator of the Fly Ash Impoundment may continue with the detection monitoring program under § 257.94.

5 REFERENCES

1. **Buska, Paul M., Fitzpatrick, John and Watson, Lee R. and Kay, Robert T.** *Evaluation of Ground-Water and Boron Sources by Use of Boron Stable-Isotope Ratios,Tritium, and Selected Water Chemistry Constituents near Beverly Shores, Northwestern Indiana*, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5166. 2007).

2. *A Twenty-Month Geochemical and Isotopic Investigation into Environmental Impacts of the 2008 TVA Coal Ash Spill, - May*. **Ruhl, Laura S. and Vengosh, Avner and Dwyer, Gary S. and Hsu-Kim, Heileen and Deonarine, Amrika**. Denver, CO, USA : s.n., 2011. 2011 World of Coal Ash (WOCA) Conference - May 9-12, 2011.

3. *Boron and Strontium Isotopic Characterization of Coal Combustion Residuals: Validation of Novel Environmental Tracers,* Paper No. 30616-208920. **Ruhl, Laura.** Charlotte, NC : s.n., 2012. 2012 Geological Society of America Annual Meeting and Exposition, 4-7 November.

4. **Ruhl, Laura.** *Geochemical and Isotopic Characterization of Coal Combustion Residuals: Implications for Potential Environmental Impacts.* Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Earth and Ocean Sciences in the Graduate School of Duke University, 2012.

6 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive

use of KCP&L Greater Missouri Operations Company for specific application to the Sibley Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1

LEGEND:

- 760 — GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 801 — GROUNDWATER MONITORING SYSTEM WELL (GROUNDWATER ELEVATION)
- CCR SURFACE IMPOUNDEMENT UNIT BOUNDARY
- GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 165305111.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. MARCH 2015.
3. BOUNDARY AND MONITORING WELL WELL LOCATIONS SHOWN ARE APPROXIMATE.

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (NOV. 2018)
CCR FLY ASH IMPOUNDMENT

PROJECT TITLE
CCR ALTERNATIVE SOURCE DEMONSTRATION

CLIENT
KCP&L GREATER MISSOURI OPERATIONS CO.
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St. Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO. 27213169.19
DSN. BY: TGW
DWN. BY: TGW
CHK. BY: JRF
Q/A RVW BY: JRR
PROJ. MGR. JRF

CADD FILE:
18-NOV_ALTERNATIVE SOURCE DEMONSTRATION.DWG

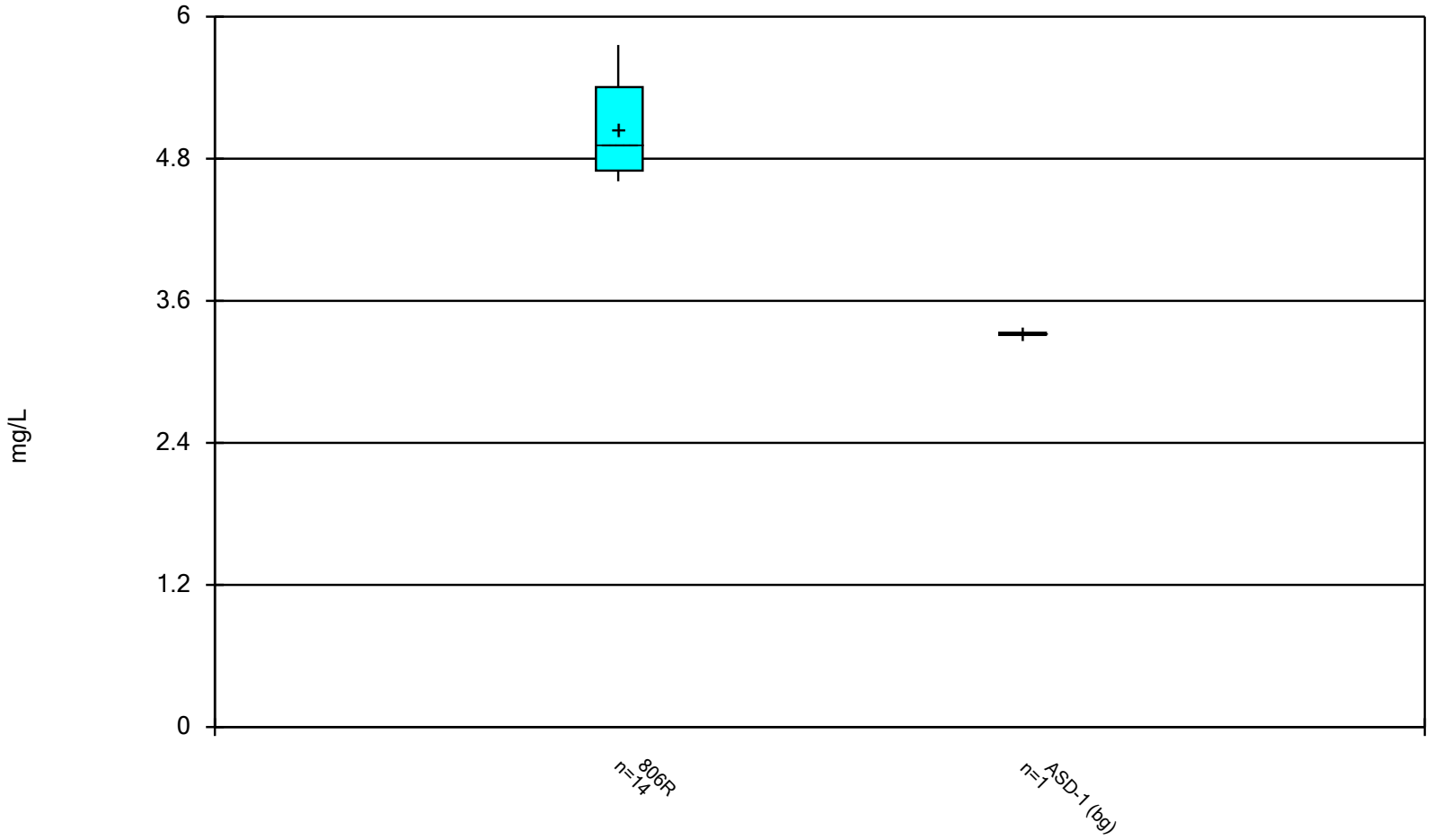
DATE: 06/07/19

FIGURE NO. 1

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Boron Analysis Run 5/23/2019 1:15 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Boron (mg/L) Analysis Run 5/23/2019 1:17 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

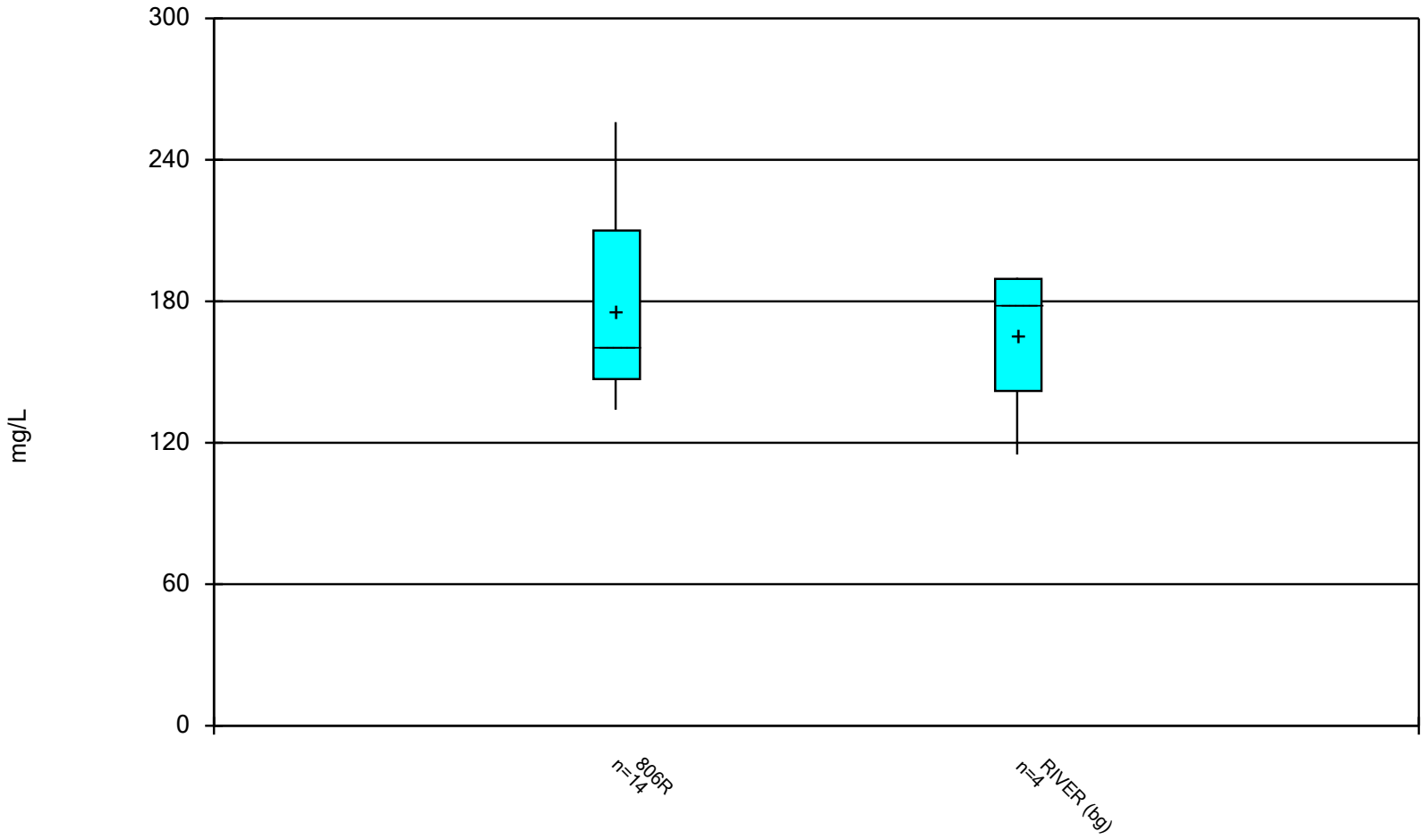
	806R	ASD-1 (bg)
6/2/2016	5.1	
7/19/2016	4.81	
8/23/2016	5.25	
11/11/2016	4.77	
2/9/2017	4.64	
3/22/2017	5.02	
5/3/2017	4.76	
8/1/2017	4.61	
10/4/2017	4.77	
5/16/2018	4.64	
11/8/2018	5.19	3.33
11/15/2018	5.56	
1/11/2019	5.76	
3/12/2019	5.75	
Median	4.915	3.33
LowerQ.	4.7	3.33
UpperQ.	5.405	3.33
Min	4.61	3.33
Max	5.76	3.33
Mean	5.045	3.33

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:17 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Boron (mg/L)	806R	14	5.045	0.4062	0.1086	4.915	4.61	5.76	0
Boron (mg/L)	ASD-1 (bg)	1	3.33	0	0	3.33	3.33	3.33	0

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 5/23/2019 1:04 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L) Analysis Run 5/23/2019 1:05 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

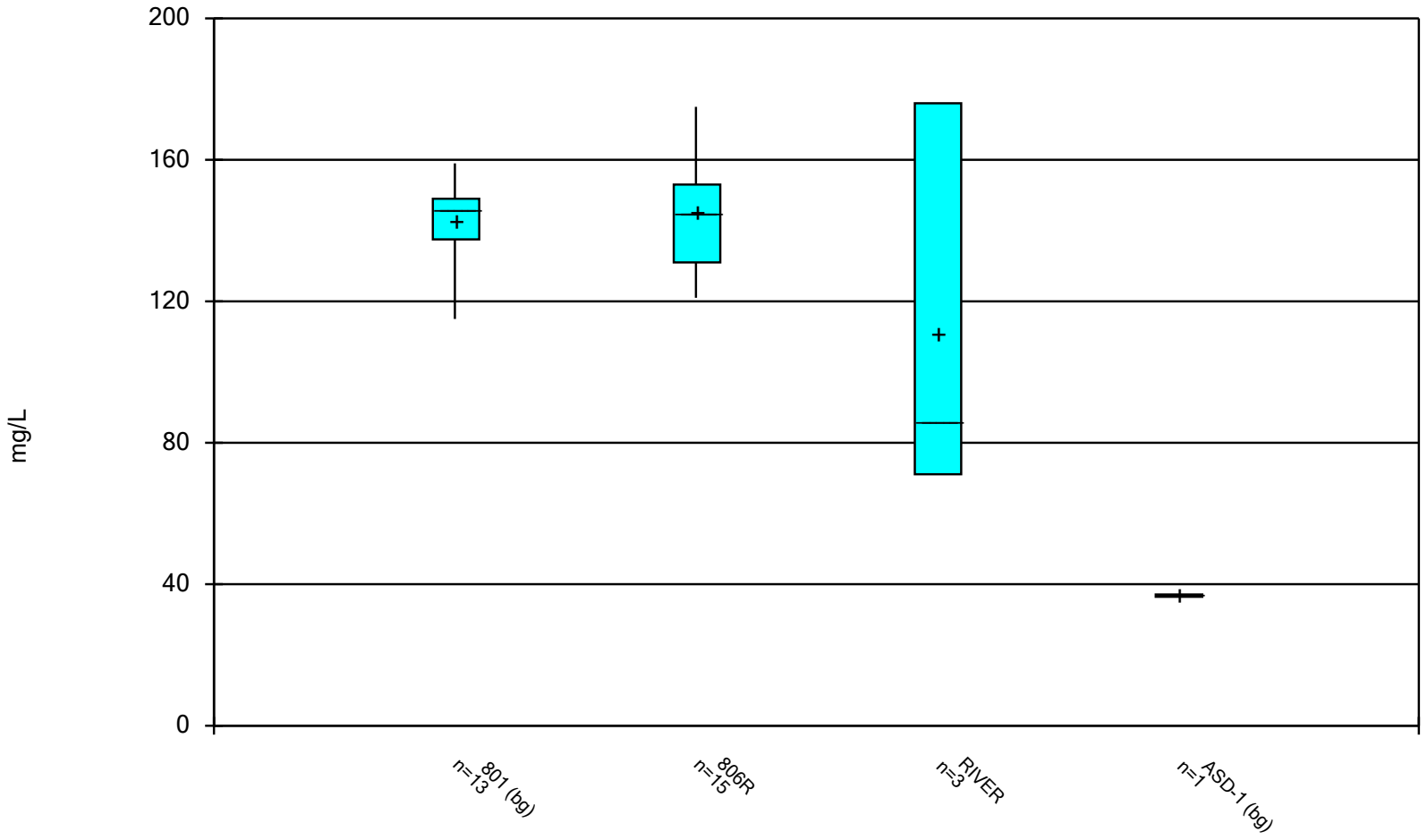
	806R	RIVER (bg)
5/26/2016		115
6/2/2016	182	
7/19/2016	139	169
8/23/2016	146	
11/10/2016		190
11/11/2016	134	
2/9/2017	165	189
3/22/2017	150	
5/3/2017	149	
8/1/2017	181	
10/4/2017	148	
5/16/2018	157	
11/8/2018	184	
11/15/2018	236	
1/11/2019	237	
3/12/2019	256	
Median	161	179
LowerQ.	147	142
UpperQ.	210	189.5
Min	134	115
Max	256	190
Mean	176	165.8

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:05 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Sulfate (mg/L)	806R	14	176	39.76	10.63	161	134	256	0
Sulfate (mg/L)	RIVER (bg)	4	165.8	35.19	17.59	179	115	190	0

Box & Whiskers Plot



Constituent: Calcium Analysis Run 5/23/2019 12:44 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Calcium (mg/L) Analysis Run 5/23/2019 12:46 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

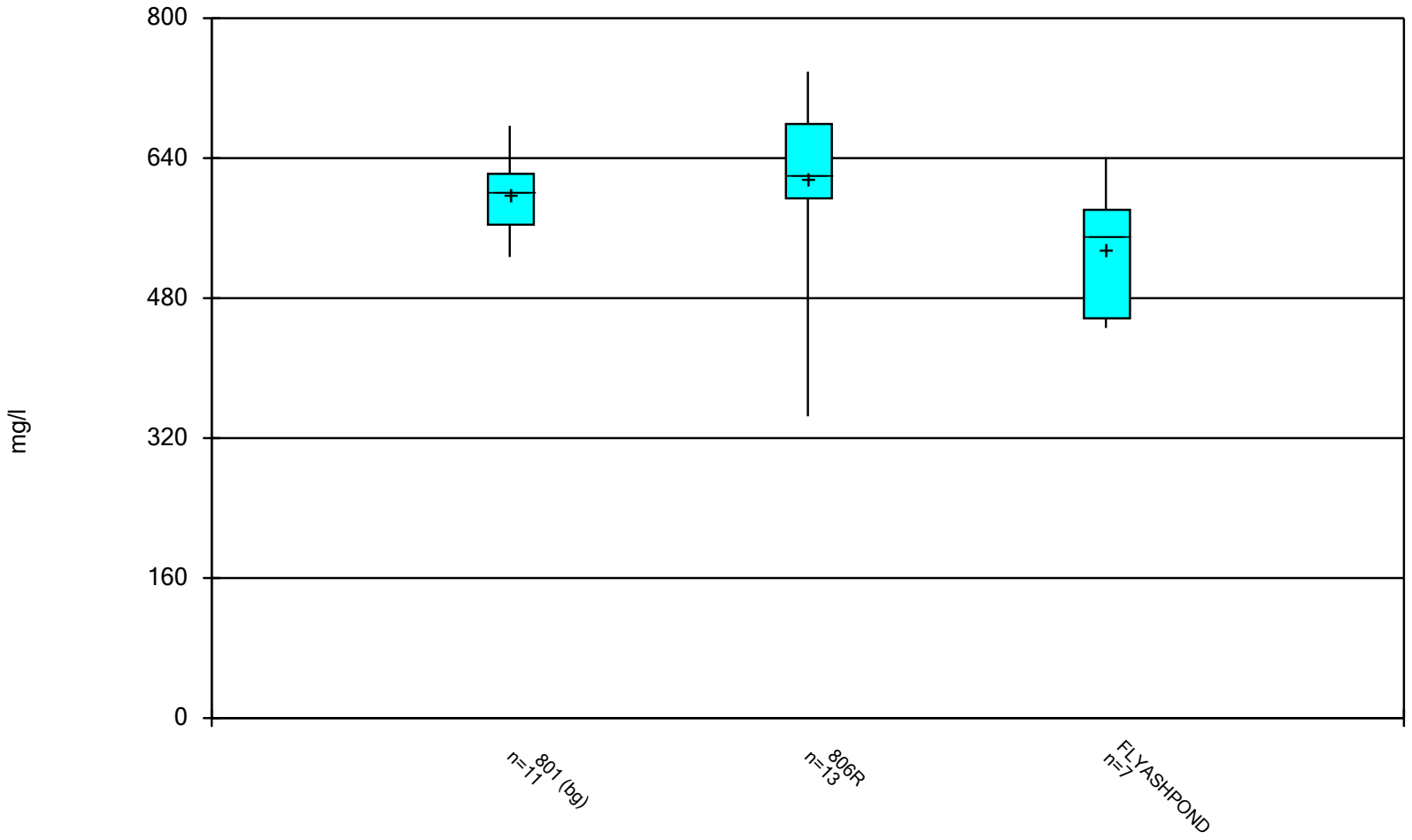
	801 (bg)	806R	RIVER	ASD-1 (bg)
12/16/2015	159			
2/17/2016	150			
5/26/2016	147		85.7	
6/2/2016		135		
7/19/2016		131		
8/23/2016	137	141		
11/10/2016	143		176	
11/11/2016		137		
2/9/2017	115	123	71.1	
3/22/2017		126		
5/3/2017	127	121		
8/1/2017	138	149		
10/4/2017	148	148		
11/16/2017	156			
11/17/2017		151		
5/16/2018	146	145		
11/8/2018		153		37.1
11/15/2018	143	168		
1/11/2019	146	175		
3/12/2019		173		
Median	146	145	85.7	37.1
LowerQ.	137.5	131	71.1	37.1
UpperQ.	149	153	176	37.1
Min	115	121	71.1	37.1
Max	159	175	176	37.1
Mean	142.7	145.1	110.9	37.1

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 12:46 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Calcium (mg/L)	801 (bg)	13	142.7	11.66	3.235	146	115	159	0
Calcium (mg/L)	806R	15	145.1	17.19	4.437	145	121	175	0
Calcium (mg/L)	RIVER	3	110.9	56.82	32.81	85.7	71.1	176	0
Calcium (mg/L)	ASD-1 (bg)	1	37.1	0	0	37.1	37.1	37.1	0

Box & Whiskers Plot



Constituent: Dissolved Solids Analysis Run 5/23/2019 12:59 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Dissolved Solids (mg/l) Analysis Run 5/23/2019 1:00 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801 (bg)	806R	FLYASHPOND
12/16/2015	601		
2/17/2016	589		
5/26/2016	669		457
6/2/2016		677	
7/19/2016		624	
8/23/2016	544	605	641
11/10/2016	602		552
11/11/2016		589	
2/9/2017	564	633	581
3/22/2017		568	
5/3/2017	622	620	
5/4/2017			446
8/1/2017	527	599	559
10/4/2017	677	621	521
5/16/2018	609	345	
11/15/2018	586	699	
1/11/2019		739	
3/12/2019		681	
Median	601	621	552
LowerQ.	564	594	457
UpperQ.	622	679	581
Min	527	345	446
Max	677	739	641
Mean	599.1	615.4	536.7

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 5/23/2019, 1:00 PM

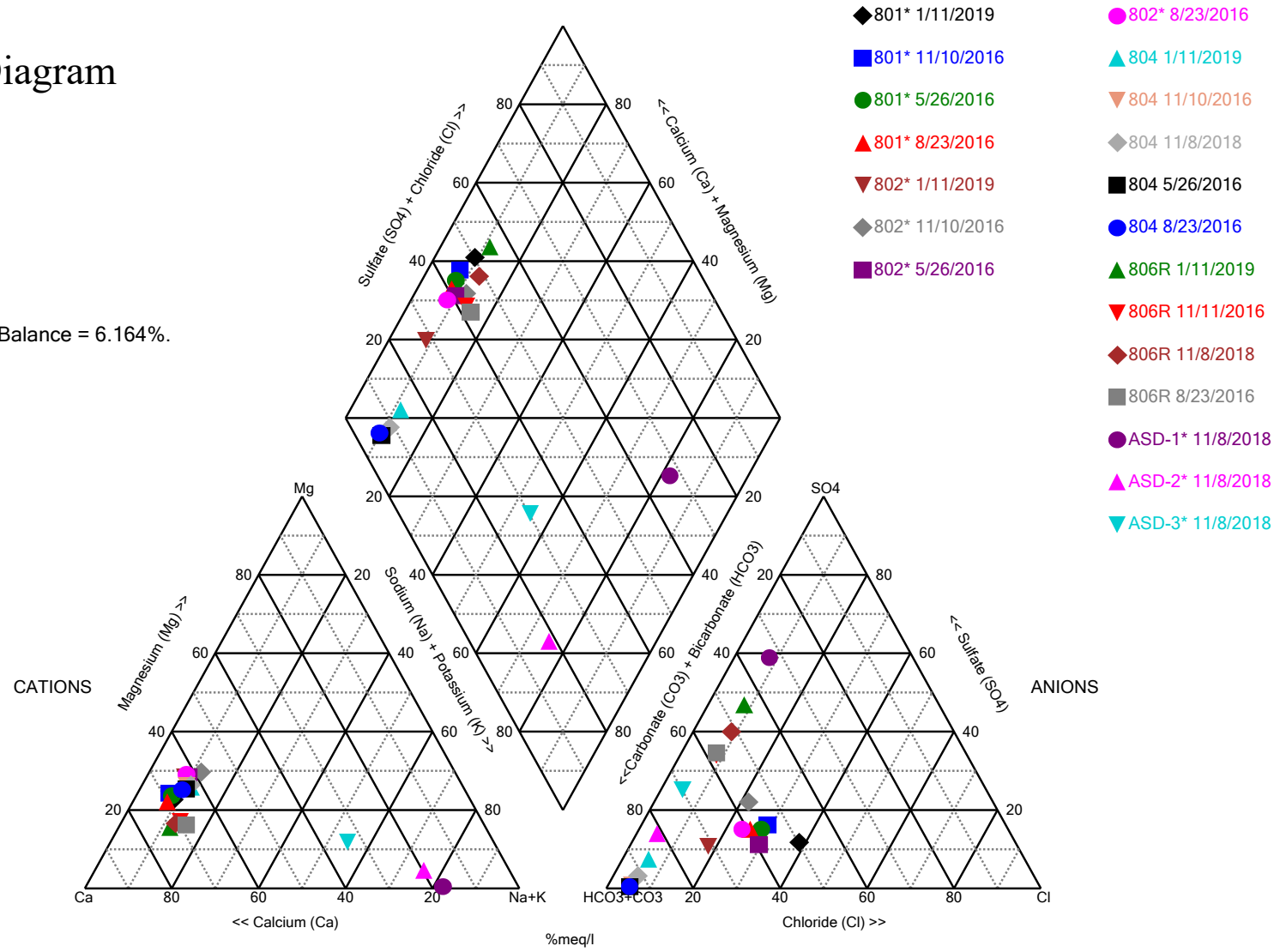
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Dissolved Solids (mg/l)	801 (bg)	11	599.1	46.18	13.92	601	527	677	0
Dissolved Solids (mg/l)	806R	13	615.4	94.53	26.22	621	345	739	0
Dissolved Solids (mg/l)	FLYASHPOND	7	536.7	68.8	26	552	446	641	0

Appendix C

Piper Diagram and Laboratory Results

Piper Diagram

Cation-Anion Balance = 6.164%.



Analysis Run 4/2/2019 3:54 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Piper Diagram

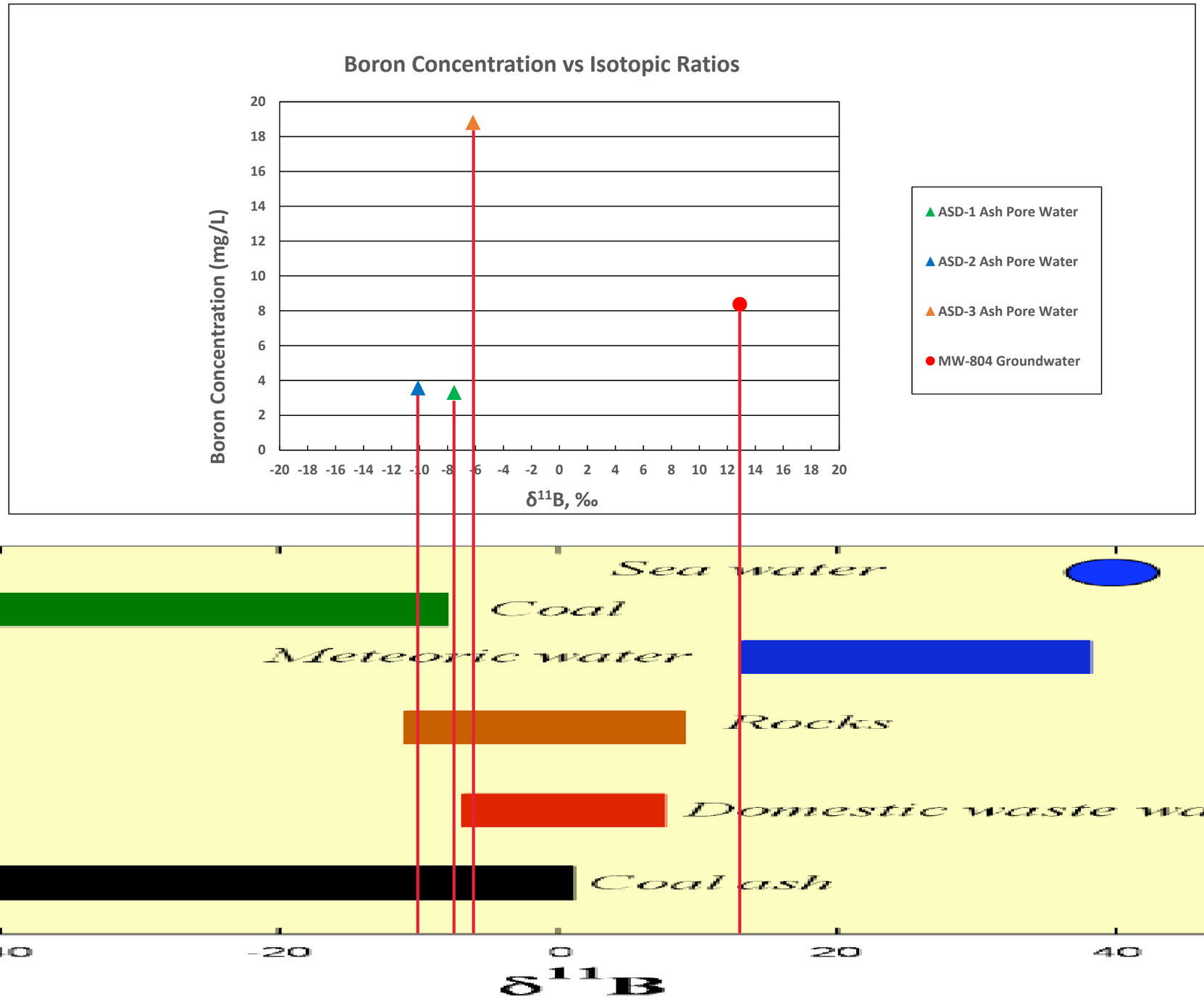
Analysis Run 4/2/2019 3:55 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
801* 5/26/2016	19.1	1.43	147	31	88.2	65.2	304	10
801* 8/23/2016	16.9	1.15	137	25.8	73.8	58.6	288	10
801* 11/10/2016	17	1.21	143	30	88.2	66.5	282	10
801* 1/11/2019	21.9	1.28	146	29	124	52.3	271	10
802* 5/26/2016	10.6	2.43	68.9	19.3	50.5	26.1	161	10
802* 8/23/2016	11.5	2.67	82.2	23.2	46.3	41.2	199	10
802* 11/10/2016	9.98	2.56	49.6	15.1	26.6	38	106	10
802* 1/11/2019	15.3	3.3	111	30.1	44.2	37.1	304	10
804 5/26/2016	27.8	5.99	167	39.8	15.5	2.5	596	10
804 8/23/2016	24.9	4.62	157	37	14.4	2.5	551	10
804 11/10/2016	26.2	4.71	155	39	14.2	2.5	525	10
804 11/8/2018	30.1	5.76	158	39.8	18.3	14.1	561	10
804 1/11/2019	26.8	5.58	145	35.7	17.6	31.8	479	10
806R 8/23/2016	34.5	3.75	141	19.7	22.9	146	298	10
806R 11/11/2016	29.1	3.49	137	20.2	22.9	134	277	10
806R 11/8/2018	29	3.46	153	21.4	27.2	184	287	10
806R 1/11/2019	30.1	3.69	175	22.8	28.4	237	274	10
ASD-1* 11/8/2018	178	38.6	37.1	0.5	29.3	303	10	104
ASD-2* 11/8/2018	497	82.4	124	17	43.8	211	10	795
ASD-3* 11/8/2018	365	42.2	208	43.8	41.5	336	10	592

Appendix D

Boron and Stable Isotope Plots and Laboratory Results


Boron Concentration vs Isotopic Ratios
Boron Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20
δ11B, ‰
ASD-1 Ash Pore Water
ASD-2 Ash Pore Water
ASD-3 Ash Pore Water
MW-804 Groundwater
Sea water
Coal
Meteoric water
Rocks
Domestic waste water
Coal ash
-40
-20
0
20
40
δ11B

Report

L1836000

17HVXQ17MHY

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-804**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535495

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1836000
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-804	**U11535495**	**12.89**	*0.74*
MW-804, r.2	**U11535495**	**13.26**	*0.82*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1833729

17HW78DG7V0

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

This report replaces any previous report with the same number.

Analysis: IR

Your ID	**ASD-1**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535491

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-2**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535492

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-3**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535493

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1833729
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
ASD-1	U11535491	-7.53	*0.89*
ASD-1, r.2	U11535491	-7.08	*0.77*
ASD-2	U11535492	-10.11	*0.90*
ASD-3	U11535493	-6.18	*0.81*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042982
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-804 L1042982-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 15:35	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:32	ST

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8370		200	1	11/14/2018 13:32	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

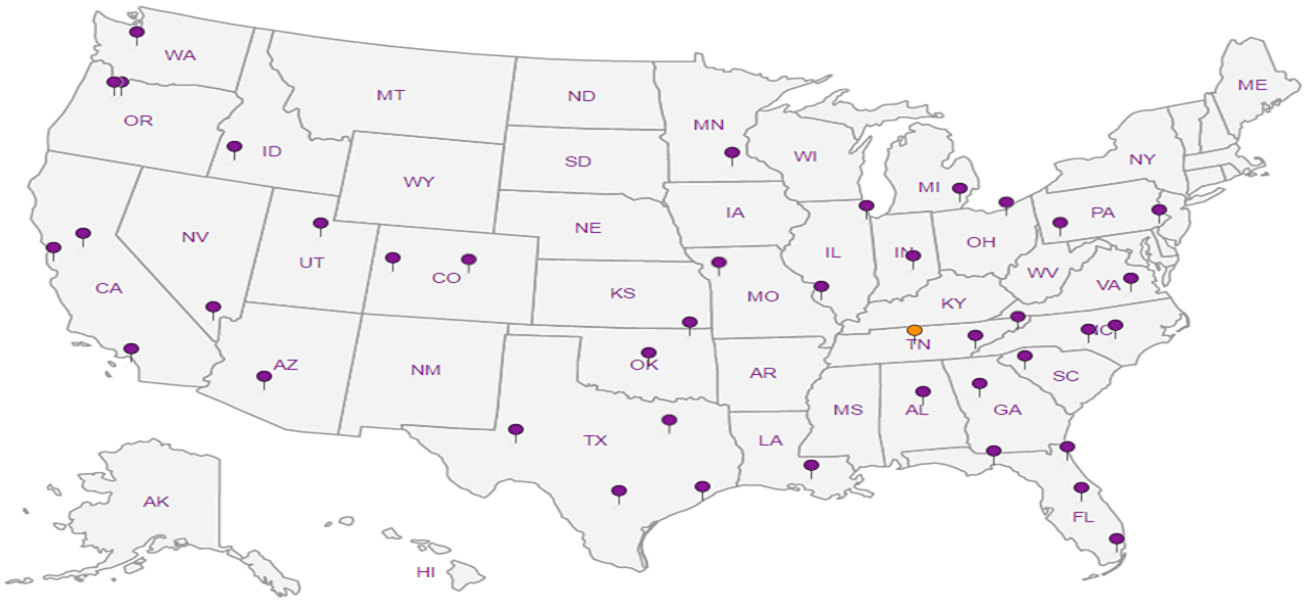
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ✓ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Boron 250ml HDPE - HNO3

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
MW-804	GRAB	GW	-	11/8/18	1535	1	X		-01

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042982

C184

Acctnum: **AQUAOPKS**

Template:

Prelogin:

TSR:

PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ___ Temp ___

Flow ___ Other ___

Samples returned via:
__ UPS ✓ FedEx __ Courier ___

Tracking # 4510 1661 7507

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 1 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		✓Y N
Bottles arrive intact:		✓Y N
Correct bottles used:		✓Y N
Sufficient volume sent:		✓Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		✓Y N

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042995
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

ASD-1 L1042995-01 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 11:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:53	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:56	WBD

ASD-2 L1042995-02 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 12:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:00	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:59	WBD

ASD-3 L1042995-03 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 13:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:03	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 16:02	WBD

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3330		200	1	11/14/2018 13:53	WG1194483
Boron,Dissolved	3160		200	1	11/10/2018 15:56	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3560		200	1	11/14/2018 14:00	WG1194483
Boron,Dissolved	2750		200	1	11/10/2018 15:59	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	18800		200	1	11/14/2018 14:03	WG1194483
Boron,Dissolved	17600		200	1	11/10/2018 16:02	WG1194495

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Method Blank (MB)

(MB) R3358770-1 11/10/18 14:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron,Dissolved	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3358770-2 11/10/18 14:53 • (LCSD) R3358770-3 11/10/18 14:55

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron,Dissolved	1000	1000	989	100	98.9	80.0-120			1.14	20

L1042719-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042719-01 11/10/18 14:58 • (MS) R3358770-5 11/10/18 15:03 • (MSD) R3358770-6 11/10/18 15:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron,Dissolved	1000	ND	1130	1180	95.7	101	1	75.0-125			4.35	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

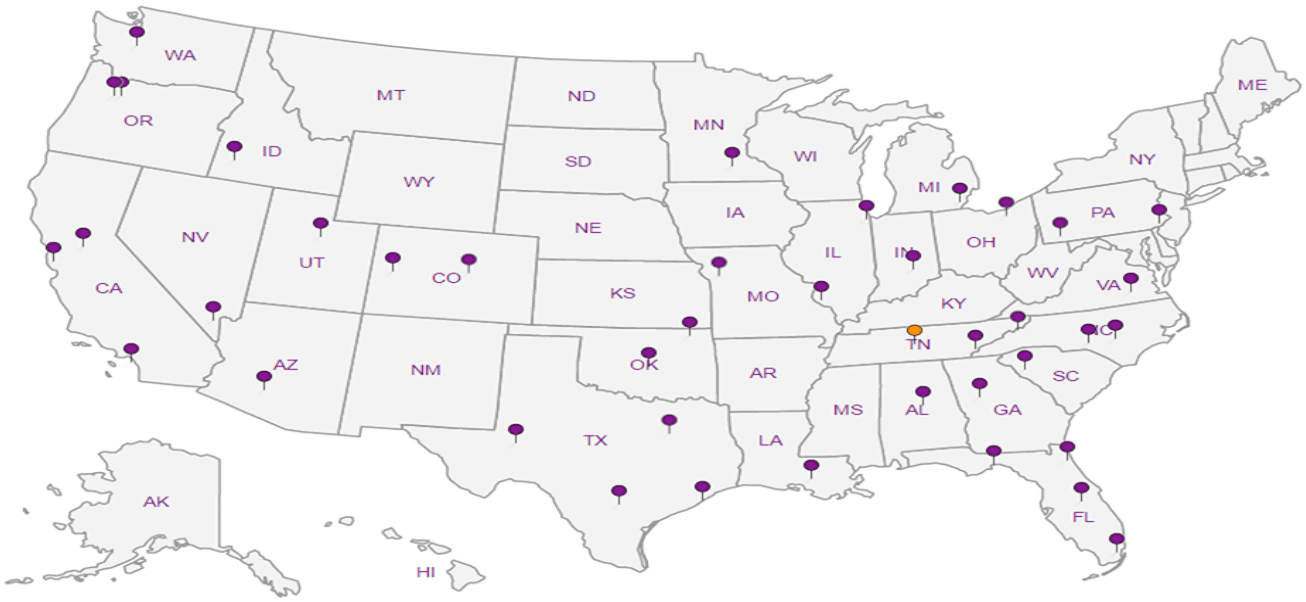
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
8575W. 110th Street
Overland Park, KS 66210

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042995

C188

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project #

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ✓ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Acctnum: **AQUAOPKS**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Diss Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
ASD-1	Grab	GW	-	11/8/18	1120	2	X	X		-01
ASD-2	↓	GW	-		1220	2	X	X		02
ASD-3	↓	GW	-	↓	1320	2	X	X		03

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking # 4510 1661 7507

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 2.1/1.2.0 °C Bottles Received: 6 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

C.2 Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, Fly Ash Impoundment, Sibley Generating Station (December 2019)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
MAY 2019 GROUNDWATER MONITORING EVENT

FLY ASH IMPOUNDMENT
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

Presented To:

Evergy Missouri West, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

December 2019

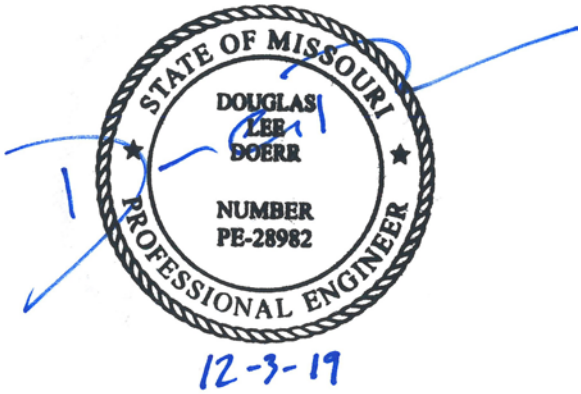
File No. 27213169.19

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, R.G.
SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Fly Ash Impoundment at the Sibley Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.



Douglas L. Doerr, P.E.
SCS Engineers

Table of Contents

Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. 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.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Fly Ash Impoundment at the Sibley Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on May 22, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 3, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on July 16, 2019 and August 21, 2019.

The completed statistical evaluation identified four Appendix III constituents above their respective prediction limit (background value) in monitoring wells MW-801, MW-804, and MW-806R.

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
Boron				
804	5.133	7.64	7.59	8.14
806R	5.323	5.58	5.64	5.66
Calcium				
806R	151.8	171	172	170
Chloride				

Constituent/Monitoring Well	*UPL	Observation May 22, 2019	1st Verification July 16, 2019	2nd Verification August 21, 2019
801	104.1	154	127	124
Sulfate				
806R	191.9	238	244	241

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation confirmed five SSIs above the background prediction limits. These include boron in downgradient monitoring wells MW-804 and MW-806R; calcium in monitoring well MW-806R; chloride in upgradient monitoring well MW-801; and, sulfate in monitoring well MW-806R.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above-identified SSIs for the Fly Ash Impoundment at the Sibley Generating Station, there are multiple lines of supporting evidence to indicate the above SSIs were not caused by a release from the Fly Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Fly Ash Impoundment at the time of sampling. As seen on the map, monitoring well MW-801 is located upgradient from the Fly Ash Impoundment indicating the SSI for chloride in MW-801 was not caused by a release from the Fly Ash Impoundment. This demonstrates that a source other than the Fly Ash Impoundment caused the SSI over background levels for chloride in this well or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

The box and whiskers plot for boron in monitoring well MW-806R was compared to the concentration of boron in Ash Impoundment pore water (sample ASD-1). The concentration of boron in sample ASD-1 plotted alongside the box and whiskers plot for boron in monitoring well MW-806R, shows the boron

concentration in the ash impoundment pore water directly upgradient from MW-806R is less than the boron concentration in MW-806R. This demonstrates that a source other than the Fly Ash Impoundment (specifically Ash Impoundment pore water directly upgradient of MW-806R) caused the SSI over background levels for boron, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for boron are provided in **Appendix B**.

The box and whiskers plot for sulfate in monitoring well MW-806R was compared to the box and whiskers plot for sulfate from the river. The box and whiskers plots for sulfate from each location overlap significantly. This occurs even with a limited data set for sulfate from the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for sulfate are provided in **Appendix B**.

The box and whiskers plot for calcium in monitoring well MW-806R was compared to the box and whiskers plots for calcium from upgradient well MW-801, and from the river, and the calcium concentration from ash impoundment pore water (sample ASD-1). The box and whiskers plots for calcium from MW-806R significantly overlap the plots for upgradient well MW-801 and the river. Additionally, the calcium concentration of the ash impoundment pore water directly upgradient of MW-806R is less than the calcium concentrations of both monitoring wells and the river. Such an overlap demonstrates that a source other than the Fly Ash Impoundment could easily have caused the SSI over background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots for calcium are provided in **Appendix B**.

3.3 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram with plots for MW-801, MW-802, MW-804, and MW-806R was compared to piper diagram plots for three ash pore water samples (ASD-1, ASD-2, and ASD-3) collected in the Fly Ash Impoundment with a Geoprobe® screen-point 15 groundwater sampler. Sample locations are shown on **Figure 1** in **Appendix A**. Samples were collected on the same day for the ash pore water and wells MW-804 and MW-806R. The analytical reports are provided in **Appendix C** along with the piper diagram.

The piper diagram plots indicate the groundwater from the wells does not exhibit the same geochemical characteristics as the ash pore water. The groundwater and the ash pore water plot in different hydrochemical facies indicating there are two types of water (groundwater and ash pore water) and that the waters are not mixing. This helps demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels for boron, calcium, chloride, and sulfate or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.4 BORON STABLE ISOTOPE RATIO EVALUATION

The boron stable isotope ratio in coal and coal ash generally vary significantly from the boron stable isotope ratio found in naturally occurring groundwater. The National Bureau of Standards standard reference material 951 (NBS SRM-951), which is a boric acid, is used as the isotopic standard for boron. Boron has two stable isotopes, ^{10}B and ^{11}B. Isotopic ratios of samples are reported as per mil (‰) differences from NBS SRM-951. The delta value for $^{11}B/^{10}B$ is expressed as $\delta^{11}B$, ‰. Previous studies have found $\delta^{11}B$ values for coal ash and coal ash leachate samples between -40 ‰ and +6.6 ‰ and most natural groundwaters have $\delta^{11}B$ values between +10 ‰ and +30 ‰ (Refs. 1, 2, and 3).

A groundwater sample was collected from MW-804 and MW-806R for boron and for $\delta^{11}B$ analysis on November 8, 2018. Additionally, ash pore water samples (ASD-1, ASD-2, and ASD-3) were collected with a Geoprobe® Screen-Point 15 groundwater sampler on the same day and for the same analysis. Sample locations are shown on **Figure 1** in **Appendix A**. The laboratory reports for the analysis are provided in **Appendix D**.

Boron concentration plotted against $\delta^{11}B$, ‰ for each of the samples are provided in **Appendix D.** The boron concentrations in ASD-1 (3.3 mg/L) and ASD-2 (3.56 mg/L) were less than the boron concentrations in both MW-804 (8.37 mg/L) and MW-806R (5.19). The ash pore water from ASD-3 had the highest boron concentration at 18.8 mg/L. Although groundwater from MW-804 and MW-806R had boron concentrations less than one of the ash pore water samples, the $\delta^{11}B$ for the boron from MW-804 and MW-806R were +12.9 ‰ and -2.08 ‰, respectively. These values were significantly greater than the $\delta^{11}B$ for the ash pore water which ranged from -6.18 ‰ to -10.11 ‰. The significantly higher $\delta^{11}B$ for groundwater from MW-806R and positive $\delta^{11}B$ for groundwater from MW-804 demonstrates an alternative source of boron at the site other than the Fly Ash Impoundment.

Below the boron vs $\delta^{11}B$ plot in **Appendix D**, is a figure (Ref. 4) showing $\delta^{11}B$ ranges for natural waters from various natural materials and waters impacted by anthropogenic sources. The figure further demonstrates based on $\delta^{11}B$ values for MW-804 and MW-806R that there is an alternative source of boron other than the Fly Ash Impoundment.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Fly Ash Impoundment caused the SSIs over background levels, or that the SSIs resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASDs, the owner or operator of the Fly Ash Impoundment may continue with the detection monitoring program under § 257.94.

5 REFERENCES

1. **Buska, Paul M., Fitzpatrick, John and Watson, Lee R. and Kay, Robert T**. *Evaluation of Ground-Water and Boron Sources by Use of Boron Stable-Isotope Ratios, Tritium, and Selected Water Chemistry Constituents near Beverly Shores, Northwestern Indiana*, 2004. U.S. Geological Survey Scientific Investigations Report 2007-5166. 2007).

2. **Ruhl, Laura S. and Vengosh, Avner and Dwyer, Gary S. and Hsu-Kim, Heileen and Deonarine, Amrika**. *A Twenty-Month Geochemical and Isotopic Investigation into Environmental Impacts of the 2008 TVA Coal Ash Spill, - May*. Denver, CO, USA : s.n., 2011. 2011 World of Coal Ash (WOCA) Conference - May 9-12, 2011.

3. **Ruhl, Laura.** *Boron and Strontium Isotopic Characterization of Coal Combustion Residuals: Validation of Novel Environmental Tracers,* Paper No. 30616-208920. Charlotte, NC : s.n., 2012. 2012 Geological Society of America Annual Meeting and Exposition, 4-7 November.

4. **Ruhl, Laura.** *Geochemical and Isotopic Characterization of Coal Combustion Residuals: Implications for Potential Environmental Impacts.* Dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Earth and Ocean Sciences in the Graduate School of Duke University, 2012.

6 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Missouri West, Inc. for specific application to the Sibley Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represent that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1

LEGEND:

- 760 — GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE OF THIS UNIT)
- 601 (734.55) — GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- ASD–2 — GEOPROBE® PORE WATER SAMPLE LOCATION
- FLY ASH IMPOUNDMENT UNIT BOUNDARY
- GROUNDWATER FLOW DIRECTION

NOTES:

1. HORIZONTAL & VERTICAL DATUM: URS PLANS FOR CONSTRUCTION, KCP&L SIBLEY GENERATING STATION, DESIGN FILE 16530511.00001, DATED JANUARY 2010
2. GOOGLE EARTH AERIAL IMAGE. APRIL 2018.
3. BOUNDARY AND MONITORING WELL WELL LOCATIONS SHOWN ARE APPROXIMATE.

200 0 200 400
SCALE FEET

REV.	DATE
-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (MAY 2019)
CCR FLY ASH IMPOUNDMENT

PROJECT TITLE
CCR ALTERNATIVE SOURCE DEMONSTRATION

CLIENT
Evergy Missouri West, Inc.
(operator Evergy Metro, Inc.)
SIBLEY GENERATING STATION
SIBLEY, MISSOURI

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	Q/A RVW BY:
27213167.18	DAW	DLD
SUBC. BY:	**CHK. BY:**	**PROJ. MGR.**
DAW	JRR	JRF

CADD FILE:
POTENTIOMETRIC SURFACE MAP (MAY 2019).DWG

DATE:
10/22/19

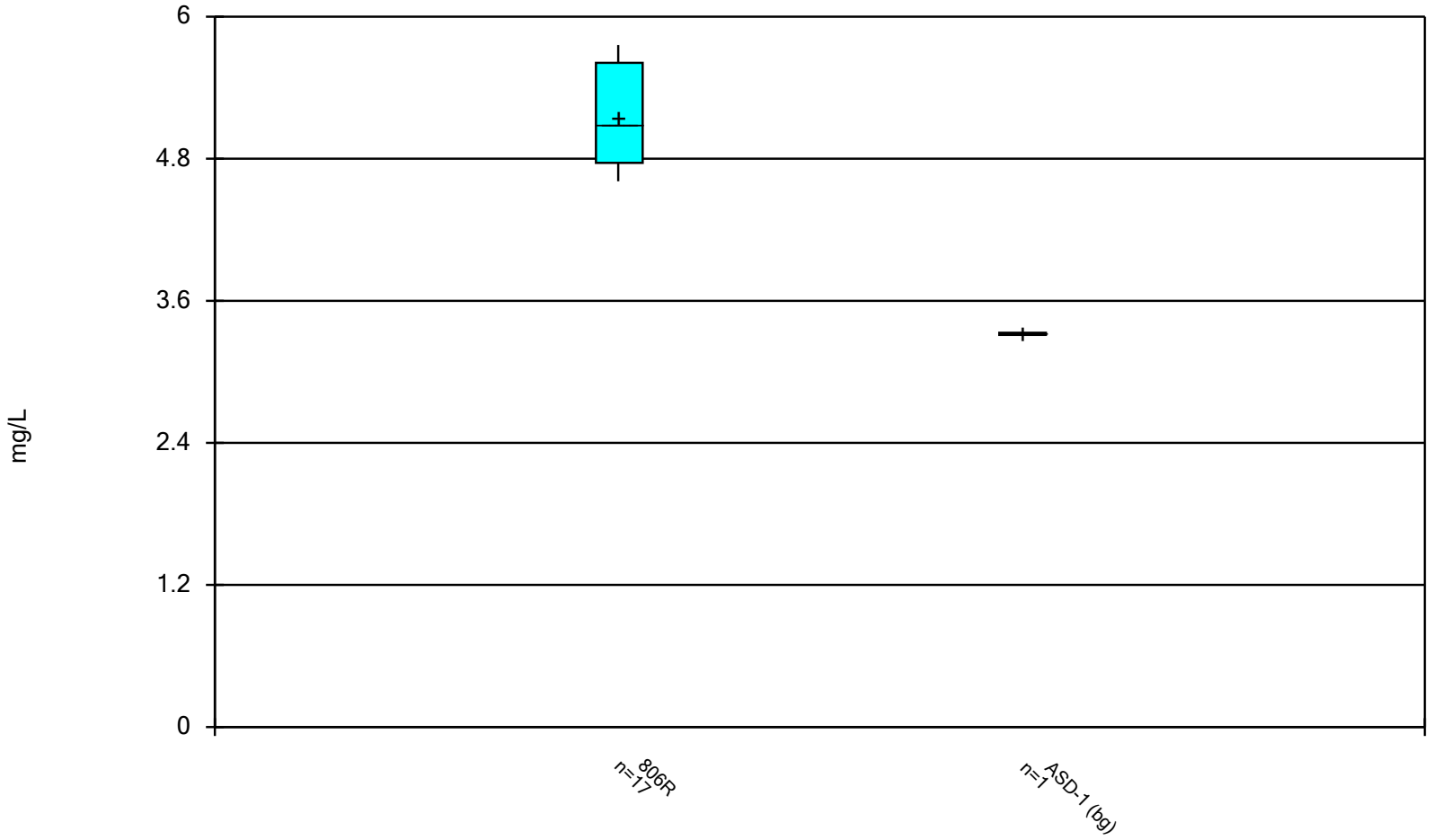
FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\Sibley\2018\GW\Potentiometric Surface Map (May 2019).dwg Oct 22, 2019 - 3:49pm Layout Name: 1 By: 4470daw

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Boron Analysis Run 10/22/2019 2:17 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Boron (mg/L) Analysis Run 10/22/2019 2:18 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

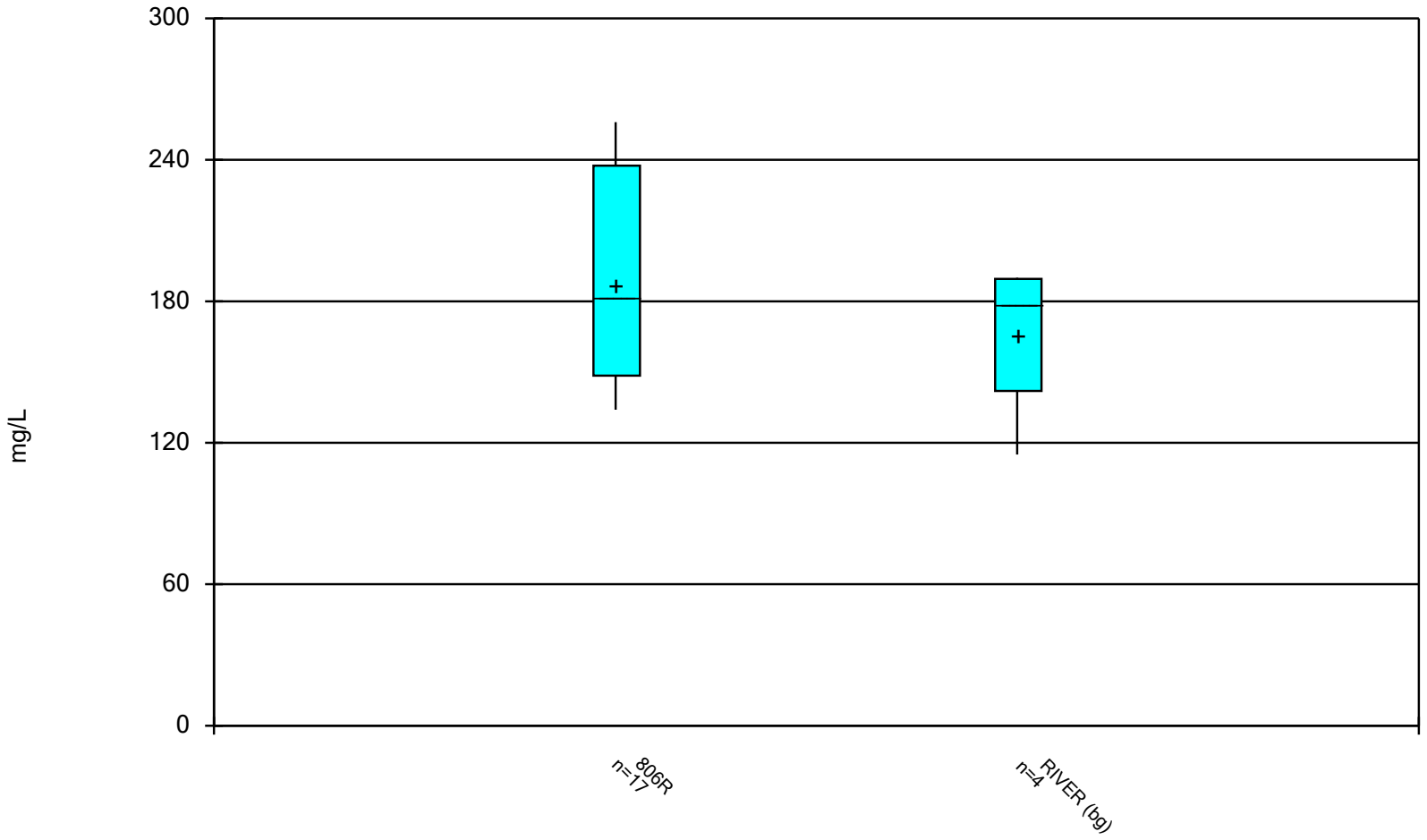
	806R	ASD-1 (bg)
6/2/2016	5.1	
7/19/2016	4.81	
8/23/2016	5.25	
11/11/2016	4.77	
2/9/2017	4.64	
3/22/2017	5.02	
5/3/2017	4.76	
8/1/2017	4.61	
10/4/2017	4.77	
5/16/2018	4.64	
11/8/2018	5.19	3.33
11/15/2018	5.56	
1/11/2019	5.76	
3/12/2019	5.75	
5/22/2019	5.58	
7/16/2019	5.64	
8/21/2019	5.66	
Median	5.1	3.33
LowerQ.	4.765	3.33
UpperQ.	5.61	3.33
Min	4.61	3.33
Max	5.76	3.33
Mean	5.148	3.33

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:18 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Boron (mg/L)	806R	17	5.148	0.4319	0.1047	5.1	4.61	5.76	0
Boron (mg/L)	ASD-1 (bg)	1	3.33	0	0	3.33	3.33	3.33	0

Box & Whiskers Plot



Constituent: Sulfate Analysis Run 10/22/2019 2:23 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Sulfate (mg/L) Analysis Run 10/22/2019 2:23 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

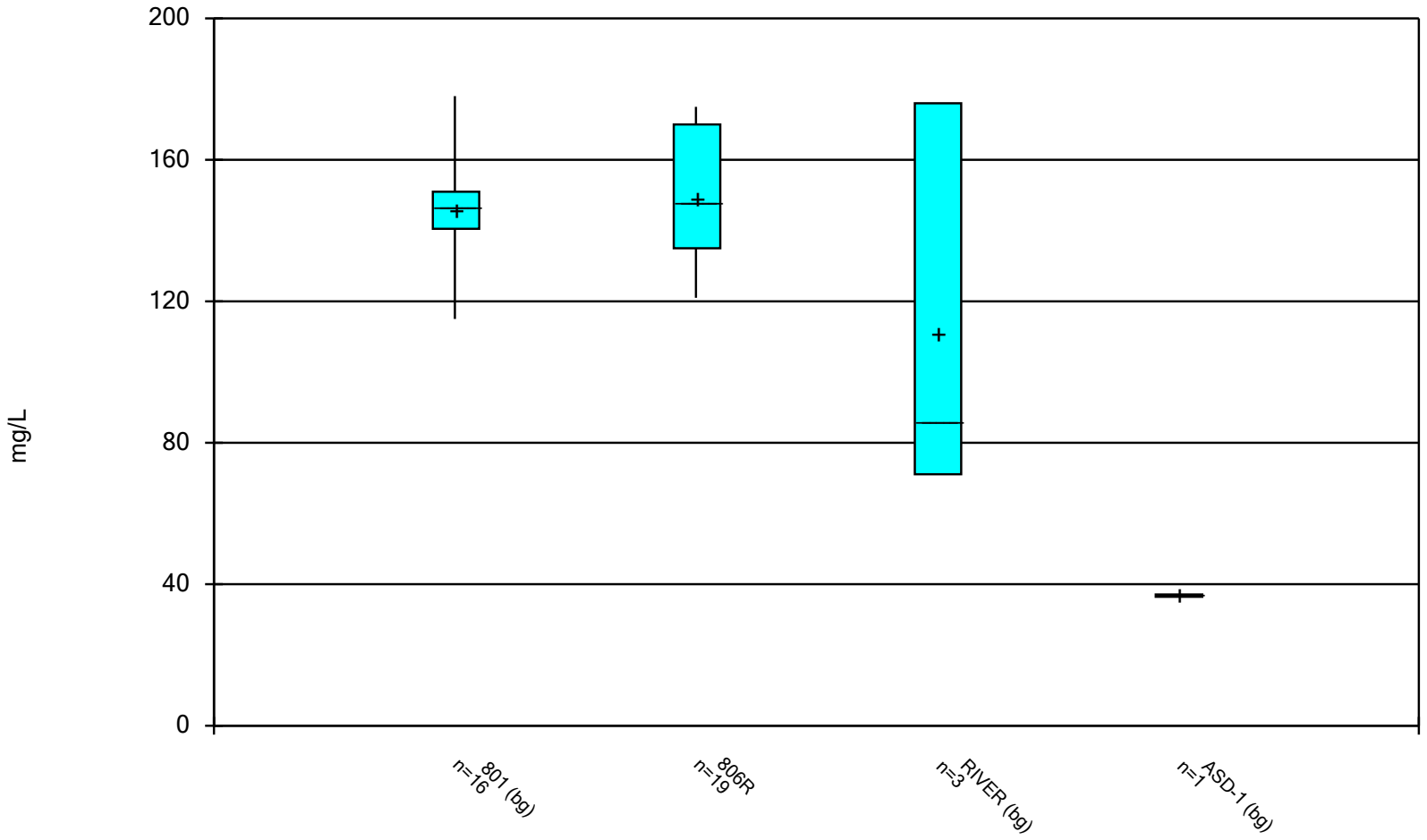
	806R	RIVER (bg)
5/26/2016		115
6/2/2016	182	
7/19/2016	139	169
8/23/2016	146	
11/10/2016		190
11/11/2016	134	
2/9/2017	165	189
3/22/2017	150	
5/3/2017	149	
8/1/2017	181	
10/4/2017	148	
5/16/2018	157	
11/8/2018	184	
11/15/2018	236	
1/11/2019	237	
3/12/2019	256	
5/22/2019	238	
7/16/2019	244	
8/21/2019	241	
Median	181	179
LowerQ.	148.5	142
UpperQ.	237.5	189.5
Min	134	115
Max	256	190
Mean	187.5	165.8

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:23 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Sulfate (mg/L)	806R	17	187.5	44.02	10.68	181	134	256	0
Sulfate (mg/L)	RIVER (bg)	4	165.8	35.19	17.59	179	115	190	0

Box & Whiskers Plot



Constituent: Calcium Analysis Run 10/22/2019 2:27 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Box & Whiskers Plot

Constituent: Calcium (mg/L) Analysis Run 10/22/2019 2:31 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

	801 (bg)	806R	RIVER (bg)	ASD-1 (bg)
12/16/2015	159			
2/17/2016	150			
5/26/2016	147		85.7	
6/2/2016		135		
7/19/2016		131		
8/23/2016	137	141		
11/10/2016	143		176	
11/11/2016		137		
2/9/2017	115	123	71.1	
3/22/2017		126		
5/3/2017	127	121		
8/1/2017	138	149		
10/4/2017	148	148		
10/5/2017	148	142		
11/16/2017	156			
11/17/2017		151		
5/16/2018	146	145		
11/8/2018		153		37.1
11/15/2018	143	168		
1/11/2019	146	175		
3/12/2019		173		
5/22/2019	178	171		
7/16/2019	152	172		
8/21/2019		170		
Median	146.5	148	85.7	37.1
LowerQ.	140.5	135	71.1	37.1
UpperQ.	151	170	176	37.1
Min	115	121	71.1	37.1
Max	178	175	176	37.1
Mean	145.8	149	110.9	37.1

Box & Whiskers Plot

Sibley Client: SCS Engineers Data: Sibley Printed 10/22/2019, 2:31 PM

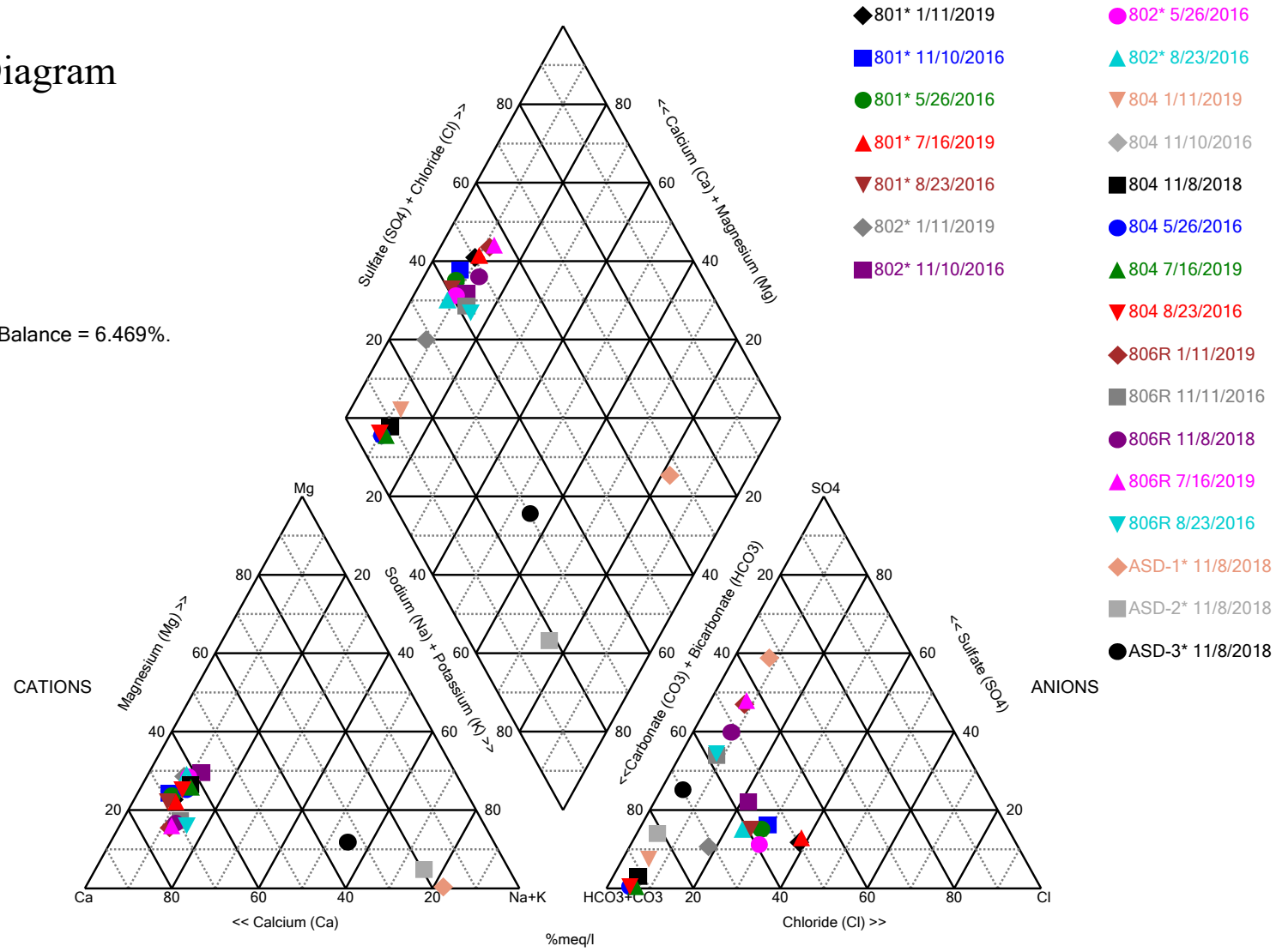
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Calcium (mg/L)	801 (bg)	16	145.8	13.76	3.439	146.5	115	178	0
Calcium (mg/L)	806R	19	149	18.06	4.143	148	121	175	0
Calcium (mg/L)	RIVER (bg)	3	110.9	56.82	32.81	85.7	71.1	176	0
Calcium (mg/L)	ASD-1 (bg)	1	37.1	0	0	37.1	37.1	37.1	0

Appendix C

Piper Diagram and Laboratory Results

Piper Diagram

Cation-Anion Balance = 6.469%.



Analysis Run 10/22/2019 2:39 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Piper Diagram

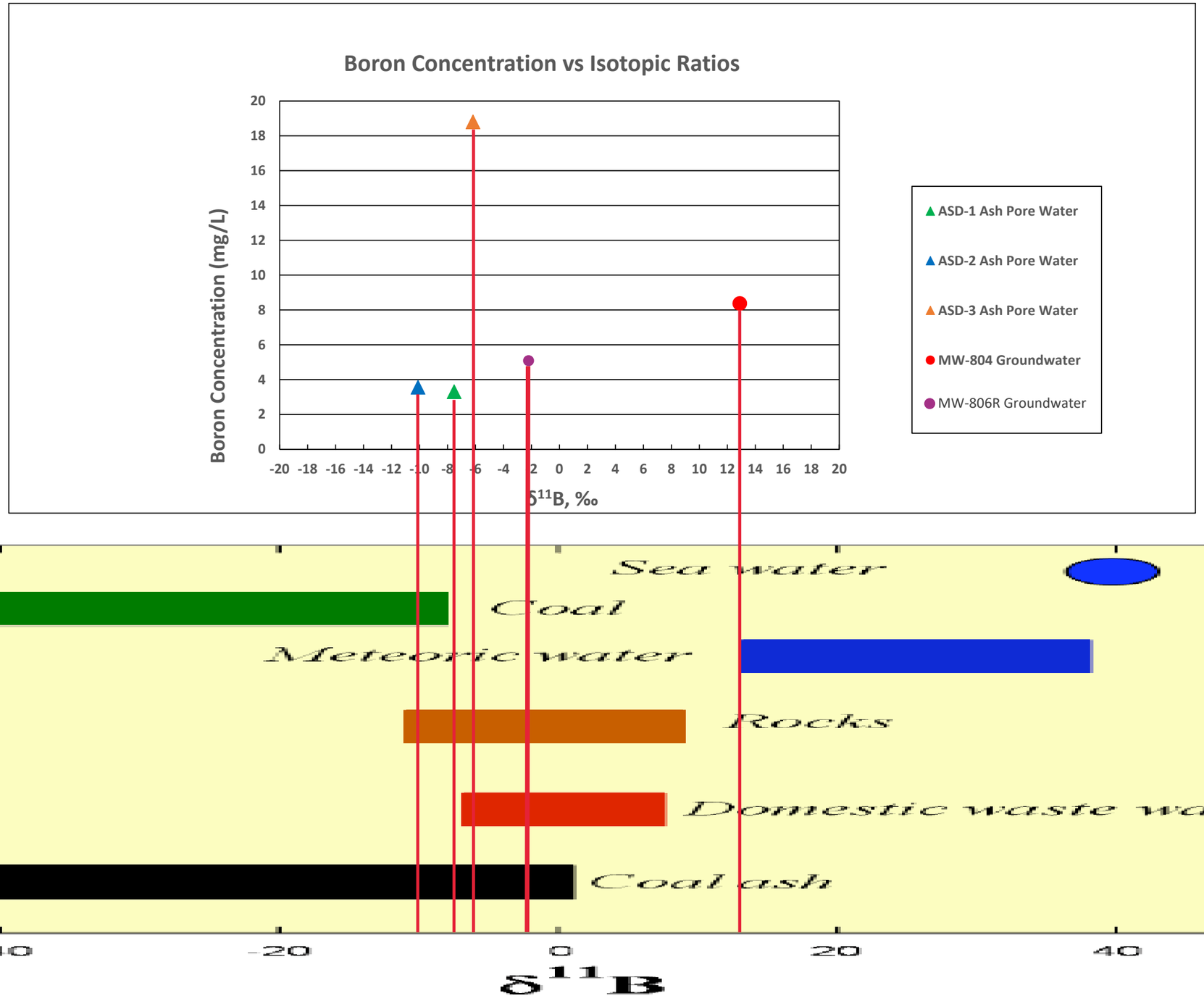
Analysis Run 10/22/2019 2:42 PM View: Ash Pond III

Sibley Client: SCS Engineers Data: Sibley

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
801* 5/26/2016	19.1	1.43	147	31	88.2	65.2	304	10
801* 8/23/2016	16.9	1.15	137	25.8	73.8	58.6	288	10
801* 11/10/2016	17	1.21	143	30	88.2	66.5	282	10
801* 1/11/2019	21.9	1.28	146	29	124	52.3	271	10
801* 7/16/2019	24.4	1.28	152	29.3	127	56.6	266	10
802* 5/26/2016	10.6	2.43	68.9	19.3	50.5	26.1	161	10
802* 8/23/2016	11.5	2.67	82.2	23.2	46.3	41.2	199	10
802* 11/10/2016	9.98	2.56	49.6	15.1	26.6	38	106	10
802* 1/11/2019	15.3	3.3	111	30.1	44.2	37.1	304	10
804 5/26/2016	27.8	5.99	167	39.8	15.5	2.5	596	10
804 8/23/2016	24.9	4.62	157	37	14.4	2.5	551	10
804 11/10/2016	26.2	4.71	155	39	14.2	2.5	525	10
804 11/8/2018	30.1	5.76	158	39.8	18.3	14.1	561	10
804 1/11/2019	26.8	5.58	145	35.7	17.6	31.8	479	10
804 7/16/2019	28.6	6.68	158	39.3	18.6	2.5	545	10
806R 8/23/2016	34.5	3.75	141	19.7	22.9	146	298	10
806R 11/11/2016	29.1	3.49	137	20.2	22.9	134	277	10
806R 11/8/2018	29	3.46	153	21.4	27.2	184	287	10
806R 1/11/2019	30.1	3.69	175	22.8	28.4	237	274	10
806R 7/16/2019	30.9	3.89	172	23.3	29.2	244	268	10
ASD-1* 11/8/2018	178	38.6	37.1	0.5	29.3	303	10	104
ASD-2* 11/8/2018	497	82.4	124	17	43.8	211	10	795
ASD-3* 11/8/2018	365	42.2	208	43.8	41.5	336	10	592

Appendix D

Boron and Stable Isotope Plots and Laboratory Results


Boron Concentration vs Isotopic Ratios
Boron Concentration (mg/L)
20
18
16
14
12
10
8
6
4
2
0
-20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20
δ11B, ‰
ASD-1 Ash Pore Water
ASD-2 Ash Pore Water
ASD-3 Ash Pore Water
MW-804 Groundwater
MW-806R Groundwater
Sea water
Coal
Meteoric water
Rocks
Domestic waste water
Coal ash
-40
-20
0
20
40
δ11B

Report

L1836000

17HVXQ17MHY

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-804**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535495

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1836000
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-804	**U11535495**	**12.89**	*0.74*
MW-804, r.2	**U11535495**	**13.26**	*0.82*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1835999

17HW1HNB94B

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

Analysis: IR

Your ID	**MW-806R**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535494

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

ALS Scandinavia AB
Aurorum 10
977 75 Luleå
Sweden

Web: www.alsglobal.se
Email: info.lu@alsglobal.com
Tel: + 46 920 28 9900
Fax: + 46 920 28 9940

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1835999
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
MW-806R	U11535494	-2.08	*0.79*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature

Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Report

L1833729

17HW78DG7V0

Date received **2018-11-22**
Issued **2018-12-07**

SCS Engineers
Jason R. Franks

8575 West 110 Street Suit 100
Overland Park, Kansas 66210
United States

Project **913-749-0716**

This report replaces any previous report with the same number.

Analysis: IR

Your ID	**ASD-1**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535491

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-2**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535492

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

Your ID	**ASD-3**
Sampler	**Jason R. Franks**
Sampled	**2018-11-08**
LabID	U11535493

Analysis	Results	Unit	Method	Issuer	Sign
Report in Excel *	**yes**		1	I	IR

	Method specification
1	Analysed according to see separate report in excel.

	Approver
IR	Ilia Rodioushkine

	Issuer[1]
I	Man.Inm.

* indicates unaccredited analysis.

[1] The technical unit within ALS Scandinavia where the analysis was carried out, alternatively the subcontractor for the analysis.

REPORT OF ANALYSIS

Issued by:	ALS Scandinavia AB, Aurorum 10, S-977 75 Luleå, Sweden
Client:	SCS Engineers
Date of receipt:	2018-11-22
Date of analysis:	2018-12-03
Order number (our):	L1833729
Your reference:	Jason R. Franks
Our reference:	Ilia Rodushkin

Sample ID	Lab ID	$\delta^{11}B$, ‰	2 SD
ASD-1	U11535491	-7.53	*0.89*
ASD-1, r.2	U11535491	-7.08	*0.77*
ASD-2	U11535492	-10.11	*0.90*
ASD-3	U11535493	-6.18	*0.81*

Comments

The analysis is carried out by MC-ICP-MS (MEPTUNE PLUS, ThermoScientific) and MC-ICP-MS (NEPTUNE PLUS) using internal standartization and external calibration with bracketing isotope SRMs

Analysis is carried out after ion exchange separation

Delta 11B values calculated to NIST SRM 951

SD calculated from two independent consequintive measurements

Signature Ilia Rodushkin

Ilia Rodushkin
Associate Professor
LABORATORY MANAGER
ALS Scandinavia AB

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042982
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-804 L1042982-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 15:35	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:32	ST

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	8370		200	1	11/14/2018 13:32	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

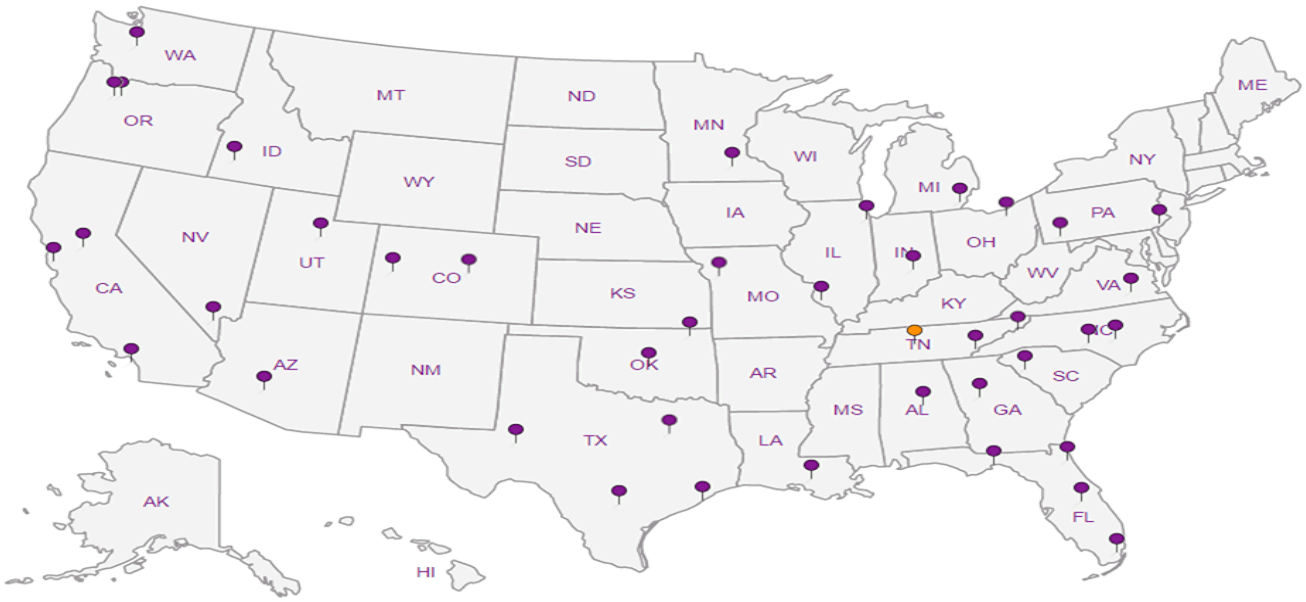
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27213169.18**

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ✓ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Pres Chk

Boron 250ml HDPE - HNO3

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
MW-804	GRAB	GW	-	11/8/18	1535	1	X		-01

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042982

C184

Acctnum: **AQUAOPKS**

Template:

Prelogin:

TSR:

PB:

Shipped Via:

* Matrix:
SS - Soil **AIR** - Air **F** - Filter
GW - Groundwater **B** - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ___ Temp ___

Flow ___ Other ___

Samples returned via:
__ UPS ✓ FedEx __ Courier ___

Tracking # 4510 1661 7507

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 1 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		✓Y N
Bottles arrive intact:		✓Y N
Correct bottles used:		✓Y N
Sufficient volume sent:		✓Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		✓Y N

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042981
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-806R L1042981-01 GW

Collected by	Collected date/time	Received date/time
Jason Franks	11/08/18 14:10	11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:29	ST

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	5190		200	1	11/14/2018 13:29	WG1194483

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

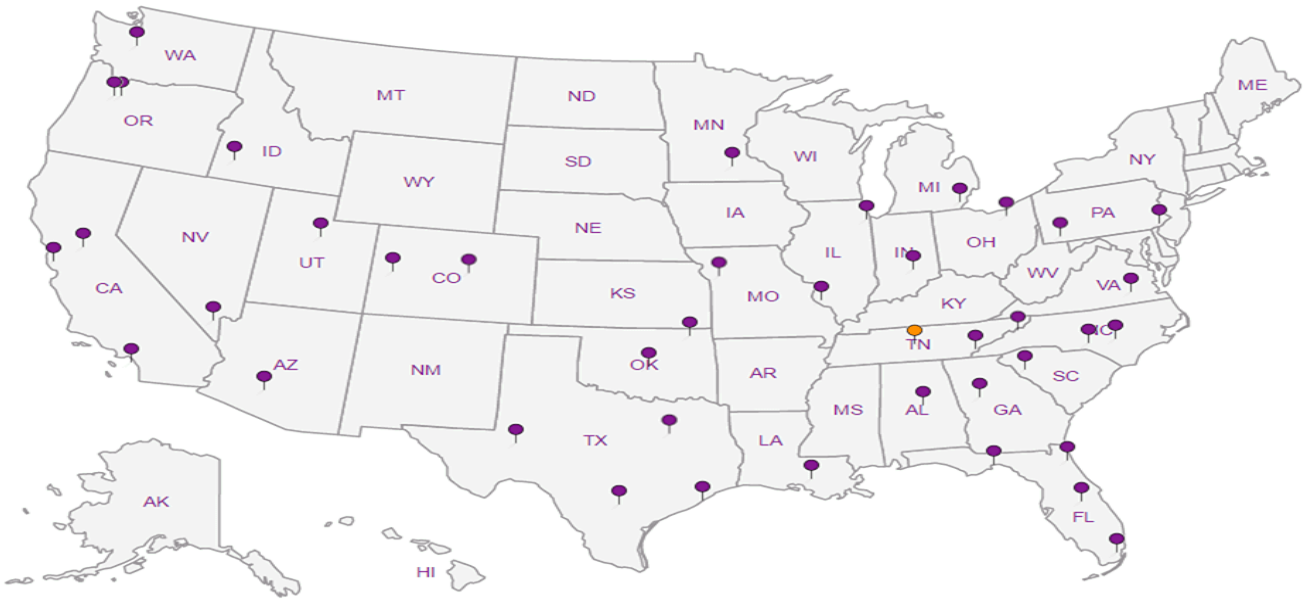
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



Company: SCSE Engineers - KS
8575 W. 110th Street
Overland Park, KS 66210

Billing Information:

Report to: Jason Franks

Email To: Jfranks@scsengineers.com

Project Description: KCP&L Sibley Generating Station

City/State Collected: SIBLEY, MO

Phone: 913-681-0030
Fax: 913-681-0012

Client Project #: 27213169.18

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y ___

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
MW-806R	GRAB	GW	-	11/8/18	1410	1	X		-01

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

RAD SCREEN: <0.5 mR/hr

pH ___ Temp ___

Flow ___ Other ___

Samples returned via: __ UPS ✓ FedEx __ Courier

Tracking # 4510 1661 7507

Trip Blank Received: Yes / (No)
HCL / MeoH
TBR

Temp: 2.1 °C Bottles Received: 1

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Date: 11/9/18 Time: 845

Sample Receipt Checklist

COC Seal Present/Intact:	NP	Y N
COC Signed/Accurate:		Y N
Bottles arrive intact:		Y N
Correct bottles used:		Y N
Sufficient volume sent:		Y N
If Applicable		
VOA Zero Headspace:		Y N
Preservation Correct/Checked:		Y N

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042981

C185

Acctnum: AQUAOPKS

Template:

Prelogin:

TSR:

PB:

Shipped Via:

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

November 15, 2018

SCS Engineers - KS

Sample Delivery Group:	L1042995
Samples Received:	11/09/2018
Project Number:	27213169.18
Description:	KCP&L Sibley Generating Station

Report To: Jason Franks
8575 W. 110th Street
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

ASD-1 L1042995-01 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 11:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 13:53	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:56	WBD

ASD-2 L1042995-02 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 12:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:00	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 15:59	WBD

ASD-3 L1042995-03 GW

Collected by: Jason Franks
Collected date/time: 11/08/18 13:20
Received date/time: 11/09/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1194483	1	11/13/18 13:25	11/14/18 14:03	ST
Metals (ICP) by Method 6010B	WG1194495	1	11/10/18 10:52	11/10/18 16:02	WBD

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3330		200	1	11/14/2018 13:53	WG1194483
Boron,Dissolved	3160		200	1	11/10/2018 15:56	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	3560		200	1	11/14/2018 14:00	WG1194483
Boron,Dissolved	2750		200	1	11/10/2018 15:59	WG1194495

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	18800		200	1	11/14/2018 14:03	WG1194483
Boron,Dissolved	17600		200	1	11/10/2018 16:02	WG1194495

Method Blank (MB)

(MB) R3359958-1 11/14/18 12:59

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3359958-2 11/14/18 13:01 • (LCSD) R3359958-3 11/14/18 13:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1030	1040	103	104	80.0-120			0.658	20

L1043056-10 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1043056-10 11/14/18 13:06 • (MS) R3359958-5 11/14/18 13:11 • (MSD) R3359958-6 11/14/18 13:13

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	221	1240	1250	102	103	1	75.0-125			0.753	20

Method Blank (MB)

(MB) R3358770-1 11/10/18 14:50

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron,Dissolved	U		12.6	200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3358770-2 11/10/18 14:53 • (LCSD) R3358770-3 11/10/18 14:55

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron,Dissolved	1000	1000	989	100	98.9	80.0-120			1.14	20

L1042719-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1042719-01 11/10/18 14:58 • (MS) R3358770-5 11/10/18 15:03 • (MSD) R3358770-6 11/10/18 15:06

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron,Dissolved	1000	ND	1130	1180	95.7	101	1	75.0-125			4.35	20

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

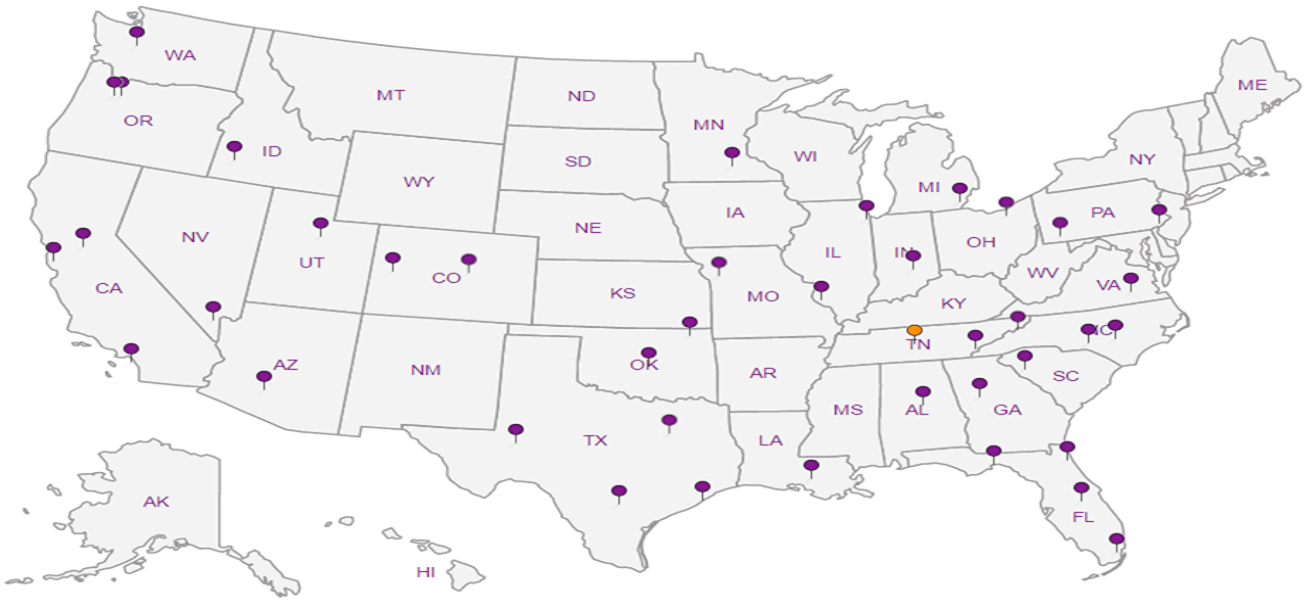
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
8575W. 110th Street
Overland Park, KS 66210

Billing Information:

Pres Chk

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

Pace Analytical®
National Center for Testing & Innovation

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1042995

C188

Report to: **Jason Franks**

Email To: **Jfranks@scsengineers.com**

Project Description: **KCP&L Sibley Generating Station**

City/State Collected: Sibley, MO

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project #

Lab Project #

Collected by (print): JASON FRANKS

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ✓ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Acctnum: **AQUAOPKS**
Template:
Prelogin:
TSR:
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron 250ml HDPE - HNO3	Diss Boron 250ml HDPE - HNO3	Remarks	Sample # (lab only)
ASD-1	Grab	GW	-	11/8/18	1120	2	X	X		-01
ASD-2	↓	GW	-		1220	2	X	X		02
ASD-3	↓	GW	-	↓	1320	2	X	X		03

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: RAD SCREEN: <0.5 mR/hr

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS ✓ FedEx __ Courier _____

Tracking # 4510 1661 7507

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11/8/18	1647	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 2.1/1.2.0 °C Bottles Received: 6 BR

Date: 11/9/18 Time: 845

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)