REPORT

2024 Annual Groundwater Monitoring and Corrective Action Report

SCPC Surface Impoundment, Sioux Energy Center, St. Charles County, Missouri, USA

January 31, 2025

Project Number: 23009-24

Submitted to:

Ameren Missouri
1901 Chouteau Avenue
St. Louis, Missouri 63103

Submitted by:

Rocksmith Geoengineering, LLC
2320 Creve Coeur Mill Rd
Maryland Heights, MO 63043

EXECUTIVE SUMMARY AND STATUS OF THE SCPC GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule" (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§ 257.90(e)). Ameren Missouri (Ameren) has determined that the Utility Waste Landfill (UWL) SCPC Surface Impoundment (or Cell 1) at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCPC describes CCR Rule groundwater monitoring activities from January 1, 2024 through December 31, 2024 including verification results related to late 2023 sampling.

Throughout 2024, the SCPC CCR unit has been operating under the Detection Monitoring Program (§257.94), which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. SSIs were determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

Table 1 - Summary of 2024 SCPC Sampling Events, Previous Year Verification, and Statistical Evaluations

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt	Parameters Collected	Verified SSIs	SSI Determination Date	ASD Completion Date
November 2023 Sampling Event	Detection Monitoring, November 10-13, 2023	December 27, 2023	Appendix III, Major Cations and Anions	**Boron:** UG-2 **TDS:** DG-4	March 26, 2024	June 24, 2024
	Verification Sampling, February 7, 2024	February 22, 2024	Detected Appendix III parameters (See Note 1)			
May 2024 Sampling Event	Detection Monitoring, May 28-30, 2024	July 9, 2024	Appendix III, Major Cations and Anions	**Chloride:** DG-3 **Sulfate:** DG-3	October 7, 2024	January 3, 2025
	Verification Sampling, July 29-30, 2024	August 12, 2024	Detected Appendix III parameters			
November 2024 Sampling Event	Detection Monitoring, November 14-20, 2024	December 23, 2024	Appendix III, Major Cations and Anions	To be determined after statistical analysis and Verification Sampling are completed in 2025.		

Notes:
1) Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
2) SSI – Statistically Significant Increase.
3) ASD – Alternative Source Demonstration.
4) TDS – Total Dissolved Solids.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or

resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Alternative Source Demonstrations (ASDs) were prepared for each of these sampling events and are discussed further in this Annual Report.

There were no changes made to the monitoring system in 2024 with no new wells being installed or decommissioned. CCR placement within the SCPC has ceased as of December 14, 2022 and CCR has since been routed to the newly constructed cell east of the SCPC called the SCPD. More information on the SCPD Cell is provided in the SCPD Annual Report. Closure of the SCPC was substantially completed in 2024, with a closure completion date of October 23, 2024. The unit is now closed; therefore, the SCPC has transitioned into the post-closure care requirements of the CCR Rule. As outlined in §257.104 of the CCR Rule, the monitoring system and programs must be maintained for at least 30 years after the completion of closure.

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1.0 INSTALLATION OR DECOMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPC. The groundwater monitoring system consists of 8 groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1** and is listed on **Table 2**, below. No new monitoring wells were installed or decommissioned in 2024 as a part of the CCR Rule monitoring program for the SCPC. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the SCPC. The SCPC was certified as closed on October 24, 2024; therefore, the unit is now subject to the Post-Closure Requirements of the CCR Rule (§257.104).

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCPC CCR Unit in 2024. **Table 2** below provides a summary of the groundwater samples collected in 2024 including the number of samples, the date of sample collection, and the monitoring program for which the samples were collected.

Table 2 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells								Monitoring Program
	BMW-1S	BMW-3S	UG-1A	UG-2	DG-1	DG-2	DG-3	DG-4	
	Date of Sample Collection								
February 2024 Verification Sampling	-	-	-	2/7/2024	2/7/2024	-	2/7/2024	-	Detection
May 2024 Sampling Event	5/28/2024	5/28/2024	5/30/2024	5/28/2024	5/30/2024	5/30/2024	5/30/2024	5/30/2024	Detection
July 2024 Verification Sampling	-	-	-	-	7/30/2024	7/30/2024	7/29/2024	-	Detection
November 2024 Sampling Event	11/20/2024	11/20/2024	11/15/2024	11/14/2024	11/15/2024	11/15/2024	11/15/2024	11/15/2024	Detection
Total Number of Samples Collected	2	2	3	3	4	3	4	2	NA

Notes:
1) Detection Monitoring events tested for Appendix III Parameters.
2) Only analytes/wells that were detected above the prediction limit were tested during verification sampling.
3) "-" No sample collected.
4) NA – Not applicable.
5) DG-1 and DG-3 were re-sampled in February 2024 following initial exceedances identified in November 2023. This occurred prior to updating prediction limits in March 2024 using data through May 2023. Using updated limits, the November 2023 results were no longer exceedances, and therefore, February 2024 verification results from DG-1 and DG-3 are not included in **Table 3**.

2.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed November 10-13, 2023. Verification sampling and the statistical analysis to evaluate for SSIs for the November 2023 event were not completed until 2024 and are

included in this report. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed February 7, 2024 and resulted in two SSIs. **Table 3** summarizes the results and statistical analysis of the November 2023 Detection Monitoring event. Laboratory analytical data from the February 2024 verification sampling event are provided in **Appendix A**. Laboratory Analytical data for the November 2023 Detection Monitoring event are provided in the 2023 Groundwater Monitoring and Corrective Action Annual Report for the SCPC.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An ASD was completed for the SSIs and are provided in **Appendix B**. This ASD demonstrates that the SSIs at monitoring well UG-2 and DG-4 are not caused by the SCPC CCR Unit, and therefore, the SCPC CCR Unit remains in Detection Monitoring.

Detection Monitoring samples were collected May 28-30, 2024, and testing was completed for all Appendix III analytes, as well as major cations and anions. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed July 29-30, 2024 and verified two SSIs. **Table 4** summarizes the results and statistical analysis of the May 2024 Detection Monitoring event. Laboratory analytical data from this sampling event is included in **Appendix A**. Similar to previous results, SSIs in the monitoring well network are not caused by the SCPC CCR unit, as demonstrated by the ASD provided in **Appendix C**.

A Detection Monitoring sampling event was completed November 14-20, 2024, and testing was completed for all Appendix III analytes, as well as major cations and anions. The statistical analysis to evaluate for SSIs in the November 2024 data was not completed in 2024 and the results will be provided in the 2025 Annual Report. **Table 5** summarizes the results of the November 2024 Detection Monitoring event, and laboratory analytical data from this event are provided in **Appendix A**.

2.2 Groundwater Elevation, Flow Rate and Direction

To meet the requirements of §257.93(c), water level measurements were taken at all monitoring wells prior to the start of groundwater purging and sampling. Static water levels were measured within a 24-hour period in each monitoring well using an electronic water level indicator.

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix D**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, which affect water levels, gradients and flow directions in these water bodies. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. At this facility, groundwater can flow north and south toward the Mississippi and Missouri Rivers, depending on river levels.

Groundwater flow direction and hydraulic gradient at the SEC were estimated for the alluvial aquifer wells using commercially available software to evaluate data since 2016. Results indicate that groundwater flow direction at the SEC is variable due to fluctuating river levels but has most often flowed from north to south. The overall net groundwater flow direction in the alluvial aquifer at the SEC was south-southeast in 2024 as a result of river levels in the Missouri and Mississippi Rivers. From 2016 through 2022, horizontal gradients ranged from 0.00006 to 0.001 feet/foot with an estimated net annual groundwater movement of approximately four feet per year in the prevailing downgradient direction. From July 2022 to February 2024, due to relatively low Missouri River levels, there was a more prevalent southward flow direction at a rate of approximately 43 feet per year. Based on water levels collected beginning in May 2024 throughout the rest of the year, groundwater flow varied north and south with a net eastward direction, averaging approximately 7 feet per year.

2.3 Sampling Issues

During updates to prediction limits in March 2024, the upper prediction limit for total dissolved solids at DG-4 was lowered below the November 2023 sample result. Because this occurred after the February 2024 verification sampling event, no verification sample was collected. This result was treated as an SSI, and an Alternative

Source Demonstration was produced for the November 2023 total dissolved solids result at well DG-4. No other notable sampling issues were encountered at the SCPC in 2024.

3.0 ACTIVITIES PLANNED FOR 2025

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2025. Statistical analysis of the November 2024 Detection Monitoring data will be completed in 2025 and will be included in the 2025 Annual Report. As outlined in the Statistical Analysis Plan for the site, updates to the statistical limits should be completed once four to eight new sample results are available. After the first semi-annual sampling event in 2025, there will be at least 4 new results for each Appendix III parameter. Therefore, background updates are planned to be completed in 2025.

Tables

Table 3
November 2023 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
November 2023 Detection Monitoring Event															
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.433 - 7.279	6.90	6.29 - 7.5	7.10	6.565 - 7.38	7.00	6.725 - 7.268	7.02	6.66 - 7.227	6.93	6.638 - 7.221	6.88
BORON, TOTAL	µg/L	57.9 J	58.9 J	453.4	165	277.7	1,700	118.3	107	113.2	82.0 J	103.2	81.9 J	114.1	105
CALCIUM, TOTAL	µg/L	136,000	114,000	203,439	157,000	143,772	119,000	174,000	138,000	166,000	133,000 J	169,490	160,000	166,717	154,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	147.8	74.8 J	93.74	12.9 J	10	2.5 J	10.93	2.3 J	17.26	8.2 J	155.7	12.4 J
FLUORIDE, TOTAL	mg/L	ND	ND	0.47	ND	0.34	ND	0.41	ND	0.49	ND	0.49	ND	0.48	ND
SULFATE, TOTAL	mg/L	46.9	12.3	113.4	52.7 J	93.63	0.79 J	69.58	19.4 J	68	35.2 J	74.45	65.1 J	79.91	63.3
TOTAL DISSOLVED SOLIDS	mg/L	475	398	819.5	672	657.3	483	552.3	549	537	505	617.9	594	680.5	732*
February 2024 Verification Sampling Event															
DATE	NA						2/7/2024								
pH	SU														
BORON, TOTAL	µg/L						1,360								
CALCIUM, TOTAL	µg/L														
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L														
TOTAL DISSOLVED SOLIDS	mg/L														

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. * - During updates to prediction limits completed in March 2024, the upper prediction limit for Total Dissolved Solids at DG-4 was lowered below the November 2023 sample result. Because this update occured after the February 2024 verification sampling event, no verification sample was collected. This result was treated as an SSI and an Alternative Source Demonstration was produced for Total Dissolved Solids at well DG-4.

Prepared By: GTM
Checked By: ANT
Reviewed By: MNH

Table 4
May 2024 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
May 2024 Detection Monitoring Event															
DATE	NA	5/28/2024	5/28/2024	NA	5/30/2024	NA	5/28/2024	NA	5/30/2024	NA	5/30/2024	NA	5/30/2024	NA	5/30/2024
pH	SU	6.86	6.95	6.433 - 7.279	7.04	6.29 - 7.5	7.04	6.565 - 7.38	7.13	6.725 - 7.268	7.09	6.66 - 7.227	7.06	6.638 - 7.221	6.99
BORON, TOTAL	µg/L	58.1 J	54.1 J	453.4	408	277.7	143	118.3	94.2 J	113.2	102	103.2	102	114.1	94.5 J
CALCIUM, TOTAL	µg/L	133,000	116,000	203,439	124,000	143,772	87,100	174,000	147,000 J	166,000	150,000	169,490	164,000	166,717	152,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	147.8	82.7	93.74	6.7	10.0	11.2 J	10.93	5.6	17.26	26.6	155.7	14.9
FLUORIDE, TOTAL	mg/L	ND	ND	0.47	ND	0.34	ND	0.41	0.16 J	0.49	ND	0.49	ND	0.48	ND
SULFATE, TOTAL	mg/L	37.7	19.7	113.4	92.3	93.63	35.8	69.58	64.7 J	68	95.4 J	74.45	75.8	79.91	65.2
TOTAL DISSOLVED SOLIDS	mg/L	470	529	819.5	667	657.3	335	552.3	531	537	574	617.9	591	680.5	597
July 2024 Verification Sampling Event															
DATE	NA								7/30/2024		7/30/2024		7/29/2024		
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L														
CHLORIDE, TOTAL	mg/L								8.9				34.0 J		
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L										43.9		83.3		
TOTAL DISSOLVED SOLIDS	mg/L										485				

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
8. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JTR
Checked By: JTA
Reviewed By: MNH

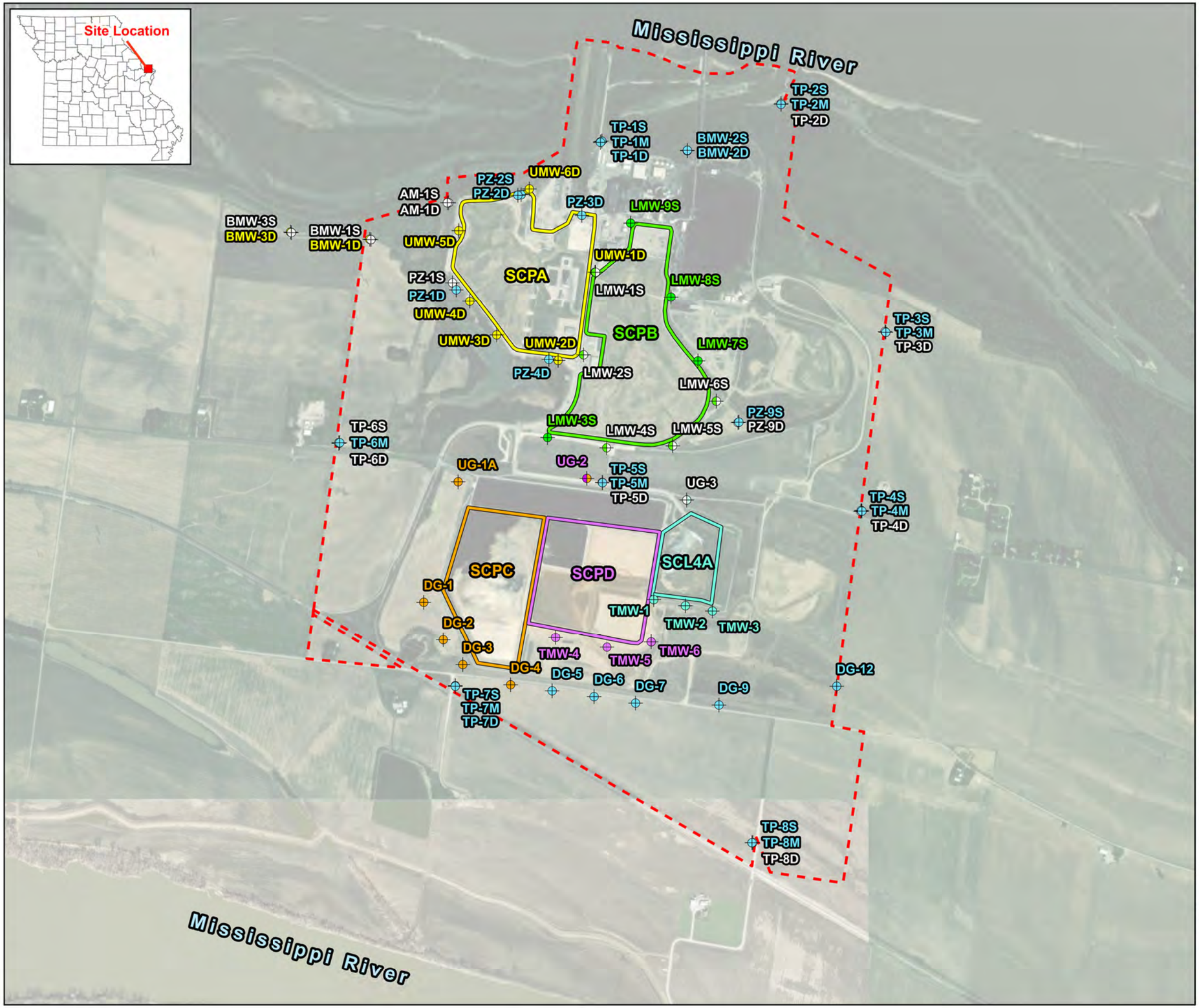
Table 5
November 2024 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS					
ANALYTE	UNITS	BMW-1S	BMW-3S	UG-1A	UG-2	DG-1	DG-2	DG-3	DG-4
November 2024 Detection Monitoring Event									
DATE	NA	11/20/2024	11/20/2024	11/15/2024	11/14/2024	11/15/2024	11/15/2024	11/15/2024	11/15/2024
pH	SU	6.57	6.72	6.75	7.08	7.12	6.96	6.90	6.75
BORON, TOTAL	µg/L	61.9 J	57.3 J	307	112	101	103	105	109
CALCIUM, TOTAL	µg/L	175,000	113,000	160,000	90,800	144,000	141,000	172,000	168,000
CHLORIDE, TOTAL	mg/L	14.2	13.1	116	26.5	7.5 J	4.5	14.7	13.0
FLUORIDE, TOTAL	mg/L	ND	ND	0.27	0.29	0.31	0.51	0.39 J	0.38
SULFATE, TOTAL	mg/L	37.1	17.1	60.0	29.4	50.5 J	41.5	85.5	70.4
TOTAL DISSOLVED SOLIDS	mg/L	613	413	711	409	541	522	627	665

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.

Prepared By: JTR
Checked By: VAH
Reviewed By: MNH

Figures



TITLE

SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

Legend

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)

Utility Waste Landfill Cells

- SCPC - FGD Surface Impoundment (Closed)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB and Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPC Detection Monitoring Well
- SCPD and SCPC Detection Monitoring Well
- SCPD Detection Monitoring Well
- SCL4A and Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements Only

NOTES

1. All boundaries and locations are approximate.
2. FGD - Flue Gas Desulfurization.
3. CCR - Coal Combustion Residuals.

REFERENCES

1. Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.

0 500 1,000 2,000 3,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

Ameren

ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2024-12-04
PREPARED	JSI	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1

Appendix A
Laboratory Analytical Data

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

February 22, 2024

Mark Haddock
Rocksmith Geoengineering, LLC.
2320 Creve Coeur Mill Road
Maryland Heights, MO 63043

RE: Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on February 09, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Lisa Meyer, Ameren
Grant Morey, Rocksmith Geoengineering, LLC.

Pace Analytical Services, LLC
9608 Loiret Blvd.
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CERTIFICATIONS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-5
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212023-1
Oklahoma Certification #: 2022-057
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-23-17
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60446937001	**S-UG-2**	Water	02/07/24 09:10	02/09/24 05:30
60446937002	**S-DG-1**	Water	02/07/24 11:30	02/09/24 05:30
60446937003	**S-DG-3**	Water	02/07/24 10:31	02/09/24 05:30
60446937004	**S-SCPC-DUP-1**	Water	02/07/24 00:00	02/09/24 05:30
60446937005	**S-SCPC-FB-1**	Water	02/07/24 09:08	02/09/24 05:30

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60446937001	**S-UG-2**	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K
60446937002	**S-DG-1**	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K
60446937003	**S-DG-3**	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K
60446937004	**S-SCPC-DUP-1**	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K
60446937005	**S-SCPC-FB-1**	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Sample: S-UG-2 **Lab ID: 60446937001** Collected: 02/07/24 09:10 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**1360**	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:32	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**511**	mg/L	10.0	10.0	1		02/12/24 11:06		AB

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Sample: S-DG-1 **Lab ID: 60446937002** Collected: 02/07/24 11:30 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**95.5J**	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:34	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**517**	mg/L	10.0	10.0	1		02/12/24 11:06		AB

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Sample: S-DG-3 **Lab ID: 60446937003** Collected: 02/07/24 10:31 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**95.2J**	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:36	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**543**	mg/L	10.0	10.0	1		02/14/24 11:27		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Sample: S-SCPC-DUP-1 **Lab ID: 60446937004** Collected: 02/07/24 00:00 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**98.6J**	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:43	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**492**	mg/L	10.0	10.0	1		02/14/24 11:28		

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Sample: S-SCPC-FB-1 **Lab ID: 60446937005** Collected: 02/07/24 09:08 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**<6.4**	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:45	7440-42-8	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		02/14/24 11:29		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

QC Batch: 883490
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60446937001, 60446937002, 60446937003, 60446937004, 60446937005

METHOD BLANK: 3497213 Matrix: Water
Associated Lab Samples: 60446937001, 60446937002, 60446937003, 60446937004, 60446937005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	02/20/24 09:05	

LABORATORY CONTROL SAMPLE: 3497214

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	970	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3497215 3497216

Parameter	Units	60446917001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	9030	1000	1000	9840	9900	81	87	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3497217 3497218

Parameter	Units	60446937003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	95.2J	1000	1000	1090	1080	99	98	70-130	1	20	

MATRIX SPIKE SAMPLE: 3497219

Parameter	Units	60446937005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	<6.4	1000	973	97	70-130	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

QC Batch: 882943
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60446937001, 60446937002

METHOD BLANK: 3495313 Matrix: Water
Associated Lab Samples: 60446937001, 60446937002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	31.5	5.0	5.0	02/12/24 10:58	AB,MW

LABORATORY CONTROL SAMPLE: 3495314

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1080	108	80-120	AB

SAMPLE DUPLICATE: 3495315

Parameter	Units	60446838002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	288	298	3	10	AB

SAMPLE DUPLICATE: 3495316

Parameter	Units	60446917001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1450	1140	23	10	AB,D6

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

QC Batch: 883190
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60446937003, 60446937004, 60446937005

METHOD BLANK: 3496105 Matrix: Water
Associated Lab Samples: 60446937003, 60446937004, 60446937005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	02/14/24 11:27	

LABORATORY CONTROL SAMPLE: 3496106

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	925	92	80-120	

SAMPLE DUPLICATE: 3496107

Parameter	Units	60446937003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	543	566	4	10	

SAMPLE DUPLICATE: 3496108

Parameter	Units	60447045001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	58.0	50.5	14	10	D6

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

AB	Analyte was detected in an associated instrument blank.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
MW	Due to matrix interference, achieving a constant weight is not possible.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC-VERIFICATION SAMP.
Pace Project No.: 60446937

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60446937001	**S-UG-2**	EPA 200.7	883490	EPA 200.7	883506
60446937002	**S-DG-1**	EPA 200.7	883490	EPA 200.7	883506
60446937003	**S-DG-3**	EPA 200.7	883490	EPA 200.7	883506
60446937004	**S-SCPC-DUP-1**	EPA 200.7	883490	EPA 200.7	883506
60446937005	**S-SCPC-FB-1**	EPA 200.7	883490	EPA 200.7	883506
60446937001	**S-UG-2**	SM 2540C	882943		
60446937002	**S-DG-1**	SM 2540C	882943		
60446937003	**S-DG-3**	SM 2540C	883190		
60446937004	**S-SCPC-DUP-1**	SM 2540C	883190		
60446937005	**S-SCPC-FB-1**	SM 2540C	883190		

WO# : 60446937

60446937

DC#_Title: ENV-FRM-LENE-0009_Sample C		
Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith Geoeng

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

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

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

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

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

Cooler Temperature (°C): **As-read** 1-2/1.5 **Corr. Factor** -0.3 **Corrected** 0.9/1.2

Date and initials of person examining contents: AN 4/19/24

Temperature should be above freezing to 6°C

Chain of Custody present:	☐Yes ☐No ☐N/A	
Chain of Custody relinquished:	☐Yes ☐No ☐N/A	
Samples arrived within holding time:	☐Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☐No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☐No ☐N/A	
Sufficient volume:	☐Yes ☐No ☐N/A	
Correct containers used:	☐Yes ☐No ☐N/A	
Pace containers used:	☐Yes ☐No ☐N/A	
Containers intact:	☐Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☐Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☐No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#: 67187	☐Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☐N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☐N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☐N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — **Required** Client Information:

Company:	Rocksmith Geoengineering, LLC
Address:	5233 Roanoke Drive, St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-5678	Fax:
Requested Due Date/TAT:	Standard

Section B — **Required** Project Information:

Report To:	Mark Haddock
Copy To:	Jeffery Ingram, Grant Morey
Purchase Order No.:	COC #2
Project Name:	Ameren SCPC - Verification Sampling
Project Number:	COC#2

Section C — Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15856, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D — **Required** Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Boron	Total Dissolved Solids									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N	N		
1	S-UG-2	WT	G			2-7-24	0910		2	1		1							✓	✓									
2	S-DG-1	WT	G			2-7-24	1130		2	1		1							✓	✓									
3	S-DG-3	WT	G			2-7-24	1031		2	1		1							✓	✓									
4	S-SCPC-DUP-1	WT	G			2-7-24	—		2	1		1							✓	✓									
5	S-SCPC-FB-1	WT	G			2-7-24	0908		2	1		1							✓	✓									
6	S-SCPC-MS-1	WT	G			2-7-24	1031		2	1		1							✓	✓									Collected @ S-DG-3
7	S-SCPC-MSD-1	WT	G			2-7-24	1031		2	1		1							✓	✓									"
8		WT	G																										
9		WT	G																										
10		WT	G																										
11		WT	G																										
12		WT	G																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
							Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature]	2-8-24	1340	[signature]	2/9	0530	1-2	X	Y	Y
							0-9	X	X	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 02/08/24

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

Client: Rocksmith

Profile # 15896-1

Site: EO Ameren SCPC-verification

Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																				8											
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Container Codes

Glass			
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass
		AG5U	100mL unpres amber glass

Plastic	
BP1C	1L NAOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn Acetate
BP2C	500mL NAOH plastic
BP2N	500mL HNO3 plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Acetate
BP3C	250mL NaOH plastic
BP3F	250mL HNO3 plastic - field filtered
BP3N	250mL HNO3 plastic
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Acetate
BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
WPDU	16oz unpresserved plstic

Misc.	
I	Wipe/Swab
SP5T	120mL Coliform Na Thiosulfate
ZPLC	Ziploc Bag
AF	Air Filter
C	Air Cassettes
R	Terracore Kit
U	Summa Can

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

Work Order Number: 60446937

Memorandum

March 19, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	Grant.Morey@Rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPC Verification – Data Package 60446937**		

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a compound was detected in a sample result between the Method Detection Limit (MDL) and Practical Quantification Limit (PQL), the results were recorded at the detection value and qualified as estimates (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC Verification
Project Number: 23009
Reviewer: G. Morey
Validation Date: 3/19/2024

Laboratory: Pace Analytical
SDG #: 60446937
Analytical Method (type and no.): EPA 200.7 (Boron); SM 2540C (Total Dissolved Solids)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-UG-2, S-DG-1, S-DG-3, S-SCPC-DUP-1, S-SCPC-FB-1

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			2/7/2024
b) Sampling team indicated?	x			ANT/GTM
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies:

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?		x		
g) Were any matrix problems noted?		x		

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See notes
b) Were analytes detected in the field blank(s)?		x		
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	x			
b) Were the proper analytes included in the LCS?	x			
c) Was the LCS accuracy criteria met?	x			

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			S-SCPC-DUP-1 @ S-DG-1
b) Were field dup. precision criteria met (note RPD)?	x			
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			See notes
d) Were lab dup. precision criteria met (note RPD)?		x		See notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?			x	
b) Was the %D within control limits?			x	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	x			
Recovery could not be calculated since sample contained high concentration of analyte?			x	
b) Was MSD accuracy criteria met?	x			
Recovery could not be calculated since sample contained high concentration of analyte?			x	
c) Were MS/MSD precision criteria met?	x			

Comments/Notes:

Blanks:

3495313: TDS detected in method/instrument blank (31.5). Associated with all samples -001 and -002. Results > RL and 10x blank, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Duplicates:

3495316: Lab duplicate RPD (23%) exceeds control limit for TDS, associated with unrelated sample, result qualified as estimate.

Lab duplicate max RPD: 10%: TDS

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 3/19/2024

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

July 09, 2024

Mark Haddock
Rocksmith Geoengineering, LLC.
2320 Creve Coeur Mill Road
Maryland Heights, MO 63043

RE: Project: AMEREN SCPC
Pace Project No.: 60453817

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between May 30, 2024 and June 01, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Lisa Meyer, Ameren
Grant Morey, Rocksmith Geoengineering, LLC.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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CERTIFICATIONS

Project: AMEREN SCPC
Pace Project No.: 60453817

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-6
Colorado Division of Oil and Public Safety
Iowa Certification #: 118
Kansas Field Laboratory Certification #: E-92587
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Missouri Inorganic Drinking Water Certification
Nevada Certification #: KS000212024-1
Oklahoma Certification #: 2023-073
Texas Certification #: T104704407-23-17
Utah Certification #: KS000212022-13

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SCPC
Pace Project No.: 60453817

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60453817001	**S-UG-2**	Water	05/28/24 13:25	05/30/24 05:35
60453817002	**S-UG-1A**	Water	05/30/24 16:10	06/01/24 07:05
60453817003	**S-DG-1**	Water	05/30/24 12:48	06/01/24 07:05
60453817004	**S-DG-2**	Water	05/30/24 13:51	06/01/24 07:05
60453817005	**S-DG-3**	Water	05/30/24 15:14	06/01/24 07:05
60453817006	**S-DG-4**	Water	05/30/24 11:11	06/01/24 07:05
60453817007	**S-SCPC-DUP-1**	Water	05/30/24 00:00	06/01/24 07:05
60453817008	**S-SCPC-FB-1**	Water	05/30/24 14:42	06/01/24 07:05
60453812001	**S-BMW-1S**	Water	05/28/24 11:35	05/30/24 05:35
60453812002	**S-BMW-3S**	Water	05/28/24 14:20	05/30/24 05:35

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60453817

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60453817001	**S-UG-2**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817002	**S-UG-1A**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817003	**S-DG-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817004	**S-DG-2**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817005	**S-DG-3**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817006	**S-DG-4**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817007	**S-SCPC-DUP-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453817008	**S-SCPC-FB-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453812001	**S-BMW-1S**	EPA 200.7	JXD	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
60453812002	**S-BMW-3S**	EPA 200.7	JXD	7	PASI-K

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60453817

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-UG-2 **Lab ID: 60453817001** Collected: 05/28/24 13:25 Received: 05/30/24 05:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**143**	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:53	7440-42-8	
Calcium	**87100**	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:53	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:53	7439-89-6	
Magnesium	**18100**	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:53	7439-95-4	
Manganese	**25.4**	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:53	7439-96-5	
Potassium	**4150**	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:53	7440-09-7	
Sodium	**8680**	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:53	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**272**	mg/L	20.0	10.5	1		06/06/24 15:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**335**	mg/L	10.0	10.0	1		06/03/24 13:07		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.7**	mg/L	1.0	0.53	1		06/13/24 05:13	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/24 05:13	16984-48-8	N2
Sulfate	**35.8**	mg/L	5.0	2.8	5		06/13/24 05:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-UG-1A **Lab ID: 60453817002** Collected: 05/30/24 16:10 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**408**	ug/L	100	6.4	1	06/11/24 09:35	06/12/24 11:51	7440-42-8	
Calcium	**124000**	ug/L	200	26.9	1	06/11/24 09:35	06/12/24 11:51	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	06/11/24 09:35	06/12/24 11:51	7439-89-6	
Magnesium	**29200**	ug/L	50.0	20.1	1	06/11/24 09:35	06/12/24 11:51	7439-95-4	
Manganese	**356**	ug/L	5.0	0.39	1	06/11/24 09:35	06/12/24 11:51	7439-96-5	
Potassium	**7700**	ug/L	500	69.7	1	06/11/24 09:35	06/12/24 11:51	7440-09-7	
Sodium	**49900**	ug/L	500	115	1	06/11/24 09:35	06/12/24 11:51	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**378**	mg/L	20.0	10.5	1		06/06/24 16:14		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**667**	mg/L	13.3	13.3	1		06/05/24 10:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**82.7**	mg/L	10.0	5.3	10		06/14/24 21:53	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/14/24 21:39	16984-48-8	N2
Sulfate	**92.3**	mg/L	10.0	5.5	10		06/14/24 21:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-DG-1 **Lab ID: 60453817003** Collected: 05/30/24 12:48 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**94.2J**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:10	7440-42-8	
Calcium	**147000**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:10	7440-70-2	M1,P6
Iron	**4640**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:10	7439-89-6	
Magnesium	**32400**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:10	7439-95-4	
Manganese	**365**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:10	7439-96-5	
Potassium	**6210**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:10	7440-09-7	
Sodium	**7330**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:10	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**539**	mg/L	20.0	10.5	1		06/06/24 16:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**531**	mg/L	10.0	10.0	1		06/05/24 10:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**11.2**	mg/L	1.0	0.53	1		06/17/24 18:29	16887-00-6	M1
Fluoride	**0.16J**	mg/L	0.20	0.12	1		06/17/24 18:29	16984-48-8	M1,N2
Sulfate	**64.7**	mg/L	10.0	5.5	10		06/17/24 19:18	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-DG-2 **Lab ID: 60453817004** Collected: 05/30/24 13:51 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**102**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:16	7440-42-8	
Calcium	**150000**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:16	7440-70-2	
Iron	**537**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:16	7439-89-6	
Magnesium	**35000**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:16	7439-95-4	
Manganese	**584**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:16	7439-96-5	
Potassium	**5730**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:16	7440-09-7	
Sodium	**5360**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:16	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**475**	mg/L	20.0	10.5	1		06/06/24 16:33		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**574**	mg/L	10.0	10.0	1		06/05/24 10:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.6**	mg/L	1.0	0.53	1		06/15/24 00:25	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 00:25	16984-48-8	N2
Sulfate	**95.4**	mg/L	10.0	5.5	10		06/15/24 00:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-DG-3 **Lab ID: 60453817005** Collected: 05/30/24 15:14 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**102**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:18	7440-42-8	
Calcium	**164000**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:18	7440-70-2	
Iron	**2910**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:18	7439-89-6	
Magnesium	**33100**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:18	7439-95-4	
Manganese	**767**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:18	7439-96-5	
Potassium	**5550**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:18	7440-09-7	
Sodium	**5820**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:18	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**464**	mg/L	20.0	10.5	1		06/06/24 16:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**591**	mg/L	10.0	10.0	1		06/05/24 10:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**26.6**	mg/L	5.0	2.6	5		06/15/24 01:34	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 01:20	16984-48-8	N2
Sulfate	**75.8**	mg/L	5.0	2.8	5		06/15/24 01:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-DG-4 **Lab ID: 60453817006** Collected: 05/30/24 11:11 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
	Pace Analytical Services - Kansas City								
Boron	**94.5J**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:20	7440-42-8	
Calcium	**152000**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:20	7440-70-2	
Iron	**91.9**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:20	7439-89-6	
Magnesium	**45300**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:20	7439-95-4	
Manganese	**860**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:20	7439-96-5	
Potassium	**6720**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:20	7440-09-7	
Sodium	**9640**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:20	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B								
	Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**544**	mg/L	20.0	10.5	1		06/06/24 16:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
	Pace Analytical Services - Kansas City								
Total Dissolved Solids	**597**	mg/L	13.3	13.3	1		06/05/24 12:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
	Pace Analytical Services - Kansas City								
Chloride	**14.9**	mg/L	1.0	0.53	1		06/15/24 01:48	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 01:48	16984-48-8	N2
Sulfate	**65.2**	mg/L	10.0	5.5	10		06/15/24 02:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-SCPC-DUP-1 **Lab ID: 60453817007** Collected: 05/30/24 00:00 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**104**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:27	7440-42-8	
Calcium	**157000**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:27	7440-70-2	
Iron	**545**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:27	7439-89-6	
Magnesium	**36600**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:27	7439-95-4	
Manganese	**610**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:27	7439-96-5	
Potassium	**5980**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:27	7440-09-7	
Sodium	**5420**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**478**	mg/L	20.0	10.5	1		06/06/24 16:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**614**	mg/L	10.0	10.0	1		06/05/24 12:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.5**	mg/L	1.0	0.53	1		06/15/24 02:16	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 02:16	16984-48-8	N2
Sulfate	**76.5**	mg/L	10.0	5.5	10		06/15/24 09:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-SCPC-FB-1 **Lab ID: 60453817008** Collected: 05/30/24 14:42 Received: 06/01/24 07:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**<6.4**	ug/L	100	6.4	1	06/06/24 15:48	06/10/24 09:29	7440-42-8	
Calcium	**<26.9**	ug/L	200	26.9	1	06/06/24 15:48	06/10/24 09:29	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	06/06/24 15:48	06/10/24 09:29	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	06/06/24 15:48	06/10/24 09:29	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	06/06/24 15:48	06/10/24 09:29	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	06/06/24 15:48	06/10/24 09:29	7440-09-7	
Sodium	**191J**	ug/L	500	115	1	06/06/24 15:48	06/10/24 09:29	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		06/06/24 17:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**24.0**	mg/L	5.0	5.0	1		06/05/24 12:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		06/15/24 09:19	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 09:19	16984-48-8	N2
Sulfate	**<0.55**	mg/L	1.0	0.55	1		06/15/24 09:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-BMW-1S **Lab ID: 60453812001** Collected: 05/28/24 11:35 Received: 05/30/24 05:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**58.1J**	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:09	7440-42-8	
Calcium	**133000**	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:09	7440-70-2	
Iron	**27.5J**	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:09	7439-89-6	
Magnesium	**25800**	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:09	7439-95-4	
Manganese	**606**	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:09	7439-96-5	
Potassium	**404J**	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:09	7440-09-7	
Sodium	**6070**	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:09	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**408**	mg/L	20.0	10.5	1		06/05/24 17:24		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**470**	mg/L	10.0	10.0	1		06/03/24 13:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**10.1**	mg/L	1.0	0.53	1		06/12/24 18:30	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/12/24 18:30	16984-48-8	N2
Sulfate	**37.7**	mg/L	10.0	5.5	10		06/12/24 18:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60453817

Sample: S-BMW-3S **Lab ID: 60453812002** Collected: 05/28/24 14:20 Received: 05/30/24 05:35 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**54.1J**	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:11	7440-42-8	
Calcium	**116000**	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:11	7440-70-2	
Iron	**33.4J**	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:11	7439-89-6	
Magnesium	**20500**	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:11	7439-95-4	
Manganese	**140**	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:11	7439-96-5	
Potassium	**618**	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:11	7440-09-7	
Sodium	**6410**	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:11	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**364**	mg/L	20.0	10.5	1		06/05/24 17:47		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**529**	mg/L	10.0	10.0	1		06/03/24 13:05		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**11.1**	mg/L	1.0	0.53	1		06/12/24 19:05	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/12/24 19:05	16984-48-8	N2
Sulfate	**19.7**	mg/L	1.0	0.55	1		06/12/24 19:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896847
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3549596 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453817001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/07/24 11:57	
Calcium	ug/L	<26.9	200	26.9	06/07/24 11:57	
Iron	ug/L	<9.1	50.0	9.1	06/07/24 11:57	
Magnesium	ug/L	<20.1	50.0	20.1	06/07/24 11:57	
Manganese	ug/L	<0.39	5.0	0.39	06/07/24 11:57	
Potassium	ug/L	<69.7	500	69.7	06/07/24 11:57	
Sodium	ug/L	<115	500	115	06/07/24 11:57	

LABORATORY CONTROL SAMPLE: 3549597

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	954	95	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10300	103	85-115	
Magnesium	ug/L	10000	9920	99	85-115	
Manganese	ug/L	1000	1040	104	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3549598 3549599

Parameter	Units	60453805002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	64.1J	1000	1000	1030	1020	96	96	70-130	1	20	
Calcium	ug/L	112000	10000	10000	122000	121000	99	91	70-130	1	20	
Iron	ug/L	8240	10000	10000	18500	18500	102	103	70-130	0	20	
Magnesium	ug/L	25600	10000	10000	35600	35100	100	96	70-130	1	20	
Manganese	ug/L	572	1000	1000	1610	1580	104	101	70-130	2	20	
Potassium	ug/L	3410	10000	10000	13600	13400	102	100	70-130	1	20	
Sodium	ug/L	6260	10000	10000	16300	16300	100	101	70-130	0	20	

MATRIX SPIKE SAMPLE: 3549600

Parameter	Units	60453812008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	113	1000	1060	95	70-130	
Calcium	ug/L	144000	10000	150000	62	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

MATRIX SPIKE SAMPLE: 3549600

Parameter	Units	60453812008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	33.4J	10000	10300	102	70-130	
Magnesium	ug/L	30000	10000	39100	91	70-130	
Manganese	ug/L	232	1000	1260	103	70-130	
Potassium	ug/L	2300	10000	12500	102	70-130	
Sodium	ug/L	5820	10000	16000	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 897040
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

METHOD BLANK: 3550459 Matrix: Water
Associated Lab Samples: 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/10/24 09:05	
Calcium	ug/L	<26.9	200	26.9	06/10/24 09:05	
Iron	ug/L	<9.1	50.0	9.1	06/10/24 09:05	
Magnesium	ug/L	<20.1	50.0	20.1	06/10/24 09:05	
Manganese	ug/L	<0.39	5.0	0.39	06/10/24 09:05	
Potassium	ug/L	<69.7	500	69.7	06/10/24 09:05	
Sodium	ug/L	<115	500	115	06/10/24 09:05	

LABORATORY CONTROL SAMPLE: 3550460

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	954	95	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Iron	ug/L	10000	10400	104	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1050	105	85-115	
Potassium	ug/L	10000	9950	99	85-115	
Sodium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3550461 3550462

Parameter	Units	60453817003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	94.2J	1000	1000	1040	1040	94	95	70-130	0	20	
Calcium	ug/L	147000	10000	10000	153000	153000	60	60	70-130	0	20	M1
Iron	ug/L	4640	10000	10000	14400	14600	97	100	70-130	2	20	
Magnesium	ug/L	32400	10000	10000	41700	41800	94	94	70-130	0	20	
Manganese	ug/L	365	1000	1000	1370	1350	101	98	70-130	2	20	
Potassium	ug/L	6210	10000	10000	16200	16100	99	99	70-130	0	20	
Sodium	ug/L	7330	10000	10000	16000	15900	87	85	70-130	1	20	

MATRIX SPIKE SAMPLE: 3550463

Parameter	Units	60453962001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	ND	1000	975	95	70-130	
Calcium	ug/L	16.9 mg/L	10000	27300	105	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

MATRIX SPIKE SAMPLE: 3550463

Parameter	Units	60453962001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	ND	10000	9960	99	70-130	
Magnesium	ug/L	3.9 mg/L	10000	13900	100	70-130	
Manganese	ug/L	ND	1000	1020	102	70-130	
Potassium	ug/L	4.7 mg/L	10000	14800	101	70-130	
Sodium	ug/L	16.5 mg/L	10000	26800	103	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 897579
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453817002

METHOD BLANK: 3553144 Matrix: Water
Associated Lab Samples: 60453817002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/12/24 11:06	
Calcium	ug/L	28.7J	200	26.9	06/12/24 11:06	
Iron	ug/L	<9.1	50.0	9.1	06/12/24 11:06	
Magnesium	ug/L	<20.1	50.0	20.1	06/12/24 11:06	
Manganese	ug/L	<0.39	5.0	0.39	06/12/24 11:06	
Potassium	ug/L	<69.7	500	69.7	06/12/24 11:06	
Sodium	ug/L	<115	500	115	06/12/24 11:06	

LABORATORY CONTROL SAMPLE: 3553145

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	952	95	85-115	
Calcium	ug/L	10000	10100	101	85-115	
Iron	ug/L	10000	9970	100	85-115	
Magnesium	ug/L	10000	9880	99	85-115	
Manganese	ug/L	1000	1030	103	85-115	
Potassium	ug/L	10000	9750	97	85-115	
Sodium	ug/L	10000	9980	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3553146 3553147

Parameter	Units	60453815004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5390	1000	1000	6320	6440	93	105	70-130	2	20	
Calcium	ug/L	235000	10000	10000	241000	248000	63	129	70-130	3	20	M1
Iron	ug/L	<9.1	10000	10000	9880	10100	99	101	70-130	2	20	
Magnesium	ug/L	58100	10000	10000	67400	69300	93	112	70-130	3	20	
Manganese	ug/L	1160	1000	1000	2140	2200	98	104	70-130	3	20	
Potassium	ug/L	5340	10000	10000	15100	15700	98	103	70-130	3	20	
Sodium	ug/L	68200	10000	10000	76900	78900	87	107	70-130	3	20	

MATRIX SPIKE SAMPLE: 3553149

Parameter	Units	60453812020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	56.9J	1000	1010	95	70-130	
Calcium	ug/L	117000	10000	126000	95	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

MATRIX SPIKE SAMPLE: 3553149

Parameter	Units	60453812020 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	7750	10000	17900	101	70-130	
Magnesium	ug/L	28700	10000	38300	96	70-130	
Manganese	ug/L	655	1000	1650	100	70-130	
Potassium	ug/L	3890	10000	13800	99	70-130	
Sodium	ug/L	6750	10000	16800	100	70-130	

SAMPLE DUPLICATE: 3554404

Parameter	Units	60453812018 Result	Dup Result	RPD	Max RPD	Qualifiers
Boron	ug/L	2700	2830	5	20	
Calcium	ug/L	109000	116000	6	20	
Iron	ug/L	7300	7630	4	19	
Magnesium	ug/L	27000	28700	6	20	
Manganese	ug/L	789	827	5	12	
Potassium	ug/L	3940	4200	6	20	
Sodium	ug/L	15900	16800	5	20	

SAMPLE DUPLICATE: 3554413

Parameter	Units	60453812020 Result	Dup Result	RPD	Max RPD	Qualifiers
Boron	ug/L	56.9J	54.3J		20	
Calcium	ug/L	117000	119000	2	20	
Iron	ug/L	7750	7690	1	19	
Magnesium	ug/L	28700	29300	2	20	
Manganese	ug/L	655	650	1	12	
Potassium	ug/L	3890	3860	1	20	
Sodium	ug/L	6750	6760	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896743
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453812001, 60453812002

METHOD BLANK: 3549169 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	06/05/24 16:02	

LABORATORY CONTROL SAMPLE: 3549170

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	518	104	90-110	

SAMPLE DUPLICATE: 3549171

Parameter	Units	60453805003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	265	265	0	10	

SAMPLE DUPLICATE: 3549172

Parameter	Units	60453812001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	408	413	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896832
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453817001, 60453817002, 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

METHOD BLANK: 3549490 Matrix: Water
Associated Lab Samples: 60453817001, 60453817002, 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	06/06/24 15:44	

LABORATORY CONTROL SAMPLE: 3549491

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	518	104	90-110	

SAMPLE DUPLICATE: 3549492

Parameter	Units	60453817003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	539	544	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896436
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3548054 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453817001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/03/24 13:04	

LABORATORY CONTROL SAMPLE: 3548055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	931	93	80-120	

SAMPLE DUPLICATE: 3548056

Parameter	Units	60453848004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3530	3930	11	10	D6,H1

SAMPLE DUPLICATE: 3548057

Parameter	Units	60453812008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	481	489	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896723 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453817002, 60453817003, 60453817004, 60453817005

METHOD BLANK: 3549074 Matrix: Water
Associated Lab Samples: 60453817002, 60453817003, 60453817004, 60453817005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/05/24 09:55	

LABORATORY CONTROL SAMPLE: 3549075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	946	95	80-120	

SAMPLE DUPLICATE: 3549078

Parameter	Units	60453815004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1150	1230	7	10	

SAMPLE DUPLICATE: 3549079

Parameter	Units	60453817003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	531	530	0	10	

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

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 896817
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453817006, 60453817007, 60453817008

METHOD BLANK: 3549433 Matrix: Water
Associated Lab Samples: 60453817006, 60453817007, 60453817008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/05/24 12:20	

LABORATORY CONTROL SAMPLE: 3549434

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	909	91	80-120	

SAMPLE DUPLICATE: 3549437

Parameter	Units	60453818005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	465	467	0	10	

SAMPLE DUPLICATE: 3549438

Parameter	Units	60453805003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	423	415	2	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 897826
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3554025 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453817001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/11/24 17:27	
Fluoride	mg/L	<0.12	0.20	0.12	06/11/24 17:27	N2
Sulfate	mg/L	<0.55	1.0	0.55	06/11/24 17:27	

LABORATORY CONTROL SAMPLE: 3554026

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	N2
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3554027 3554028

Parameter	Units	60453805001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.1	5	5	18.3	18.3	163	163	80-120	0	15	M1
Fluoride	mg/L	<0.12	2.5	2.5	4.5	4.5	180	179	80-120	0	15	M1,N2
Sulfate	mg/L	25.0	50	50	135	126	220	202	80-120	7	15	M1

MATRIX SPIKE SAMPLE: 3554029

Parameter	Units	60453812008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	7.8	5	12.5	94	80-120	
Fluoride	mg/L	<0.12	2.5	2.5	102	80-120	N2
Sulfate	mg/L	41.3	50	94.3	106	80-120	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

QC Batch: 898111
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453817002, 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

METHOD BLANK: 3555140 Matrix: Water
Associated Lab Samples: 60453817002, 60453817003, 60453817004, 60453817005, 60453817006, 60453817007, 60453817008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/14/24 14:16	
Fluoride	mg/L	<0.12	0.20	0.12	06/14/24 14:16	N2
Sulfate	mg/L	<0.55	1.0	0.55	06/14/24 14:16	

LABORATORY CONTROL SAMPLE: 3555141

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.6	105	90-110	N2
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3555143 3555144

Parameter	Units	60453815004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	113	250	250	406	451	117	135	80-120	11	15	M1
Fluoride	mg/L	<0.12	2.5	2.5	3.5	3.6	141	144	80-120	3	15	M1,N2
Sulfate	mg/L	475	250	250	799	892	130	167	80-120	11	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3555145 3555146

Parameter	Units	60453817003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.2	5	5	18.8	18.2	154	140	80-120	4	15	M1
Fluoride	mg/L	0.16J	2.5	2.5	4.9	4.4	189	170	80-120	10	15	M1,N2
Sulfate	mg/L	64.7	50	50	138	140	147	151	80-120	1	15	M1

SAMPLE DUPLICATE: 3555142

Parameter	Units	60453815004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	113	118	4	15	
Fluoride	mg/L	<0.12	<0.12		15	N2
Sulfate	mg/L	475	476	0	15	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60453817

SAMPLE DUPLICATE: 3555147

Parameter	Units	60453817003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	11.2	11.2	1	15	
Fluoride	mg/L	0.16J	<0.12		15	N2
Sulfate	mg/L	64.7	65.9	2	15	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN SCPC
Pace Project No.: 60453817

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
H1	Analysis conducted outside the EPA method holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
N2	The lab does not hold NELAC/TNI accreditation for this parameter but other accreditations/certifications may apply. A complete list of accreditations/certifications is available upon request.
P6	Matrix spike recovery was outside laboratory control limits due to a parent sample concentration notably higher than the spike level.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60453817

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60453812001	**S-BMW-1S**	EPA 200.7	896847	EPA 200.7	897011
60453812002	**S-BMW-3S**	EPA 200.7	896847	EPA 200.7	897011
60453817001	**S-UG-2**	EPA 200.7	896847	EPA 200.7	897011
60453817002	**S-UG-1A**	EPA 200.7	897579	EPA 200.7	897660
60453817003	**S-DG-1**	EPA 200.7	897040	EPA 200.7	897199
60453817004	**S-DG-2**	EPA 200.7	897040	EPA 200.7	897199
60453817005	**S-DG-3**	EPA 200.7	897040	EPA 200.7	897199
60453817006	**S-DG-4**	EPA 200.7	897040	EPA 200.7	897199
60453817007	**S-SCPC-DUP-1**	EPA 200.7	897040	EPA 200.7	897199
60453817008	**S-SCPC-FB-1**	EPA 200.7	897040	EPA 200.7	897199
60453812001	**S-BMW-1S**	SM 2320B	896743		
60453812002	**S-BMW-3S**	SM 2320B	896743		
60453817001	**S-UG-2**	SM 2320B	896832		
60453817002	**S-UG-1A**	SM 2320B	896832		
60453817003	**S-DG-1**	SM 2320B	896832		
60453817004	**S-DG-2**	SM 2320B	896832		
60453817005	**S-DG-3**	SM 2320B	896832		
60453817006	**S-DG-4**	SM 2320B	896832		
60453817007	**S-SCPC-DUP-1**	SM 2320B	896832		
60453817008	**S-SCPC-FB-1**	SM 2320B	896832		
60453812001	**S-BMW-1S**	SM 2540C	896436		
60453812002	**S-BMW-3S**	SM 2540C	896436		
60453817001	**S-UG-2**	SM 2540C	896436		
60453817002	**S-UG-1A**	SM 2540C	896723		
60453817003	**S-DG-1**	SM 2540C	896723		
60453817004	**S-DG-2**	SM 2540C	896723		
60453817005	**S-DG-3**	SM 2540C	896723		
60453817006	**S-DG-4**	SM 2540C	896817		
60453817007	**S-SCPC-DUP-1**	SM 2540C	896817		
60453817008	**S-SCPC-FB-1**	SM 2540C	896817		
60453812001	**S-BMW-1S**	EPA 300.0	897826		
60453812002	**S-BMW-3S**	EPA 300.0	897826		
60453817001	**S-UG-2**	EPA 300.0	897826		
60453817002	**S-UG-1A**	EPA 300.0	898111		
60453817003	**S-DG-1**	EPA 300.0	898111		
60453817004	**S-DG-2**	EPA 300.0	898111		
60453817005	**S-DG-3**	EPA 300.0	898111		
60453817006	**S-DG-4**	EPA 300.0	898111		
60453817007	**S-SCPC-DUP-1**	EPA 300.0	898111		
60453817008	**S-SCPC-FB-1**	EPA 300.0	898111		

REPORT OF LABORATORY ANALYSIS

WO#: 60453817

60453817

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sampl		
	Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith Geoeng

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

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

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

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

Thermometer Used: T249 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 2.2 **Corr. Factor** 0.0 **Corrected** 2.2

Date and initials of person examining contents: AV 5/30/24

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 67187	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Pace® Location Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

60453817

Scan QR Code for instructions

Company Name:	Rocksmith Geoengineering, LLC.	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC#14		
Project Name:	AMEREN SCPC	Invoice To:	Mark Haddock
		Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [ ] Yes [ ] No

Rush (Pre-approval required):
[ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other _____

DW PWSID # or WW Permit # as applicable:

Date Results Requested:

Field Filtered (if applicable): [ ] Yes [ ] No
Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Specify Container Size **: 3 1

Identify Container Preservative Type***: 2 1

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only:
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15856
Prelog / Bottle Ord. ID: EZ 3087014

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	200.7 Metals, Total	Cl/F/SO4/TDS/Alkalinity	Sample Comment	Preservation non-conformance identified for sample.
S-UG-1A	WT												
S-DG-1	WT												
S-DG-2	WT												
S-DG-3	WT												
S-DG-4	WT												
S-SCPC-DUP-1	WT												
S-SCPC-FB-1	WT												
~~S-SCPC-MS-1~~ S-BMW-15	WT				5-28-24	1135	2			✓	✓		
~~S-SCPC-MSD-1~~ S-BMW-35	WT				+	1420	2			✓	✓		
S-UG-2	WT	G			5-28-24	1325	2			✓	✓		

Additional Instructions from Pace®:
*** - App III and Cat/An Metals* - EPA 200.7: Ba, Ca, Fe, Mg, Mn, K, Na**

Collected By: (Printed Name) Grant Morey
Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:
1	TL99	0.0		2.2	

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
[illegible] / Rocksmith	5-29-24/1600	[signature]	5/30/24 0535
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

Tracking Number:

Delivered by: [ ] In- Person [ ] Courier
[ ] FedEx [ ] UPS [ ] Other

Page: 1 of 1

Client: Rocksmith Geoeng

Profile # 15856

Site:

Notes DO not log S-BMW-1s and S-BMW-3S.

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1																																
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10	WT																		1				1									
11																																
12																																

Container Codes

Glass			
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass
		AG5U	100mL unpres amber glass

Plastic	
BP1C	1L NAOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn Acetate
BP2C	500mL NAOH plastic
BP2N	500mL HNO3 plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Acetate
BP3C	250mL NaOH plastic
BP3F	250mL HNO3 plastic - field filtered
BP3N	250mL HNO3 plastic
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Acetate
BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
WPDU	16oz unpresserved plstic

Misc.	
I	Wipe/Swab
SP5T	120mL Coliform Na Thiosulfate
ZPLC	Ziploc Bag
AF	Air Filter
C	Air Cassettes
R	Terracore Kit
U	Summa Can

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

Work Order Number: 6045397

Pace Analytical Services	DC#_Title: ENV-FRM-LENE-0009_Sample Co...		
	Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith Geoeng

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

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

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

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

Thermometer Used: T299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 0.6/1.3 **Corr. Factor** 0.0 **Corrected** 0.6/1.3

Temperature should be above freezing to 6°C

Date and initials of person examining contents: PW 6/3/24

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 67187	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No / ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: ______ Date/Time: ______

Comments/ Resolution: ______

Project Manager Review: ______ Date: ______

Pace® Location Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

60453817

Scan QR Code for instructions

Company Name:	Rocksmith Geoengineering, LLC.	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC# 10		
Project Name:	AMEREN SCPC	Invoice To:	Mark Haddock
		Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables: [ ] Level II [ ] Level III [ ] Level IV [ ] EQUIS [ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [ ] Yes [ ] No

Rush (Pre-approval required): [ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other

DW PWSID # or WW Permit # as applicable:

Date Results Requested:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW),Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Specify Container Size **: 1 1 3

Identify Container Preservative Type***: 1 1 2

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only: Proj. Mgr: Jamie Church; AcctNum / Client ID:; Table #:; Profile / Template: 15856; Prelog / Bottle Ord. ID: EZ 3087014

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	200.7 Metals, Total	Cl/F/SO4/TDS/Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment	Preservation non-conformance identified for sample.
S-UG-1A	WT	G			5-30-24	1610	2			✓	✓	✓		
S-DG-1	WT	G			5-30-24	1248	2			✓	✓	✓		
S-DG-2	WT	G			1	1351	2			✓	✓	✓		
S-DG-3	WT	G			1	1514	2			✓	✓	✓		
S-DG-4	WT	G			5-30-24	1111	2			✓	✓	✓		
S-SCPC-DUP-1	WT	G			1	—	2			✓	✓	✓		
S-SCPC-FB-1	WT	G			1	1442	2			✓	✓	✓		
S-SCPC-MS-1	WT	G			5-30-24	1111	2			✓	✓	✓	Collected @ S-DG-1	
S-SCPC-MSD-1	WT	G			5-30-24	1111	2			✓	✓	✓	1	

Additional Instructions from Pace®:
*** - App III and Cat/An Metals* - EPA 200.7: Ba, Ca, Fe, Mg, Mn, K, Na**

Collected By: (Printed Name) Grant Marcy

Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:
2	T299	0.0	0.6	1.3	

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Rocksmith	5-31-24/1600		6/1/24 0705	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In- Person [ ] Courier [ ] FedEx [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

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Client: Rocksmith Geoeng

Profile #

Site:

Notes Append to 60453817

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																		1				1									
2	↓																		3				3									
3																			1				1									
4																			1				1									
5																			1				1									
6																			1				1									
7																			1				1									
8																																
9																																
10																																
11																																
12																																

Container Codes

Glass			
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass
		AG5U	100mL unpres amber glass

Plastic	
BP1C	1L NAOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn Acetate
BP2C	500mL NAOH plastic
BP2N	500mL HNO3 plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Acetate
BP3C	250mL NaOH plastic
BP3F	250mL HNO3 plastic - field filtered
BP3N	250mL HNO3 plastic
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Acetate
BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
WPDU	16oz unpresserved plstic

Misc.	
I	Wipe/Swab
SP5T	120mL Coliform Na Thiosulfate
ZPLC	Ziploc Bag
AF	Air Filter
C	Air Cassettes
R	Terracore Kit
U	Summa Can

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

Work Order Number: 60453817

Memorandum

August 7, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009-24
CC:	Mark Haddock, Jeffrey Ingram		
From:	Jack Rasmussen	**Email:**	Jack.Rasmussen@Rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPC – Data Package 60453817**		

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a compound was detected in a sample result between the Method Detection Limit (MDL) and Practical Quantification Limit (PQL), the results were recorded at the detection value and qualified as estimates (J).
- When a duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When a matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates based high, and J- for estimates based low).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC
Project Number: 23009-24
Reviewer: J. Rasmussen
Validation Date: 8/7/2024

Laboratory: Pace Analytical
SDG #: 60453817
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-UG-2, S-UG-1A, S-DG-1, S-DG-2, S-DG-3, S-DG-4, S-SCPC-DUP-1, S-SCPC-FB-1, S-BMW-1S, S-BMW-3S

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			05/28/2024 and 05/30/2024
b) Sampling team indicated?	x			GTM/JTA
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies:

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?		x		

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?	x			See Notes
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	x			
b) Were the proper analytes included in the LCS?	x			
c) Was the LCS accuracy criteria met?	x			

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			S-SCPC-DUP-1 @ S-DG-2
b) Were field dup. precision criteria met (note RPD)?		x		See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?		x		See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?			x	
b) Was the %D within control limits?			x	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
b) Was MSD accuracy criteria met?		x		See Notes
Recovery could not be calculated since sample contained high concentration of analyte?			x	
c) Were MS/MSD precision criteria met?	x			See Notes

Comments/Notes:

General:

Chloride and/or sulfate diluted in several samples, no qualifications necessary.

Method Blanks:

3553144: calcium (28.7J), associated with sample -002. Result > RL and 10x blank, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Field Blanks:

S-SCPC-FB-1 @ S-DG-3: sodium (191J), TDS (24.0). All results > RL and 10x blank, no qualification necessary.

Duplicate:

S-SCPC-DUP-1 @ S-DG-2: field duplicate RPD exceeds control limit (20%) for sulfate (21.9%), results qualified as estimates.

Lab duplicate max RPD: 10%: alkalinity, TDS: 15%: chloride, fluoride, sulfate; 20%: ferrous iron, sulfide, 200.7 metals.

3548056: Lab duplicate exceeds max RPD for TDS, associated with unrelated sample.

MS/MSD:

3549600: MS recovery low for calcium, associated with unrelated sample, no qualification necessary.

3550461/3550462: MS/MSD recovery low for calcium, associated with sample -003. Result qualified as estimate.

3553146/3553147: MS recovery low for calcium, MSD/RPD fall within control limits. Associated with sample -004, no qualification necessary.

3554027/3554028: MS/MSD recovery high for chloride, fluoride, sulfate. Associated with unrelated sample, no qualification necessary.

3555143/3555144: MSD recovery high for chloride, MS recovery and RPD within control limits, no qualification necessary.

MS/MSD recovery high for fluoride and sulfate, associated with unrelated sample, no qualification necessary.

3555145/3555146: MS/MSD recovery high for chloride, fluoride, sulfate. Associated with sample -003, results qualified as estimates.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-2	Sulfate	95.4	J	Field DUP RPD exceeds control limit
S-SCPC-DUP-1	"	76.5	J	"
S-DG-1	Calcium	147000	J-	MS/MSD recovery low
S-DG-1	Chloride	11.2	J+	MS/MSD recovery high
"	Fluoride	0.16	J+	"
"	Sulfate	64.7	J+	"

Signature: _____ Date: 08/07/2024

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

August 12, 2024

Mark Haddock
Rocksmith Geoengineering, LLC.
2320 Creve Coeur Mill Road
Maryland Heights, MO 63043

RE: Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 31, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Lisa Meyer, Ameren
Grant Morey, Rocksmith Geoengineering, LLC.

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-6
Colorado Division of Oil and Public Safety
Iowa Certification #: 118
Kansas Field Laboratory Certification #: E-92587
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Missouri Inorganic Drinking Water Certification
Nevada Certification #: KS000212024-1
Oklahoma Certification #: 2023-073
Texas Certification #: T104704407-23-17
Utah Certification #: KS000212022-13

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60457663001	**S-DG-1**	Water	07/30/24 10:45	07/31/24 07:07
60457663002	**S-DG-2**	Water	07/30/24 09:28	07/31/24 07:07
60457663003	**S-DG-3**	Water	07/29/24 13:53	07/31/24 07:07
60457663004	**S-SCPC-DUP-1**	Water	07/30/24 00:00	07/31/24 07:07
60457663005	**S-SCPC-FB-1**	Water	07/30/24 09:10	07/31/24 07:07

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60457663001	**S-DG-1**	SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	2	PASI-K
60457663002	**S-DG-2**	SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	2	PASI-K
60457663003	**S-DG-3**	SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	2	PASI-K
60457663004	**S-SCPC-DUP-1**	SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	2	PASI-K
60457663005	**S-SCPC-FB-1**	SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Sample: S-DG-1 **Lab ID: 60457663001** Collected: 07/30/24 10:45 Received: 07/31/24 07:07 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**486**	mg/L	10.0	10.0	1		07/31/24 09:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**8.9**	mg/L	1.0	0.53	1		08/07/24 03:20	16887-00-6	
Sulfate	**50.2**	mg/L	10.0	5.5	10		08/07/24 03:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Sample: S-DG-2 **Lab ID: 60457663002** Collected: 07/30/24 09:28 Received: 07/31/24 07:07 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**485**	mg/L	10.0	10.0	1		07/31/24 09:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.0**	mg/L	1.0	0.53	1		08/07/24 04:34	16887-00-6	
Sulfate	**43.9**	mg/L	10.0	5.5	10		08/07/24 04:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Sample: S-DG-3 **Lab ID: 60457663003** Collected: 07/29/24 13:53 Received: 07/31/24 07:07 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**573**	mg/L	10.0	10.0	1		07/31/24 09:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**34.0**	mg/L	5.0	2.6	5		08/07/24 05:10	16887-00-6	M1
Sulfate	**83.3**	mg/L	5.0	2.8	5		08/07/24 05:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Sample: S-SCPC-DUP-1 **Lab ID: 60457663004** Collected: 07/30/24 00:00 Received: 07/31/24 07:07 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**487**	mg/L	10.0	10.0	1		07/31/24 09:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**9.0**	mg/L	1.0	0.53	1		08/07/24 08:19	16887-00-6	
Sulfate	**52.6**	mg/L	10.0	5.5	10		08/07/24 08:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Sample: S-SCPC-FB-1 **Lab ID: 60457663005** Collected: 07/30/24 09:10 Received: 07/31/24 07:07 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		08/01/24 12:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		08/07/24 08:55	16887-00-6	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		08/07/24 08:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

QC Batch: 903652
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60457663001, 60457663002, 60457663003, 60457663004

METHOD BLANK: 3576269 Matrix: Water
Associated Lab Samples: 60457663001, 60457663002, 60457663003, 60457663004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/31/24 09:36	

LABORATORY CONTROL SAMPLE: 3576270

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	927	93	80-120	

SAMPLE DUPLICATE: 3576307

Parameter	Units	60457660002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1030	1030	1	10	

SAMPLE DUPLICATE: 3576332

Parameter	Units	60457662001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	440	465	6	10	

SAMPLE DUPLICATE: 3576333

Parameter	Units	60457663003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	573	574	0	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

QC Batch: 903859
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60457663005

METHOD BLANK: 3576975 Matrix: Water
Associated Lab Samples: 60457663005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	08/01/24 12:07	

LABORATORY CONTROL SAMPLE: 3576976

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	951	95	80-120	

SAMPLE DUPLICATE: 3576977

Parameter	Units	60457773001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	883	917	4	10	

SAMPLE DUPLICATE: 3576978

Parameter	Units	60457773005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1110	1130	2	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

QC Batch: 904194
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60457663001, 60457663002, 60457663003, 60457663004, 60457663005

METHOD BLANK: 3578340 Matrix: Water
Associated Lab Samples: 60457663001, 60457663002, 60457663003, 60457663004, 60457663005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	08/06/24 11:06	
Sulfate	mg/L	<0.55	1.0	0.55	08/06/24 11:06	

METHOD BLANK: 3580377 Matrix: Water
Associated Lab Samples: 60457663001, 60457663002, 60457663003, 60457663004, 60457663005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	08/08/24 09:44	
Sulfate	mg/L	<0.55	1.0	0.55	08/08/24 09:44	

LABORATORY CONTROL SAMPLE: 3578341

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

LABORATORY CONTROL SAMPLE: 3580378

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578342 3578343

Parameter	Units	60457658003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	28.2	50	50	61.9	64.6	67	73	80-120	4	15	M1
Sulfate	mg/L	52.3	50	50	96.2	105	88	106	80-120	9	15	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
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QUALITY CONTROL DATA

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578345 3578346

Parameter	Units	60457660002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	54.4	250	250	248	248	78	77	80-120	0	15	M1
Sulfate	mg/L	537	250	250	762	736	90	80	80-120	3	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578348 3578349

Parameter	Units	60457662001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	9.0	5	5	11.6	11.5	51	50	80-120	0	15	M1
Sulfate	mg/L	82.2	5	5	88.0	90.3	116	163	80-120	3	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578351 3578352

Parameter	Units	60457663003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	34.0	25	25	45.7	45.7	47	47	80-120	0	15	M1
Sulfate	mg/L	83.3	25	25	108	110	101	105	80-120	1	15	

SAMPLE DUPLICATE: 3578344

Parameter	Units	60457658003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	28.2	19.7	35	15	D6
Sulfate	mg/L	52.3	47.1	11	15	

SAMPLE DUPLICATE: 3578347

Parameter	Units	60457660002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	54.4	64.8	17	15	D6
Sulfate	mg/L	537	499	7	15	

SAMPLE DUPLICATE: 3578350

Parameter	Units	60457662001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	9.0	8.9	1	15	
Sulfate	mg/L	82.2	85.3	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

SAMPLE DUPLICATE: 3578353

Parameter	Units	60457663003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	34.0	31.9	7	15	
Sulfate	mg/L	83.3	81.7	2	15	

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

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
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QUALIFIERS

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC - VERIFICATION
Pace Project No.: 60457663

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60457663001	**S-DG-1**	SM 2540C	903652		
60457663002	**S-DG-2**	SM 2540C	903652		
60457663003	**S-DG-3**	SM 2540C	903652		
60457663004	**S-SCPC-DUP-1**	SM 2540C	903652		
60457663005	**S-SCPC-FB-1**	SM 2540C	903859		
60457663001	**S-DG-1**	EPA 300.0	904194		
60457663002	**S-DG-2**	EPA 300.0	904194		
60457663003	**S-DG-3**	EPA 300.0	904194		
60457663004	**S-SCPC-DUP-1**	EPA 300.0	904194		
60457663005	**S-SCPC-FB-1**	EPA 300.0	904194		

WO# : 60457663

60457663

DC#_Title: ENV-FRM-LENE-0009_Sample		
Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith Geo

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

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

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

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

Thermometer Used: T299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 1.4/1.0 **Corr. Factor** 0.6 **Corrected** 1.4/1.0

Date and initials of person examining contents: PV 7/31/24

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A — Required Client Information:

Company:	Rocksmith Geoengineering, LLC
Address:	5233 Roanoke Drive
	St. Charles, MO 63304
Email To:	mark.haddock@rocksmithgeo.com
Phone: 314-974-5678	Fax:
Requested Due Date/TAT:	Standard

Section B — Required Project Information:

Report To:	Mark Haddock
Copy To:	Jeffery Ingram, Grant Morey
Purchase Order No.:	COC #1
Project Name:	Ameren SCPC - Verification Sampling
Project Number:	COC#1

Section C — Invoice Information:

Attention:	
Company Name:	Rocksmith
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	15856, line 1

REGULATORY AGENCY

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

Site Location STATE: MO

Section D — Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test ↓ Y/N	Chloride	Sulfate	Total Dissolved Solids	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	S-DG-1	WT	G			7-30-24	1045		1	1									✓	✓	✓		60457663
2	S-DG-2	WT	G			7-30-24	0928		1	1									✓	✓	✓		
3	S-DG-3	WT	G			7-29-24	1353		1	1									✓	✓	✓		
4	S-SCPC-DUP-1	WT	G			7-30-24	—		1	1									✓	✓	✓		
5	S-SCPC-FB-1	WT	G			7-30-24	0910		1	1									✓	✓	✓		
6	S-SCPC-MS-1	WT	G			7-29-24	1353		1	1									✓	✓	✓		Collected @ S-DG-3
7	S-SCPC-MSD-1	WT	G			7-29-24	1353		1	1									✓	✓	✓		
8		WT	G																				
9		WT	G																				
10		WT	G																				
11		WT	G																				
12		WT	G																				

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Rocksmith	7-30-24	12:43		7/31	0707	1.4	Y	Y	Y
							1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 07/30/24

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

Client: Rocksmith Geo Profile/EZ # 15856-1

Site: Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3B	BP3Z	WPDU	ZPLC	Other		
1	WT																			1												
2	↓																			-												
3																				3			MS/MSD									
4																				-												
5																				1												
6																																
7																																
8																																
9																																
10																																
11																																
12																																

Container Codes

Glass				Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1B	1L NAOH plastic	I	Wipe/Swab
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar	BP1N	1L HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic	ZPLC	Ziploc Bag
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2B	500mL NAOH plastic	R	Terracore Kit
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic	U	Summa Can
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic		
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic		
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate	**Matrix**	
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3B	250mL NaOH plastic		
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered	WT	Water
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic	SL	Solid
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic	NAL	Non-aqueous Liquid
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic	OL	OIL
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate	WP	Wipe
				BP4U	125mL unpreserved plastic	DW	Drinking Water
				BP4N	125mL HNO3 plastic		
				BP4S	125mL H2SO4 plastic		
				WPDU	16oz unpresserved plstic		

Work Order Number: 60457663

Memorandum

August 14, 2024

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009-24
CC:	Mark Haddock, Jeffrey Ingram		
From:	Jack Rasmussen	**Email:**	jack.rasmussen@rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPC – Data Package 60457663**		

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates based high, and J- for estimates based low). When matrix spike recovery was less than 10%, and the associated sample result was a non-detect, the result was rejected (R).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC - Verification
Project Number: 23009-24
Reviewer: J. Rasmussen
Validation Date: 8/14/2024

Laboratory: Pace Analytical
SDG #: 60457663
Analytical Method (type and no.): SM 2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-DG-1, S-DG-2, S-DG-3, S-SCPC-DUP-1, S-SCPC-FB-1

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			7/29/2024 - 7/30/2024
b) Sampling team indicated?	x			GTM/JTR
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies: _____

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?	x			
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?		x		

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☐	☒	☐	
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper analytes included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	S-SCPC-DUP-1 @ S-DG-1
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	All RPD's within control limits
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☐	☒	☐	See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	☐	☐	☒	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

General:

Chloride and/or sulfate diluted in several samples, no qualifications necessary.

Duplicates:

Lab duplicate max RPD: 10%: TDS; 15%: chloride, sulfate.

3578344: Lab duplicate exceeds max RPD for chloride, associated with unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Duplicate continued:

3578347: Lab duplicate exceeds RPD for chloride, associated with unrelated sample, no qualification necessary.

MS/MSD:

3578342/3578343: MS and MSD recovery low for chloride, RPD okay. Associated with unrelated sample, no qualification necessary.

3578345/3578346: MS and MSD recovery low for chloride, RPD okay. Associated with unrelated sample, no qualification necessary.

3578348/3578349: MS and MSD recovery low for chloride, RPD okay. MSD recovery high for sulfate, MS and RPD okay.
Associated with unrelated sample, no qualification necessary.

3578351/3578352: MS and MSD recovery low for chloride, RPD okay. Associated with sample -003, result qualified as estimate.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-3	Chloride	34.0	J-	MS and MSD recovery low, RPD okay

Signature: _____ Date: 08/14/2024

Pace Analytical Services, LLC
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December 23, 2024

Mark Haddock
Rocksmith Geoengineering, LLC.
2320 Creve Coeur Mill Road
Maryland Heights, MO 63043

RE: Project: AMEREN SCPC
Pace Project No.: 60464704

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 15, 2024 and November 21, 2024. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

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

- Pace Analytical Services - Kansas City

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

Sincerely,

Jamie Church
jamie.church@pacelabs.com
314-838-7223
Project Manager

Enclosures

cc: Jeffrey Ingram, Rocksmith Geoengineering, LLC.
Lisa Meyer, Ameren
Grant Morey, Rocksmith Geoengineering, LLC.
Austin Nieman, Ameren

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN SCPC
Pace Project No.: 60464704

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Arkansas Certification #: 88-00679
Illinois Certification #: 2000302023-6
Colorado Division of Oil and Public Safety
Iowa Certification #: 118
Kansas Field Laboratory Certification #: E-92587
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Missouri Inorganic Drinking Water Certification
Nevada Certification #: KS000212024-1
Oklahoma Certification #: 2023-073
Texas Certification #: T104704407-23-17
Utah Certification #: KS000212022-13

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: AMEREN SCPC
Pace Project No.: 60464704

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60464704001	**S-UG-2**	Water	11/14/24 12:12	11/15/24 05:55
60464704002	**S-UG-1A**	Water	11/15/24 14:18	11/16/24 05:34
60464704003	**S-DG-1**	Water	11/15/24 09:42	11/16/24 05:34
60464704004	**S-DG-2**	Water	11/15/24 10:42	11/16/24 05:34
60464704005	**S-DG-3**	Water	11/15/24 11:56	11/16/24 05:34
60464704006	**S-DG-4**	Water	11/15/24 13:01	11/16/24 05:34
60464704007	**S-SCPC-DUP-1**	Water	11/15/24 08:00	11/16/24 05:34
60464704008	**S-SCPC-FB-1**	Water	11/15/24 12:10	11/16/24 05:34
60464699011	**S-BMW-1S**	Water	11/20/24 09:00	11/21/24 07:45
60464699012	**S-BMW-3S**	Water	11/20/24 11:43	11/21/24 07:45

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60464704

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60464704001	**S-UG-2**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704002	**S-UG-1A**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704003	**S-DG-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704004	**S-DG-2**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704005	**S-DG-3**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704006	**S-DG-4**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704007	**S-SCPC-DUP-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464704008	**S-SCPC-FB-1**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464699011	**S-BMW-1S**	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60464699012	**S-BMW-3S**	EPA 200.7	ARMN	7	PASI-K

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60464704

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-UG-2 **Lab ID: 60464704001** Collected: 11/14/24 12:12 Received: 11/15/24 05:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**112**	ug/L	100	6.4	1	11/18/24 09:30	12/04/24 12:53	7440-42-8	
Calcium	**90800**	ug/L	200	26.9	1	11/18/24 09:30	12/04/24 12:53	7440-70-2	
Iron	**10.9J**	ug/L	50.0	9.1	1	11/18/24 09:30	12/04/24 12:53	7439-89-6	
Magnesium	**18800**	ug/L	50.0	20.1	1	11/18/24 09:30	12/04/24 12:53	7439-95-4	
Manganese	**19.5**	ug/L	5.0	0.39	1	11/18/24 09:30	12/04/24 12:53	7439-96-5	
Potassium	**4560**	ug/L	500	69.7	1	11/18/24 09:30	12/04/24 12:53	7440-09-7	
Sodium	**36200**	ug/L	500	115	1	11/18/24 09:30	12/04/24 12:53	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**326**	mg/L	20.0	10.5	1		11/27/24 17:39		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**409**	mg/L	10.0	10.0	1		11/19/24 12:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**26.5**	mg/L	5.0	2.6	5		11/30/24 18:48	16887-00-6	
Fluoride	**0.29**	mg/L	0.20	0.12	1		11/30/24 18:35	16984-48-8	
Sulfate	**29.4**	mg/L	5.0	2.8	5		11/30/24 18:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-UG-1A **Lab ID: 60464704002** Collected: 11/15/24 14:18 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**307**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:14	7440-42-8	
Calcium	**160000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:14	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:14	7439-89-6	
Magnesium	**35700**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:14	7439-95-4	
Manganese	**400**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:14	7439-96-5	
Potassium	**11100**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:14	7440-09-7	
Sodium	**51700**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:14	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**425**	mg/L	20.0	10.5	1		11/27/24 18:53		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**711**	mg/L	13.3	13.3	1		11/20/24 12:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**116**	mg/L	10.0	5.3	10		11/30/24 14:44	16887-00-6	
Fluoride	**0.27**	mg/L	0.20	0.12	1		11/30/24 14:31	16984-48-8	
Sulfate	**60.0**	mg/L	10.0	5.5	10		11/30/24 14:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-DG-1 **Lab ID: 60464704003** Collected: 11/15/24 09:42 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**101**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:16	7440-42-8	
Calcium	**144000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:16	7440-70-2	
Iron	**5010**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:16	7439-89-6	
Magnesium	**31100**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:16	7439-95-4	
Manganese	**451**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:16	7439-96-5	
Potassium	**6030**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:16	7440-09-7	
Sodium	**5280**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:16	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**438**	mg/L	20.0	10.5	1		11/27/24 18:59		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**541**	mg/L	10.0	10.0	1		11/20/24 12:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.5**	mg/L	1.0	0.53	1		11/30/24 14:56	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.12	1		11/30/24 14:56	16984-48-8	
Sulfate	**50.5**	mg/L	5.0	2.8	5		11/30/24 15:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-DG-2 **Lab ID: 60464704004** Collected: 11/15/24 10:42 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**103**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:18	7440-42-8	
Calcium	**141000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:18	7440-70-2	
Iron	**1160**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:18	7439-89-6	
Magnesium	**31400**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:18	7439-95-4	
Manganese	**588**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:18	7439-96-5	
Potassium	**6370**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:18	7440-09-7	
Sodium	**4930**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:18	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**442**	mg/L	20.0	10.5	1		11/27/24 19:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**522**	mg/L	10.0	10.0	1		11/20/24 12:08		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.5**	mg/L	1.0	0.53	1		12/10/24 17:22	16887-00-6	
Fluoride	**0.51**	mg/L	0.20	0.12	1		12/10/24 17:22	16984-48-8	M0
Sulfate	**41.5**	mg/L	10.0	5.5	10		12/10/24 17:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-DG-3 **Lab ID: 60464704005** Collected: 11/15/24 11:56 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**105**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:29	7440-42-8	
Calcium	**172000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:29	7440-70-2	
Iron	**3160**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:29	7439-89-6	
Magnesium	**33400**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:29	7439-95-4	
Manganese	**990**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:29	7439-96-5	
Potassium	**5670**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:29	7440-09-7	
Sodium	**5810**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:29	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**474**	mg/L	20.0	10.5	1		11/27/24 19:18		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**627**	mg/L	13.3	13.3	1		11/20/24 12:09		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**14.7**	mg/L	1.0	0.53	1		11/30/24 16:01	16887-00-6	
Fluoride	**0.39**	mg/L	0.20	0.12	1		11/30/24 16:01	16984-48-8	
Sulfate	**85.5**	mg/L	5.0	2.8	5		11/30/24 16:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-DG-4 **Lab ID: 60464704006** Collected: 11/15/24 13:01 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**109**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:30	7440-42-8	
Calcium	**168000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:30	7440-70-2	
Iron	**50.3**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:30	7439-89-6	
Magnesium	**48700**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:30	7439-95-4	
Manganese	**1420**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:30	7439-96-5	
Potassium	**6920**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:30	7440-09-7	
Sodium	**6700**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:30	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**549**	mg/L	20.0	10.5	1		11/27/24 19:25		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**665**	mg/L	13.3	13.3	1		11/20/24 12:09		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**13.0**	mg/L	1.0	0.53	1		11/30/24 16:39	16887-00-6	
Fluoride	**0.38**	mg/L	0.20	0.12	1		11/30/24 16:39	16984-48-8	
Sulfate	**70.4**	mg/L	5.0	2.8	5		11/30/24 16:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-SCPC-DUP-1 **Lab ID: 60464704007** Collected: 11/15/24 08:00 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**100**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:32	7440-42-8	
Calcium	**148000**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:32	7440-70-2	M1
Iron	**5470**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:32	7439-89-6	
Magnesium	**31900**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:32	7439-95-4	
Manganese	**466**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:32	7439-96-5	
Potassium	**6280**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:32	7440-09-7	
Sodium	**5440**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:32	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**453**	mg/L	20.0	10.5	1		11/27/24 19:43		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**526**	mg/L	10.0	10.0	1		11/20/24 12:09		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.2**	mg/L	1.0	0.53	1		11/30/24 17:18	16887-00-6	
Fluoride	**0.32**	mg/L	0.20	0.12	1		11/30/24 17:18	16984-48-8	
Sulfate	**48.6**	mg/L	10.0	5.5	10		11/30/24 17:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-SCPC-FB-1 **Lab ID: 60464704008** Collected: 11/15/24 12:10 Received: 11/16/24 05:34 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**<6.4**	ug/L	100	6.4	1	11/18/24 13:51	12/04/24 16:36	7440-42-8	
Calcium	**35.9J**	ug/L	200	26.9	1	11/18/24 13:51	12/04/24 16:36	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	11/18/24 13:51	12/04/24 16:36	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	11/18/24 13:51	12/04/24 16:36	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	11/18/24 13:51	12/04/24 16:36	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	11/18/24 13:51	12/04/24 16:36	7440-09-7	
Sodium	**<115**	ug/L	500	115	1	11/18/24 13:51	12/04/24 16:36	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		11/27/24 19:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		11/20/24 12:10		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.53**	mg/L	1.0	0.53	1		11/30/24 17:44	16887-00-6	
Fluoride	**0.21**	mg/L	0.20	0.12	1		11/30/24 17:44	16984-48-8	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		11/30/24 17:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-BMW-1S **Lab ID: 60464699011** Collected: 11/20/24 09:00 Received: 11/21/24 07:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**61.9J**	ug/L	100	6.4	1	11/22/24 09:01	12/10/24 11:19	7440-42-8	
Calcium	**175000**	ug/L	200	26.9	1	11/22/24 09:01	12/10/24 11:19	7440-70-2	
Iron	**121**	ug/L	50.0	9.1	1	11/22/24 09:01	12/10/24 11:19	7439-89-6	
Magnesium	**33700**	ug/L	50.0	20.1	1	11/22/24 09:01	12/10/24 11:19	7439-95-4	
Manganese	**1070**	ug/L	5.0	0.39	1	11/22/24 09:01	12/10/24 11:19	7439-96-5	
Potassium	**450J**	ug/L	500	69.7	1	11/22/24 09:01	12/10/24 11:19	7440-09-7	
Sodium	**5690**	ug/L	500	115	1	11/22/24 09:01	12/10/24 11:19	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**347**	mg/L	20.0	10.5	1		12/02/24 16:57		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**613**	mg/L	13.3	13.3	1		11/27/24 17:56		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**14.2**	mg/L	1.0	0.53	1		12/14/24 17:32	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/14/24 17:32	16984-48-8	
Sulfate	**37.1**	mg/L	10.0	5.5	10		12/14/24 17:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60464704

Sample: S-BMW-3S **Lab ID: 60464699012** Collected: 11/20/24 11:43 Received: 11/21/24 07:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Boron	**57.3J**	ug/L	100	6.4	1	11/22/24 09:01	12/10/24 11:21	7440-42-8	
Calcium	**113000**	ug/L	200	26.9	1	11/22/24 09:01	12/10/24 11:21	7440-70-2	
Iron	**28.9J**	ug/L	50.0	9.1	1	11/22/24 09:01	12/10/24 11:21	7439-89-6	
Magnesium	**19800**	ug/L	50.0	20.1	1	11/22/24 09:01	12/10/24 11:21	7439-95-4	
Manganese	**268**	ug/L	5.0	0.39	1	11/22/24 09:01	12/10/24 11:21	7439-96-5	
Potassium	**452J**	ug/L	500	69.7	1	11/22/24 09:01	12/10/24 11:21	7440-09-7	
Sodium	**5840**	ug/L	500	115	1	11/22/24 09:01	12/10/24 11:21	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**166**	mg/L	20.0	10.5	1		12/02/24 17:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**413**	mg/L	10.0	10.0	1		11/27/24 17:57		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**13.1**	mg/L	1.0	0.53	1		12/14/24 18:00	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		12/14/24 18:00	16984-48-8	
Sulfate	**17.1**	mg/L	1.0	0.55	1		12/14/24 18:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 916731
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3630013 Matrix: Water
Associated Lab Samples: 60464704001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	11/27/24 15:29	
Calcium	ug/L	<26.9	200	26.9	11/27/24 15:29	
Iron	ug/L	<9.1	50.0	9.1	11/27/24 15:29	
Magnesium	ug/L	<20.1	50.0	20.1	11/27/24 15:29	
Manganese	ug/L	<0.39	5.0	0.39	11/27/24 15:29	
Potassium	ug/L	<69.7	500	69.7	11/27/24 15:29	
Sodium	ug/L	<115	500	115	11/27/24 15:29	

LABORATORY CONTROL SAMPLE: 3630019

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	906	91	85-115	
Calcium	ug/L	10000	9760	98	85-115	
Iron	ug/L	10000	10100	101	85-115	
Magnesium	ug/L	10000	9330	93	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	9480	95	85-115	
Sodium	ug/L	10000	9680	97	85-115	

MATRIX SPIKE SAMPLE: 3629944

Parameter	Units	60464294021 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	70.1J	1000	1030	96	70-130	
Calcium	ug/L	120000	10000	133000	134	70-130	M1
Iron	ug/L	5100	10000	15900	108	70-130	
Magnesium	ug/L	25900	10000	36200	103	70-130	
Manganese	ug/L	357	1000	1390	103	70-130	
Potassium	ug/L	4870	10000	14800	100	70-130	
Sodium	ug/L	13800	10000	24200	104	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3630020 3630021

Parameter	Units	60464667005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	140	1000	1000	1070	1080	93	94	70-130	1	20	
Calcium	ug/L	63600	10000	10000	72800	72700	92	91	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3630020 3630021

Parameter	Units	60464667005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	895	10000	10000	11500	11200	106	103	70-130	3	20	
Magnesium	ug/L	36200	10000	10000	45700	45600	95	93	70-130	0	20	
Manganese	ug/L	31.6	1000	1000	1050	1040	102	101	70-130	1	20	
Potassium	ug/L	21000	10000	10000	30600	31100	96	101	70-130	2	20	
Sodium	ug/L	280000	10000	10000	287000	289000	73	90	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 916806
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

METHOD BLANK: 3630185 Matrix: Water
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/04/24 16:03	
Calcium	ug/L	<26.9	200	26.9	12/04/24 16:03	
Iron	ug/L	<9.1	50.0	9.1	12/04/24 16:03	
Magnesium	ug/L	<20.1	50.0	20.1	12/04/24 16:03	
Manganese	ug/L	<0.39	5.0	0.39	12/04/24 16:03	
Potassium	ug/L	<69.7	500	69.7	12/04/24 16:03	
Sodium	ug/L	<115	500	115	12/04/24 16:03	

LABORATORY CONTROL SAMPLE: 3630186

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	932	93	85-115	
Calcium	ug/L	10000	10100	101	85-115	
Iron	ug/L	10000	10000	100	85-115	
Magnesium	ug/L	10000	9880	99	85-115	
Manganese	ug/L	1000	1030	103	85-115	
Potassium	ug/L	10000	9750	98	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3630187 3630188

Parameter	Units	60464704004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	103	1000	1000	1060	1040	96	94	70-130	2	20	
Calcium	ug/L	141000	10000	10000	150000	149000	97	79	70-130	1	20	
Iron	ug/L	1160	10000	10000	11500	11400	104	102	70-130	1	20	
Magnesium	ug/L	31400	10000	10000	40800	40400	94	91	70-130	1	20	
Manganese	ug/L	588	1000	1000	1610	1590	102	100	70-130	1	20	
Potassium	ug/L	6370	10000	10000	16400	16100	100	97	70-130	2	20	
Sodium	ug/L	4930	10000	10000	15100	14900	102	100	70-130	1	20	

MATRIX SPIKE SAMPLE: 3630189

Parameter	Units	60464704007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	100	1000	1060	96	70-130	
Calcium	ug/L	148000	10000	154000	60	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

MATRIX SPIKE SAMPLE: 3630189

Parameter	Units	60464704007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	5470	10000	15900	105	70-130	
Magnesium	ug/L	31900	10000	40600	86	70-130	
Manganese	ug/L	466	1000	1490	102	70-130	
Potassium	ug/L	6280	10000	16200	99	70-130	
Sodium	ug/L	5440	10000	15600	102	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917371
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3632816 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/10/24 11:09	
Calcium	ug/L	<26.9	200	26.9	12/10/24 11:09	
Iron	ug/L	<9.1	50.0	9.1	12/10/24 11:09	
Magnesium	ug/L	<20.1	50.0	20.1	12/10/24 11:09	
Manganese	ug/L	<0.39	5.0	0.39	12/10/24 11:09	
Potassium	ug/L	<69.7	500	69.7	12/10/24 11:09	
Sodium	ug/L	<115	500	115	12/10/24 11:09	

LABORATORY CONTROL SAMPLE: 3632817

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	972	97	85-115	
Calcium	ug/L	10000	10300	103	85-115	
Iron	ug/L	10000	10200	102	85-115	
Magnesium	ug/L	10000	10200	102	85-115	
Manganese	ug/L	1000	1070	107	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3632818 3632819

Parameter	Units	60464699019 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	56.8J	1000	1000	1040	1040	98	99	70-130	0	20	
Calcium	ug/L	115000	10000	10000	129000	127000	148	119	70-130	2	20	M1
Iron	ug/L	6100	10000	10000	16700	16700	106	106	70-130	0	20	
Magnesium	ug/L	27700	10000	10000	38800	37700	111	101	70-130	3	20	
Manganese	ug/L	395	1000	1000	1450	1440	106	105	70-130	1	20	
Potassium	ug/L	3270	10000	10000	13500	13600	103	104	70-130	1	20	
Sodium	ug/L	6960	10000	10000	17300	17200	104	103	70-130	1	20	

MATRIX SPIKE SAMPLE: 3632820

Parameter	Units	60464699018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	55.2J	1000	1050	99	70-130	
Calcium	ug/L	127000	10000	138000	110	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

MATRIX SPIKE SAMPLE: 3632820

Parameter	Units	60464699018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	8380	10000	19100	107	70-130	
Magnesium	ug/L	30800	10000	41500	106	70-130	
Manganese	ug/L	714	1000	1790	108	70-130	
Potassium	ug/L	4270	10000	14600	103	70-130	
Sodium	ug/L	7240	10000	17700	105	70-130	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917909
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464704001

METHOD BLANK: 3634992 Matrix: Water
Associated Lab Samples: 60464704001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/27/24 15:47	

LABORATORY CONTROL SAMPLE: 3634993

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	480	96	90-110	

SAMPLE DUPLICATE: 3634994

Parameter	Units	60464293013 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	343	347	1	10	

SAMPLE DUPLICATE: 3634995

Parameter	Units	60464699001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	337	339	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917910 — Analysis Method: SM 2320B
QC Batch Method: SM 2320B — Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

METHOD BLANK: 3634996 — Matrix: Water
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	11/27/24 18:31	

LABORATORY CONTROL SAMPLE: 3634997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	483	97	90-110	

SAMPLE DUPLICATE: 3634998

Parameter	Units	60464704004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	442	443	0	10	

SAMPLE DUPLICATE: 3634999

Parameter	Units	60464795002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	424	415	2	10	

SAMPLE DUPLICATE: 3635000

Parameter	Units	60464769007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	351	351	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 918131
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3635814 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	12/02/24 16:17	

LABORATORY CONTROL SAMPLE: 3635815

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	487	97	90-110	

SAMPLE DUPLICATE: 3635816

Parameter	Units	60464699019 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	306	306	0	10	

SAMPLE DUPLICATE: 3635817

Parameter	Units	60465156001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	329	347	5	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 916954
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3630622 Matrix: Water
Associated Lab Samples: 60464704001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/19/24 12:16	

LABORATORY CONTROL SAMPLE: 3630623

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

SAMPLE DUPLICATE: 3630624

Parameter	Units	60464559003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	140	140	0	10	

SAMPLE DUPLICATE: 3630625

Parameter	Units	60464294022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	647	664	3	10	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917114 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

METHOD BLANK: 3631336 Matrix: Water
Associated Lab Samples: 60464704002, 60464704003, 60464704004, 60464704005, 60464704006, 60464704007, 60464704008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/20/24 12:07	

LABORATORY CONTROL SAMPLE: 3631337

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

SAMPLE DUPLICATE: 3631338

Parameter	Units	60464704004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	522	529	1	10	

SAMPLE DUPLICATE: 3631347

Parameter	Units	60464795002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1870	1820	3	10	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917911
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3635001 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/27/24 17:56	

LABORATORY CONTROL SAMPLE: 3635002

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 3635003

Parameter	Units	60464699019 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	494	499	1	10	

SAMPLE DUPLICATE: 3635004

Parameter	Units	60465156001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	460	452	2	10	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 917888
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464704001, 60464704002, 60464704003, 60464704005, 60464704006, 60464704007, 60464704008

METHOD BLANK: 3634901 Matrix: Water
Associated Lab Samples: 60464704001, 60464704002, 60464704003, 60464704005, 60464704006, 60464704007, 60464704008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	11/30/24 10:23	
Fluoride	mg/L	<0.12	0.20	0.12	11/30/24 10:23	
Sulfate	mg/L	<0.55	1.0	0.55	11/30/24 10:23	

LABORATORY CONTROL SAMPLE: 3634902

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE SAMPLE: 3634908

Parameter	Units	60464704008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	<0.53	5	5.3	97	80-120	
Fluoride	mg/L	0.21	2.5	2.9	108	80-120	
Sulfate	mg/L	<0.55	5	5.9	119	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 919032
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704004

METHOD BLANK: 3639774 Matrix: Water
Associated Lab Samples: 60464704004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/10/24 16:56	
Fluoride	mg/L	<0.12	0.20	0.12	12/10/24 16:56	
Sulfate	mg/L	<0.55	1.0	0.55	12/10/24 16:56	

LABORATORY CONTROL SAMPLE: 3639775

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3639788 3639789

Parameter	Units	60464704004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	4.5	5	5	9.5	9.7	100	104	80-120	2	15	
Fluoride	mg/L	0.51	2.5	2.5	3.5	3.6	119	123	80-120	3	15	M0
Sulfate	mg/L	41.5	50	50	92.5	93.4	102	104	80-120	1	15	

SAMPLE DUPLICATE: 3639790

Parameter	Units	60464704004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	4.5	4.5	1	15	
Fluoride	mg/L	0.51	0.51	0	15	
Sulfate	mg/L	41.5	42.0	1	15	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60464704

QC Batch: 919641
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3642615 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/14/24 04:07	
Fluoride	mg/L	<0.12	0.20	0.12	12/14/24 04:07	CL
Sulfate	mg/L	<0.55	1.0	0.55	12/14/24 04:07	

LABORATORY CONTROL SAMPLE: 3642616

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.3	92	90-110	CL
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3642617 3642618

Parameter	Units	60464769007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.6	5	5	10.9	9.8	107	85	80-120	11	15	
Fluoride	mg/L	<0.12	2.5	2.5	3.8	3.1	151	126	80-120	18	15	CL,M1, R1
Sulfate	mg/L	33.6	50	50	92.1	100	117	133	80-120	8	15	M1

MATRIX SPIKE SAMPLE: 3642620

Parameter	Units	60464769012 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.6	5	16.1	72	80-120	M1
Fluoride	mg/L	<0.12	2.5	3.0	120	80-120	
Sulfate	mg/L	19.7	50	72.0	105	80-120	

SAMPLE DUPLICATE: 3642619

Parameter	Units	60464769007 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	5.6	5.6	0	15	
Fluoride	mg/L	<0.12	<0.12		15	CL
Sulfate	mg/L	33.6	31.7	6	15	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN SCPC
Pace Project No.: 60464704

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
M0	Matrix spike recovery and/or matrix spike duplicate recovery was outside laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60464704

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60464704001	**S-UG-2**	EPA 200.7	916731	EPA 200.7	916791
60464704002	**S-UG-1A**	EPA 200.7	916806	EPA 200.7	916863
60464704003	**S-DG-1**	EPA 200.7	916806	EPA 200.7	916863
60464704004	**S-DG-2**	EPA 200.7	916806	EPA 200.7	916863
60464704005	**S-DG-3**	EPA 200.7	916806	EPA 200.7	916863
60464704006	**S-DG-4**	EPA 200.7	916806	EPA 200.7	916863
60464704007	**S-SCPC-DUP-1**	EPA 200.7	916806	EPA 200.7	916863
60464704008	**S-SCPC-FB-1**	EPA 200.7	916806	EPA 200.7	916863
60464699011	**S-BMW-1S**	EPA 200.7	917371	EPA 200.7	917460
60464699012	**S-BMW-3S**	EPA 200.7	917371	EPA 200.7	917460
60464704001	**S-UG-2**	SM 2320B	917909		
60464704002	**S-UG-1A**	SM 2320B	917910		
60464704003	**S-DG-1**	SM 2320B	917910		
60464704004	**S-DG-2**	SM 2320B	917910		
60464704005	**S-DG-3**	SM 2320B	917910		
60464704006	**S-DG-4**	SM 2320B	917910		
60464704007	**S-SCPC-DUP-1**	SM 2320B	917910		
60464704008	**S-SCPC-FB-1**	SM 2320B	917910		
60464699011	**S-BMW-1S**	SM 2320B	918131		
60464699012	**S-BMW-3S**	SM 2320B	918131		
60464704001	**S-UG-2**	SM 2540C	916954		
60464704002	**S-UG-1A**	SM 2540C	917114		
60464704003	**S-DG-1**	SM 2540C	917114		
60464704004	**S-DG-2**	SM 2540C	917114		
60464704005	**S-DG-3**	SM 2540C	917114		
60464704006	**S-DG-4**	SM 2540C	917114		
60464704007	**S-SCPC-DUP-1**	SM 2540C	917114		
60464704008	**S-SCPC-FB-1**	SM 2540C	917114		
60464699011	**S-BMW-1S**	SM 2540C	917911		
60464699012	**S-BMW-3S**	SM 2540C	917911		
60464704001	**S-UG-2**	EPA 300.0	917888		
60464704002	**S-UG-1A**	EPA 300.0	917888		
60464704003	**S-DG-1**	EPA 300.0	917888		
60464704004	**S-DG-2**	EPA 300.0	919032		
60464704005	**S-DG-3**	EPA 300.0	917888		
60464704006	**S-DG-4**	EPA 300.0	917888		
60464704007	**S-SCPC-DUP-1**	EPA 300.0	917888		
60464704008	**S-SCPC-FB-1**	EPA 300.0	917888		
60464699011	**S-BMW-1S**	EPA 300.0	919641		
60464699012	**S-BMW-3S**	EPA 300.0	919641		

WO# : 60464704

60464704

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sample Con		
	Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith Geoeng

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

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

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

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

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

Cooler Temperature (°C): **As-read** 1.1 **Corr. Factor** -0.1 **Corrected** 1.0

Date and initials of person examining contents: AM 11/15/24

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 88727	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace® Location Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd , Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

Company Name:	Rocksmith Geoengineering, LLC	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC# 10		
Project Name:	AMEREN SCPC	Invoice To:	Mark Haddock
		Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables: [ ] Level II [ ] Level III [ ] Level IV [ ] EQUIS [ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [ ] Yes [ ] No

Rush (Pre-approval required): [ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other _____

DW PWSID # or WW Permit # as applicable:

Date Results Requested:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW), Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Specify Container Size **: 3 1 3

Identify Container Preservative Type***: 2 1 2

Analysis Requested

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	200.7 Metals, Total	Cl/F/SO4/TDS/Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment
S-UG-1A	WT												
S-DG-1	WT												
S-DG-2	WT												
S-DG-3	WT												
S-DG-4	WT												
S-SCPC-DUP-1	WT												
S-SCPC-FB-1	WT												
S-SCPC-MS-1	WT												
S-SCPC-MSD-1	WT												
S-UG-2	WT	G			11-14-24	1212	2			✓	✓	✓	

Lab Use Only

Proj. Mgr: Jamie Church

AcctNum / Client ID:

Table #:

Profile / Template: 15856

Prelog / Bottle Ord. ID: EZ 3163158

Preservation non-conformance identified for sample

** Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: Ba, Ca, Fe, Mg, Mn, K, Na

Collected By: (Printed Name) Grant Morey

Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:
1	T298	-0.1	1.1	1.0	

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
[illegible] / Rocksmith	11-14-24/1400	[illegible] BASE	11/15/24 05:55	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In-Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

Client: Rocksmith Geoeng Profile(EZ #) 3163158

Site: Notes

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3B	BP3Z	WPDU	ZPLC	Other		
1																																
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10	WT																		1				1									
11																																
12																																

Container Codes

Glass			
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass
		AG5U	100mL unpres amber glass

Plastic	
BP1B	1L NAOH plastic
BP1N	1L HNO3 plastic
BP1S	1L H2SO4 plastic
BP1U	1L unpreserved plastic
BP1Z	1L NaOH, Zn Acetate
BP2B	500mL NAOH plastic
BP2N	500mL HNO3 plastic
BP2S	500mL H2SO4 plastic
BP2U	500mL unpreserved plastic
BP2Z	500mL NaOH, Zn Acetate
BP3B	250mL NaOH plastic
BP3F	250mL HNO3 plastic - field filtered
BP3N	250mL HNO3 plastic
BP3U	250mL unpreserved plastic
BP3S	250mL H2SO4 plastic
BP3Z	250mL NaOH, Zn Acetate
BP4U	125mL unpreserved plastic
BP4N	125mL HNO3 plastic
BP4S	125mL H2SO4 plastic
WPDU	16oz unpresserved plstic

Misc.	
I	Wipe/Swab
SP5T	120mL Coliform Na Thiosulfate
ZPLC	Ziploc Bag
AF	Air Filter
C	Air Cassettes
R	Terracore Kit
U	Summa Can

Matrix	
WT	Water
SL	Solid
NAL	Non-aqueous Liquid
OL	OIL
WP	Wipe
DW	Drinking Water

Work Order Number: 6c464704

WO# : 60464704

60464704

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sample C		
	Revision: 2	Effective Date: 01/12/2022	Issued By: Lenexa

Client Name: Rocksmith

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

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

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

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

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

Cooler Temperature (°C): **As-read** 2.0 **Corr. Factor** -0.1 **Corrected** 1.9/0.9

Date and initials of person examining contents: MM 11/16/24

Temperature should be above freezing to 6°C 1.0

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☑No ☐N/A	
Filtered volume received for dissolved tests?	☐Yes ☑No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 88727	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☑No ☐N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☑No ☐N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace® Location Requested (City/State):
Pace Analytical Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

LAB USE ONLY- Affix Workorder/Login Label Here

60464704

Scan QR Code for instructions

Company Name:	Rocksmith Geoengineering, LLC	Contact/Report To:	Mark Haddock
Street Address	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC# 10		
Project Name:	AMEREN SCPC	Invoice To:	Mark Haddock
		Invoice E-Mail:	mark haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET

County / State origin of sample(s): Missouri

Data Deliverables:
[ ] Level II [ ] Level III [ ] Level IV
[ ] EQUIS
[ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [ ] Yes [ ] No

Rush (Pre-approval required):
[ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other

DW PWSID # or WW Permit # as applicable

Date Results Requested:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

Specify Container Size **

Identify Container Preservative Type***

Analysis Requested

**Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only

Proj. Mgr: Jamie Church

AcctNum / Client ID:

Table #:

Profile / Template: 15856

Prelog / Bottle Ord. ID: EZ 3163158

Preservation non-conformance identified for sample

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW), Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	200.7 Metals, Total	Cl/F/SO4/TDS/Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment
S-UG-1A	WT	G			11/16/24	1418	2			✓	✓	✓	
S-DG-1	WT	G			11/15/24	0942	2			✓	✓	✓	
S-DG-2	WT	G			11/15/24	1042	2			✓	✓	✓	
S-DG-3	WT	G			11/15/24	1156	2			✓	✓	✓	
S-DG-4	WT	G			11/15/24	1301	2			✓	✓	✓	
S-SCPC-DUP-1	WT	G			11/15/24	—	2			✓	✓	✓	
S SCPC-FB-1	WT	G			11/15/24	1210	2			✓	✓	✓	
S-SCPC-MS-1	WT	G			11/15/24	1042	2			✓	✓	✓	
S-SCPC-MSD-1	WT	G			11/15/24	1042	2			✓	✓	✓	

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: Ba, Ca, Fe, Mg, Mn, K, Na

Collected By: (Printed Name) John Rasmussen

Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers:	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:
	T298	-0.1	1.0	0.9	

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Rocksmith	11/15/24 1510		11-16 0534	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by: [ ] In- Person [ ] Courier
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	[ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

Client: Rocksmith Profile/EZ #

Site: Notes Applied to 60464704

COC Line Item	Matrix	VG9H	DG9H	DG9Q	VG9U	DG9U	DG9M	DG9B	BG1U	AG1H	AG1U	AG2U	AG3S	AG4U	AG5U	JGFU	WGKU	WGDU	BP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3B	BP3Z	WPDU	ZPLC	Other		
1	WT																		1				1									
2	1																		1				1									
3																			3				3									
4																			1				1									
5																			1				1									
6																			1				1									
7	↓																		1				1									
8																																
9																																
10																																
11																																
12		-																														

Container Codes

Glass				Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1B	1L NAOH plastic	I	Wipe/Swab
DG9H	40mL HCl amber voa vial	WGFU	4oz clear soil jar	BP1N	1L HNO3 plastic	SP5T	120mL Coliform Na Thiosulfate
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic	ZPLC	Ziploc Bag
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic	AF	Air Filter
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate	C	Air Cassettes
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2B	500mL NAOH plastic	R	Terracore Kit
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic	U	Summa Can
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic		
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic		
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate	Matrix	
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3B	250mL NaOH plastic		
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered	WT	Water
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic	SL	Solid
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic	NAL	Non-aqueous Liquid
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic	OL	OIL
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate	WP	Wipe
				BP4U	125mL unpreserved plastic	DW	Drinking Water
				BP4N	125mL HNO3 plastic		
				BP4S	125mL H2SO4 plastic		
				WPDU	16oz unpresserved plstic		

Work Order Number: 60464704

Pace® Location Requested (City/State):
Pace Analytical: Kansas
9608 Loiret Blvd., Lenexa, KS 66219

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevant fields

WO# : 60464704

60464704

Company Name:	Rocksmith Geoengineering, LLC	Contact/Report To:	Mark Haddock
Street Address:	2320 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark.haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC# 10		
Project Name:	AMEREN SCPC	Invoice To:	Mark Haddock
		Invoice E-Mail:	mark.haddock@rocksmithgeo.com
Site Collection Info/Facility ID (as applicable):		Purchase Order # (if applicable):	
		Quote #:	

Time Zone Collected: [ ] AK [ ] PT [ ] MT [ ] CT [ ] ET — County / State origin of sample(s): Missouri

Data Deliverables: [ ] Level II [ ] Level III [ ] Level IV [ ] EQUIS [ ] Other

Regulatory Program (DW, RCRA, etc.) as applicable: Reportable [ ] Yes [ ] No

Rush (Pre-approval required): [ ] Same Day [ ] 1 Day [ ] 2 Day [ ] 3 Day [ ] Other _____

DW PWSID # or WW Permit # as applicable:

Date Results Requested:

Field Filtered (if applicable): [ ] Yes [ ] No

Analysis:

* Matrix Codes (insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Bioassay (B), Vapor (V), Surface Water (SW), Sediment (SED), Sludge (SL), Caulk (CK), Leachate (LL), Biosolid (BS), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Composite Start Date	Composite Start Time	Collected or Composite End Date	Collected or Composite End Time	# Cont.	Res. Chlorine Results	Res. Chlorine Units	200.7 Metals, Total	Cl/FSO4/TDS/Alkalinity	App III and Cat/An Metals (200.7)*
S-UG-1A	WT											
S-DG-1	WT											
S-DG-2	WT											
S-DG-3	WT											
S-DG-4	WT											
S-SCPC-DUP-1	WT											
S SCPC-FB-1	WT											
S-SCPC-MS-1	WT											
S-BMW-1S	WT	G			11/20/24	0900	3			✓	✓	✓
S-BMW-3S	WT	G			"	1143	2			✓	✓	✓

Specify Container Size **: 1 1 3

Identify Container Preservative Type***: 1 1 2

Analysis Requested

** Container Size: (1) 1L, (2) 500mL, (3) 250mL, (4) 125mL, (5) 100mL, (6) 40mL vial, (7) EnCore, (8) TerraCore, (9) 90mL, (10) Other

*** Preservative Types: (1) None, (2) HNO3, (3) H2SO4, (4) HCl, (5) NaOH, (6) Zn Acetate, (7) NaHSO4, (8) Sod. Thiosulfate, (9) Ascorbic Acid, (10) MeOH, (11) Other

Lab Use Only

Proj. Mgr: Jamie Church

AcctNum / Client ID:

Table #:

Profile / Template: 15856

Prelog / Bottle Ord. ID: EZ 3163158

Sample Comment

Preservation non-conformance identified for sample

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: Ba, Ca, Fe, Mg, Mn, K, Na

Collected By: (Printed Name) John Rasmussen

Signature:

Customer Remarks / Special Conditions / Possible Hazards:

# Coolers	Thermometer ID:	Correction Factor (°C):	Obs. Temp. (°C)	Corrected Temp. (°C)	On Ice:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Rocksmith			11/21/24 0745	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Delivered by [ ] In-Person [ ] Courier [ ] FedEX [ ] UPS [ ] Other
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Page: 1 of 1

Memorandum

January 22, 2025

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23009-24
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	grant.morey@rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCPC – Data Package 60464704**		

The following is a summary of instances where quality control criteria in the functional guidelines were not met and data qualification was required:

- When a compound was detected in a blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- When a compound was detected in a sample result between the Method Detection Limit (MDL) and Practical Quantification Limit (PQL), the results were recorded at the detection value and qualified as estimates (J).
- When a matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates based high, and J- for estimates based low).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC
Project Number: 23009-24
Reviewer: G. Morey
Validation Date: 01/22/2025

Laboratory: Pace Analytical
SDG #: 60464704
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-UG-2, S-UG-1A, S-DG-1, S-DG-2, S-DG-3, S-DG-4, S-SCPC-DUP-1, S-SCPC-FB-1, S-BMW-1S, S-BMW-3S

NOTE: Please provide calculation in Comment areas or on the back (if on the back please indicate in comment areas).

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			11/14/24-11/20/24
b) Sampling team indicated?	x			JDQ, JTR & GTM
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Spec Cond, Turb, Temp, DO, ORP
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	No lab narrative.

Note Deficiencies: _____

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	x			
b) Was the COC signed by both field and laboratory personnel?	x			
c) Were samples received in good condition?	x			

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	x			
b) Were hold times met for sample analysis?		x		See Notes
c) Were the correct preservatives used?	x			
d) Was the correct method used?	x			
e) Were appropriate reporting limits achieved?	x			
f) Were any sample dilutions noted?	x			See Notes
g) Were any matrix problems noted?		x		

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☐	☒	☐	
b) Were analytes detected in the field blank(s)?	☒	☐	☐	S-SCPC-FB-1 @ S-DG-3
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	☒	☐	☐	
b) Were the proper analytes included in the LCS?	☒	☐	☐	
c) Was the LCS accuracy criteria met?	☒	☐	☐	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	☒	☐	☐	S-SCPC-DUP-1 @ S-DG-1
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	See Notes
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	☐	☐	☒	
b) Was the %D within control limits?	☐	☐	☒	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☒	☐	See Notes
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

General:

Chloride and sulfate diluted in several samples, no qualifications necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Field blank:

S-SCPC-FB-1 @ S-DG-3: calcium (35.9J) and fluoride (0.21). Fluoride result < 10x blank, result qualified as estimate.

Field duplicates:

S-SCPC-DUP-1 @ S-DG-1: All RPD's within control limits.

Lab duplicates:

Max RPD: 15% for chloride, fluoride, and sulfate; 10% for alkalinity and TDS.

MS/MSD:

362944: MS recovery high for calcium. Associated with unrelated sample, no qualification necessary.

3632818/3632819: MS recovery high for calcium, MSD recovery and RPD within control. Associated with unrelated sample, no qualification necessary.

3639788/3639789: MSD recovery high for fluoride, MS recovery and RPD within control. Associated with sample -004, no qualification necessary.

3642617/3642618: MS/MSD recovery and RPD high for fluoride. MSD recovery high for sulfate, MS recovery and RPD within controls. Associated with unrelated sample, no qualification necessary.

3642620: MS recovery low for chloride. Associated with unrelated sample, no qualification necessary.

3630189: MS recovery low for calcium. Associated with sample -007 result qualified as estimate.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-SCPC-DUP-1	Calcium	148000	J-	MS recovery low
S-DG-3	Fluoride	0.39	J	Detected in field blank, result < 10x blank

Signature: Grant Morey Date: 01/22/2025

Appendix B

Alternative Source Demonstration – November 2023 Sampling Event

REPORT

SCPC – Alternative Source Demonstration

Sioux Energy Center, St. Charles County, Missouri, USA

June 24, 2024

Project Number: 23009-24

Submitted to:

Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

Submitted by:

Rocksmith Geoengineering, LLC
2320 Creve Coeur Mill Rd
Maryland Heights, MO 63043

Table of Contents

TABLES

FIGURES

1.0 CERTIFICATION STATEMENT

This *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule) under the direction of a licensed professional engineer with Rocksmith Geoengineering, LLC.

I hereby certify that this *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

Rocksmith Geoengineering, LLC.,

_____

Mark Haddock, P.E., R.G.

Principal Engineer, Senior Partner

2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this SCPC – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPC Cell 1. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.0 SITE DESCRIPTION AND BACKGROUND

Ameren owns and operates the SEC in St. Charles County, Missouri located approximately 12 miles west-northwest of the confluence of the Mississippi and Missouri Rivers. **Figure 1** depicts the site location and layout, including the location of SCPC. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPC lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits that lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet in thickness and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Drilling in the alluvial aquifer identified different sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region includes Mississippian-aged rocks of the Meramecian Series. Formations include primarily limestone, dolomite, and shale and are comprised of the Salem Formation overlying the Warsaw Formation and the Burlington-Keokuk Formation.

3.2 Utility Waste Landfill – SCPC

UWL Cell 1 is referred to by Ameren as the SCPC, or "Gypsum Pond" Cell 1. The SCPC is approximately 37.5 acres in size and is located south of the generating plant on the south side of Highway 94 (Figure 1). The CCR Unit managed CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD), which began operation in 2010. The unit ceased receiving CCR waste on December 14, 2022 and closure has begun on the unit. Closure is anticipated to be completed by the end of 2024. Since that date, the WFGD has been sent to the adjacent SCPD CCR Unit.

The WFGD process occurs after the removal of slag and fly ash. A crushed limestone (CaCO3) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate (CaSO4 * 2H2O)). The resultant gypsum material was wet sluiced from the plant across the highway to the SCPC. Once there, the gypsum dewatered by gravity with the sluice conveying recycled water back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPC was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil high density polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2014 Proposed Construction Permit Modification, Construction Permit Number 0918301 (Gredell and Reitz & Jens, 2014).

A groundwater monitoring well network was installed in 2007 and 2008 to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 16 monitoring wells ringing the current and proposed future extents of the UWL (Figure 1). These monitoring wells are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the Missouri UWL parameters.

The permit for the SCPC was issued July 30, 2010 (permit #0918301). Nine sampling events were performed prior to July 30, 2010 and represent groundwater quality prior to WFGD placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following were completed prior to the October 17, 2017 deadline: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPC consists of eight monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on Figure 1. Six existing monitoring wells (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4) were installed by Gredell Engineering Resources, Inc. in December 2007 and June 2008 as a part of the Missouri UWL state monitoring program. The remaining monitoring wells (BMW-1S and BMW-3S) were installed by Golder in 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCPC GMP (Golder, 2017) and the SCPC 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight baseline sampling events were completed for the SCPC. After baseline sampling, the first Detection Monitoring event was completed in November of 2017. The following Appendix III constituents were analyzed during Detection Monitoring:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

In January 2018, background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the Detection Monitoring results from the November 2017 samples and subsequent semi-annual Detection Monitoring sampling events. If results were higher than the calculated UPL, this was considered to be an initial exceedance, and a verification sample was then collected and tested in accordance with the SCPC Statistical Analysis Plan (SAP). In August 2019, the background dataset used to calculate statistical limits was expanded to include the first four Detection Monitoring events, per the SAP. The updated UPLs were then used for the November 2019 and subsequent Detection Monitoring events. The following provides a summary of the Detection Monitoring results to date.

Since November 2017, several ASDs have been prepared for DG-2, DG-3, DG-4, UG-1A, and UG-2. These previous ASDs are available in the Annual Reports for the SCPC and are available on Ameren's publicly available CCR Compliance website (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports). These ASDs have demonstrated that previous SSIs at the site were not caused by the SCPC, but rather the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer or caused by the SCPC being downgradient from the SCPA, which is currently in Corrective Action.

In November 2023, one initial exceedance was identified: boron at UG-2. Verification sampling results confirmed this initial exceedance. Additionally, during updates to the prediction limits completed in March 2024 (Rocksmith, 2024), the UPL for Total Dissolved Solids at DG-4 was lowered below the November 2023 sample result. Because this update occurred after the February 2024 verification sampling event, no verification sample was collected. Therefore, TDS at DG-4 from November 2023 is treated as an SSI for this ASD. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring wells UG-2 and DG-4 are screened in the upper portion of the alluvial aquifer, just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, DG-4 is located south of the SCPC while UG-2 is located north of the SCPC. Both wells are south of the generating plant, Highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Rocksmith's review of the pre-disposal data (discussed in Section 3.2 above), as well as our comparison of the pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater in some areas around the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC construction and operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program. Intrawell prediction limits for the SCPC monitoring network were updated in March 2024. A summary table of the November 2023 SSIs is provided in **Table 2.**

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	Current UPL (Updated March 2024)	Baseline Sampling Event Range	Range of Values Prior to November 2023 Sampling Event (CCR Rule and State UWL Sampling)	November 2023 Result	February 2024 Result
Boron (µg/L)	UG-2	234.6	277.7	88.2 – 196	ND (<100) – 2,180	1,700	1,360
Total Dissolved Solids (mg/L)	DG-4	698.9	680.5	543 – 637	474 – 808	732	NS

Notes:
1) mg/L – milligrams per liter.
2) µg/L – micrograms per liter.
3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
4) ND – Non-Detect
5) NS – Not sampled. The upper prediction limit for TDS at DG-3 was updated in March 2024 to be below the November 2023 sampling event. Because this update occurred following the February 2024 verification sampling event, no verification sample was collected.

TDS is the sum of all dissolved solids within water and refers to any minerals, salts, metals, cations or anions dissolved in water. TDS is principally made up of calcium, magnesium, potassium, sodium, bicarbonates (alkalinity), chlorides, sulfates and some small amounts of organic matter.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs are not the result of a release from the SCPC and the SSI originates from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Southward groundwater flow from the upgradient SCPA CCR Unit, currently in Corrective Action, toward the SCPC.
- Documentation of pre-existing, low-level concentrations of CCR indicators and other parameters in groundwater that pre-date the SCPC operation, especially on the northern side of the SCPC.
- Lack of elevated FGD Indicators (sulfate, calcium, chloride) above pre-CCR placement levels in monitoring wells with SSIs.
- Construction documents of the SCPC indicating the 60-mil high-density polyethelyne (HDPE) geomembrane liner and a 2-foot thick clay barrier met quality assurance testing during construction.

5.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 3** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 3: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	• Boron • Molybdenum • Lithium • Sulfate • Bromide • Potassium • Sodium • Fluoride
Boiler Slag / Bottom Ash	Molten bottom ash from the slag tap and cyclone type furnaces that turns into pellets that have a smooth glassy appearance after quenching with water.	
Flue Gas Desulfurization Material (FGD)	A material leftover from the process of reducing sulfur dioxide emissions from a coal-fired boiler that can be a wet sludge consisting of calcium sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	• Sulfate • Fluoride • Calcium • Boron • Bromide • Chloride

Notes:

1) Fly ash and boiler slag/bottom ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.
3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

As described above, the SCPC historically received FGD-type wastes managed at the SEC.

5.2 Evaluation of the Statistically Significant Boron Exceedance at UG-2

In 2018, an ASD was completed for the SCPB (fly ash pond) unit to the north/northeast of the SCPC and is available in the 2018 Annual Report for the SCPB on Ameren's publicly available website[1]. In that ASD, pore-water samples were collected from the SCPA and SCPB, and samples were collected in the shallow, intermediate

[1] Ameren's publicly available CCR reporting website is available at: (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports)

(middle) and deep zones of the alluvial aquifer just outside of the two units. From this ASD, it was determined that CCR impacts found directly outside of the SCPB are from the SCPA and not the SCPB. Impacts were present at their highest concentrations at deeper depths, and groundwater chemistry was similar between the waters of the SCPA and the impacted wells. The SCPB ASD concluded these deeper impacts are from the SCPA because the SCPA is an unlined CCR unit that extends approximately 70 feet below ground surface, while the SCPB is an HDPE-lined, shallower CCR unit. Therefore, if impacts were from the SCPB, they would be expected to be concentrated in the shallow zone of the alluvial aquifer, whereas impacts from the SCPA would be present across all zones of the alluvial aquifer. Additionally, the SPCA has historically managed bottom ash, fly ash, and boiler slag. As displayed in **Table 2**, boron is a key indicator parameter for impacts from these types of CCR.

Figure 2 displays boron concentrations at UG-2 since state monitoring began in 2008. As displayed on Figure 2, there has been a previous spike in boron concentration in 2013 – 2014. This spike has been attributed to construction associated with the nearby SCL4A.

In 2018 and 2019, the SCPA moved from Assessment Monitoring into Corrective Action and an investigation into the nature and extent of impacts from the SCPA was completed. As a part of this investigation, samples were collected in the shallow, middle, and deep zones of the alluvial aquifer in multiple locations around the site. One set of piezometers (TP-5) was installed approximately 200 feet to the east of UG-2. In the TP-5 piezometers, boron concentrations ranged from 211-263 µg/L in the shallow zone of the alluvial aquifer, 3,120-3,190 µg/L in the intermediate zone and 5,460-8,250 µg/L in the deep zone of the alluvial aquifer.

This increase in boron concentration with depth at TP-5 is indicative of impacts from the SCPA rather than the SCPB, SCPC or SCL4A because the SCPA is unlined and extends downward 70 feet below ground surface, whereas the SCPB, SCPC and SCL4A are constructed with liner systems with base elevations above the natural groundwater table. If impacts were from the SCPC, the greatest impacts would be expected in the shallow zone of the alluvial aquifer and would dilute and be expected to decrease with depth. Results from the nature and extent and corrective action investigations further indicate that impacts in the alluvial aquifer at the SEC are from the SCPA and not the other lined units.

For boron impacts to be from the SCPA, UG-2 would need to be hydraulically connected to the SCPA. As displayed on **Figure 1**, UG-2 is located approximately 1,500 feet to the south/southeast of the SCPA at its nearest point. As discussed in the Annual Reports for the SCPC, publicly available on Ameren's website, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, which affect water levels, gradients and flow directions in the aquifer. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce "bank recharge" and "bank discharge" conditions. At this facility, groundwater can flow north or south toward the Mississippi and Missouri Rivers, depending on river levels.

River level elevations for the site can be estimated using nearby United State Geological Survey (USGS) gauges. Four nearby gauges are used to calculate the approximate river level of the Mississippi and Missouri Rivers at the SEC:

- Grafton Illinois gauge on the Mississippi (USGS #05587450).
- Alton Illinois gauge on the Mississippi River (USGS # 05587500)
- St. Louis Missouri gauge on the Mississippi River (USGS #07010000)
- St. Charles Missouri gauge on the Missouri River (USGS #06935965)

A daily water gauge measurement is available for each of these four gauges since at least November 15, 1986. **Figure 3** summarizes the calculated Missouri and Mississippi River data at the plant. The Mississippi River level at the SEC is controlled by a series of locks and dams, with the nearest one being approximately 6 miles downriver at the Mel Price Alton Lock and Dam. This dam controls the river elevation on the Mississippi River near the SEC, minimizing impacts from flooding and drought and giving the Mississippi River a more consistent elevation, as displayed on **Figure 3**. The Missouri River does not have any dams located near the SEC, with the closest dam on the Missouri River being the Gavins Point Dam, located near Yankton, South Dakota. Therefore,

the Missouri River is susceptible to larger variations in elevation caused by flooding and drought, as displayed in **Figure 3**.

Figure 4 displays the difference between the Mississippi and Missouri River for each day. **Table 4** provides a summary comparison of the Mississippi and Missouri River elevations at the plant. Using the data from January 1, 1987 to June 17, 2024, the Mississippi River was higher than the Missouri River on 7,634 of the 13,683 days (approximately 56% of the time). From 2021 through early 2024, there was a significant hydraulic gradient from the Mississippi to the Missouri River (southward), with 2023 being the second highest average gradient of southward groundwater flow since 1987 (2006 was the highest). This indicates that UG-2, which is south of the SCPA, is downgradient of the unit and hydraulically connected.

This southward flow of groundwater has been confirmed by onsite water level measurements. Prior to each sampling event, water levels are recorded at all monitoring wells to determine groundwater flow rates and direction. Potentiometric surface maps generated from these water level measurements display a southward flow of groundwater from the SCPA toward UG-2.

Table 4 – Summary of Mississippi and Missouri River Elevations

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
1987	243	122	-1.38
1988	82	284	1.48
1989	41	324	2.24
1990	162	203	0.32
1991	92	273	1.34
1992	152	214	-0.20
1993	355	10	-3.05
1994	166	199	-1.17
1995	269	96	-1.62
1996	242	124	-0.98
1997	312	53	-1.70
1998	317	48	-2.21
1999	207	158	-1.15
2000	28	338	2.30
2001	133	232	0.66
2002	63	302	2.18
2003	28	337	3.12
2004	125	241	1.08
2005	88	277	1.91
2006	11	354	4.05
2007	141	224	0.71
2008	209	157	-0.29
2009	202	163	-0.32
2010	296	69	-1.79
2011	229	136	-1.58
2012	59	307	2.15
2013	51	314	2.46
2014	88	277	1.54
2015	177	188	-0.36

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
2016	196	170	-0.55
2017	154	211	0.46
2018	232	133	0.03
2019	349	16	-3.08
2020	234	132	-0.72
2021	160	205	0.31
2022	77	288	2.39
2023	20	345	3.38
2024	59	110	0.78
Total	**6049**	**7634**	**Average Difference – 0.32 feet**

5.3 Evaluation of the Statistically Significant Increases of Total Dissolved Solids at DG-4

TDS alone is not a key indicator of CCR or FGD (EPRI 2017, EPRI 2012). As displayed on **Figure 5**, TDS concentration at DG-4 on November 13, 2023 was 732 mg/L. This concentration is just greater than the original calculated UPL used for TDS concentrations at DG-4 of 698.9 mg/L and the current UPL of 680.5 mg/L. Notably, this value is also less than the UPL of 808 mg/L that was updated following the April 2021 sampling event. As part of the state UWL sampling program, DG-4 was also sampled on November 7, 2024, immediately prior to the CCR Rule sampling event, with a TDS result of 604 mg/L. This result is well below the current and previous UPLs for TDS at DG-4 and is reflective of the historical variability observed at this well.

Historically, TDS at DG-4 has displayed significant variability, ranging from 474 – 808 mg/L since 2008. As displayed in **Figure 5,** There appears to be no significant increasing or decreasing trends over time, including with respect to the SCPC receiving CCR materials in 2010 and halting receipt of CCR materials in 2022.

As discussed previously, TDS is primarily composed of calcium, magnesium, sodium, potassium, chloride, sulfate, and alkalinity concentrations. **Table 5** displays the concentrations of each of these constituents at DG-4 collected during semi-annual detection monitoring sampling events since November 2018.

Table 5 – Total Dissolved Solids Major Constituent Concentrations over Time at DG-4

Sample Date	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Calcium (mg/L)	Total Magnesium (mg/L)	Total Chloride (mg/L)	Total Alkalinity (mg/L)	Total Sulfate (mg/L)
11/13/2018	33.8	7.54	121	37.8	80.2	412	39.3
8/19/2019	44.6	7.57	136	39.5	103	403	31.5
11/15/2019	40.3	7.58	138	38.9	96.9	381	33.9
4/28/2020	23.4	5.90	115	32.7	27.1	391	21.7
11/16/2020	35.4	8.10	132	42.0	68.5	457	37.1
4/14/2021	20.8	7.06	154	46.6	95.3	426	51.1
11/10/2021	26.9	7.90	136	40.7	58.3	442	49.9
4/1/2022	6.99	7.95	144	40.6	15.6	487	65.1
10/21/2022	35.0	7.26	136	39.3	54.0	456	52.0

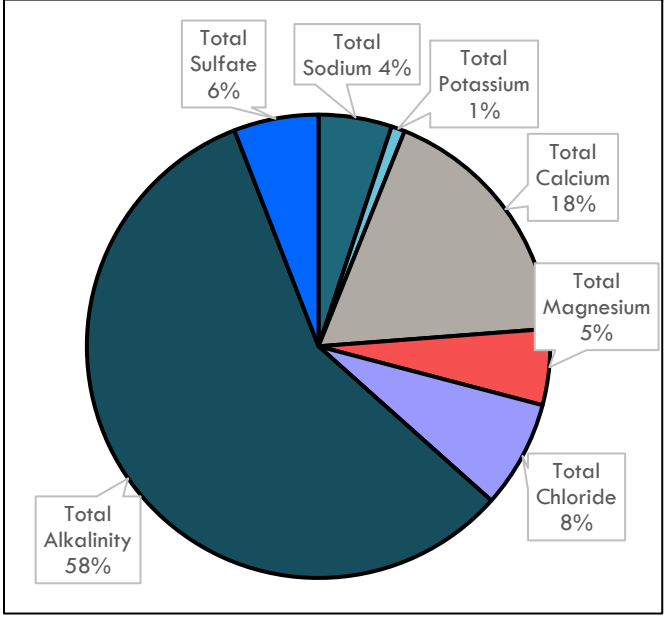
Sample Date	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Calcium (mg/L)	Total Magnesium (mg/L)	Total Chloride (mg/L)	Total Alkalinity (mg/L)	Total Sulfate (mg/L)
5/3/2023	15.1	6.64	139	43.5	25.4	501	56.9
11/13/2023	88.7	6.69	154	47.8	12.4	521	63.3
Average Concentration	**33.7**	**7.29**	**137**	**40.9**	**57.9**	**443**	**45.6**
November 2023 Ranking	**1st**	**9th**	**1st**	**1st**	**11th**	**1st**	**2nd**

Notes:

1) Alkalinity is equal to Carbonate + Bicarbonate.
2) mg/L – Milligrams per liter.
3) J – value is estimated.

As displayed in **Figure 6** and based on average concentrations in **Table 5**, alkalinity makes up approximately 58% of the total TDS value at DG-4. In November 2023, the alkalinity result was the greatest of the 11 results since November 2018, with a concentration 78 mg/L greater than the historical average and 20 mg/L greater than the next highest concentration. Alkalinity is not considered a key indicator of CCR impacts, including WFGD materials. The high alkalinity concentration observed in November 2023 relative to previous samples is the primary contributor to the elevated TDS concentration and its exceedance over the current UPL. Although concentrations for some WFGD indicators (calcium and sulfate) are higher than average at DG-4 for the November 2023 sampling event, the chloride concentration (another key WFGD indicator) is lowest relative to previous sampling events. Additionally, all indicator constituents are present below the well UPLs, indicating that there are no impacts from the SCPC.

Figure 6 – Average Percentage of Overall Total Dissolved Solids by Constituent at DG-4



6.0 DEMONSTRATION THAT STATISTICALLY SIGNIFICANT INCREASES WERE NOT CAUSED BY SCPC IMPACTS

Based on the information presented in Section 5.0 above, the SSIs reported for UG-2 and DG-4 during the November 2023 detection monitoring event are not a result of impacts from the SCPC. The SSI for boron at UG-2 is not caused by the SCPC as there are boron impacts in the shallow, intermediate and deep portions of the alluvial aquifer in this area and net groundwater flow has been toward the south. The SSI for boron at UG-2 appears to be the result of southward migrating impacts from the upgradient SCPA, which is currently in Corrective Action. The SSI for TDS at DG-4 was also not caused by impacts from the SCPC and is attributable to natural geochemical variability within the shallow alluvial aquifer. Along with these lines of evidence listed above, the SCPC is documented to be constructed with an engineered compacted clay liner overlain by a 60-mil HDPE

geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts.

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Tables

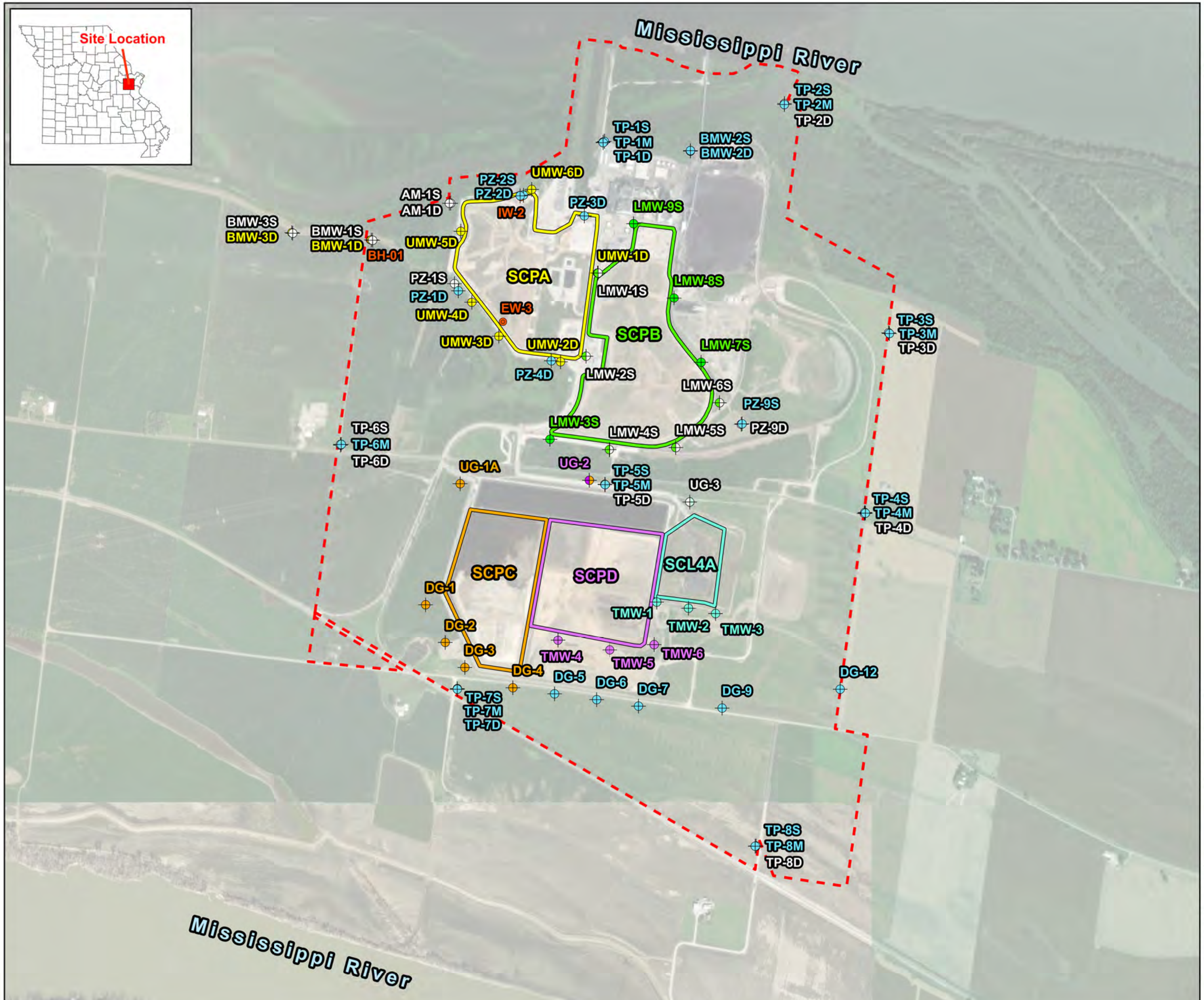
Table 1
November 2023 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
November 2023 Detection Monitoring Event															
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.433 - 7.279	6.90	6.29 - 7.5	7.10	6.565 - 7.38	7.00	6.725 - 7.268	7.02	6.66 - 7.227	6.93	6.638 - 7.221	6.88
BORON, TOTAL	µg/L	57.9 J	58.9 J	453.4	165	277.7	1,700	118.3	107	113.2	82.0 J	103.2	81.9 J	114.1	105
CALCIUM, TOTAL	µg/L	136,000	114,000	203,439	157,000	143,772	119,000	174,000	138,000	166,000	133,000 J	169,490	160,000	166,717	154,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	147.8	74.8 J	93.74	12.9 J	10	2.5 J	10.93	2.3 J	17.26	8.2 J	155.7	12.4 J
FLUORIDE, TOTAL	mg/L	ND	ND	0.47	ND	0.34	ND	0.41	ND	0.49	ND	0.49	ND	0.48	ND
SULFATE, TOTAL	mg/L	46.9	12.3	113.4	52.7 J	93.63	0.79 J	69.58	19.4 J	68	35.2 J	74.45	65.1 J	79.91	63.3 J
TOTAL DISSOLVED SOLIDS	mg/L	475	398	819.5	672	657.3	483	552.3	549	537	505	617.9	594	680.5	732*
February 2024 Verification Sampling Event															
DATE	NA						2/7/2024								
pH	SU														
BORON, TOTAL	µg/L						1,360								
CALCIUM, TOTAL	µg/L														
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L														
TOTAL DISSOLVED SOLIDS	mg/L														

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. * - During updates to prediction limits completed in March 2024, the upper prediction limit for Total Dissolved Solids at DG-4 was lowered below the November 2023 sample result. Because this update occured after the February 2024 verification sampling event, no verification sample was collected. This result will be treated as an SSI and an Alternative Source Demonstration will be produced for Total Dissolved Solids at well DG-4.

Prepared By: GTM
Checked By: ANT
Reviewed By: MNH

Figures



TITLE

SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

Legend

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)

Utility Waste Landfill Cells

- SCL4A - Dry CCR Disposal Area
- SCPC- Inactive FGD Surface Impoundment
- SCPD - FGD Surface Impoundment

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB and Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPC Detection Monitoring Well
- SCPD and SCPC Detection Monitoring Well
- SCPD Detection Monitoring Well
- SCL4A and Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements Only
- Soil Boring Location for Sequential Extraction Samples

NOTES

1. All boundaries and locations are approximate.
2. FGD - Flue Gas Desulfurization.
3. CCR - Coal Combustion Residuals.

REFERENCES

1. Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.

0 500 1,000 2,000 3,000 Feet

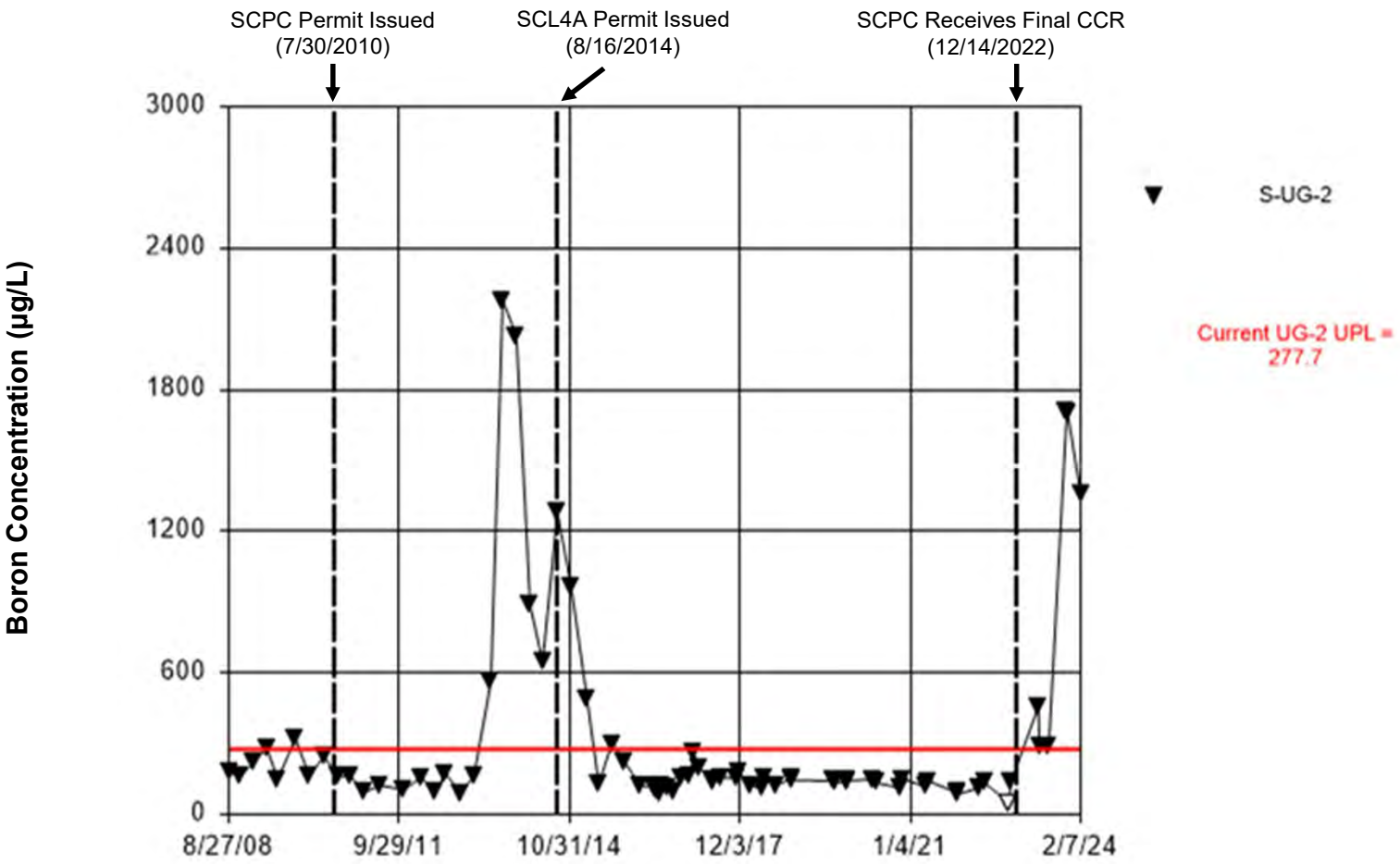
PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

Ameren

ROCKSMITH GEOENGINEERING

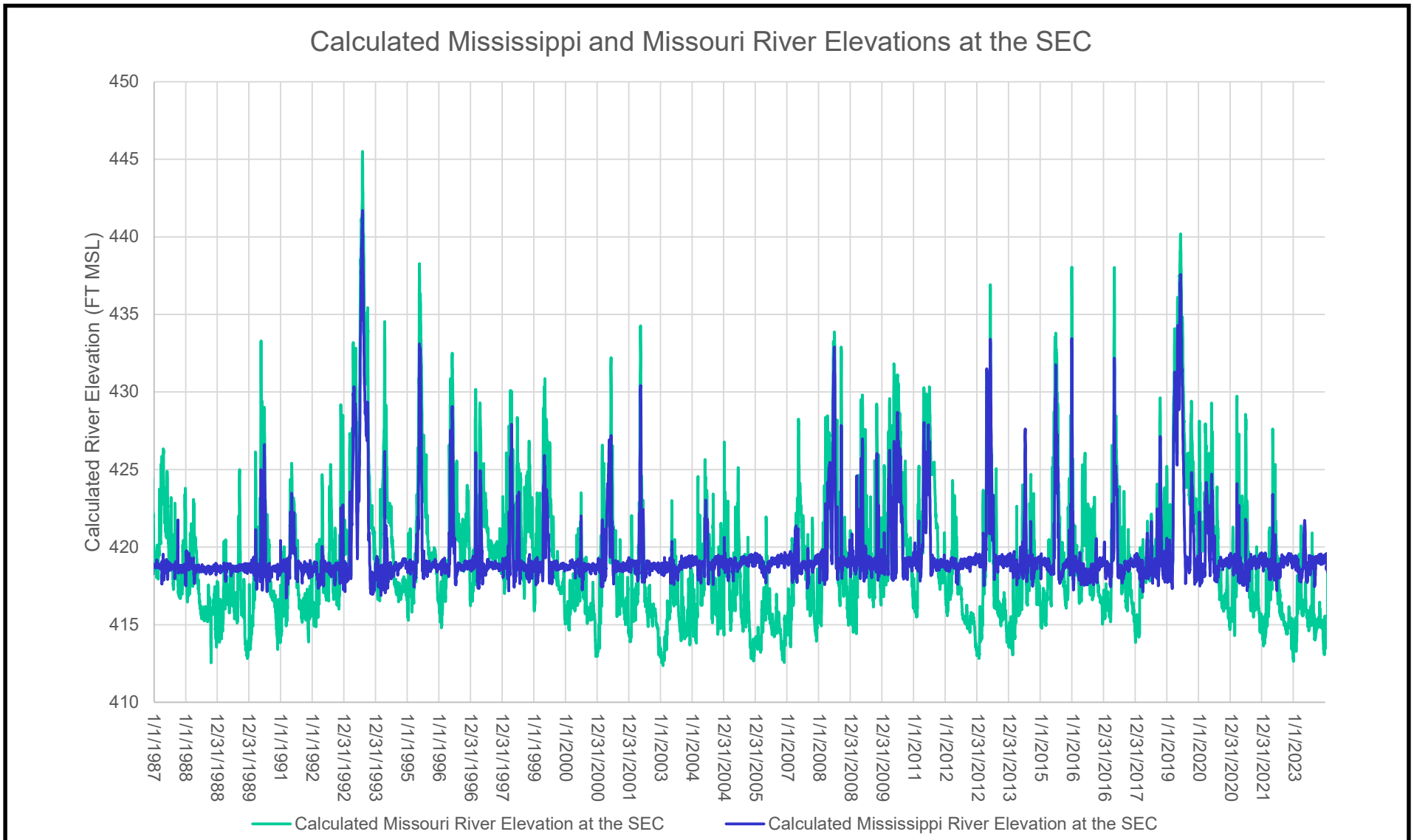
DESIGN	JSI	YYYY-MM-DD	2023-03-29
PREPARED	JSI	PROJECT No.	23009
REVIEW	GTM		
APPROVED	MNH		**FIGURE 1**



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Timeseries Plot of Boron Concentrations at UG-2**
DRAWN GTM	CHECKED JTA	REVIEWED MNH	DATE 2024-06-18	Rev No. NA / JOB NO. 23009-24 / FIGURE **2**

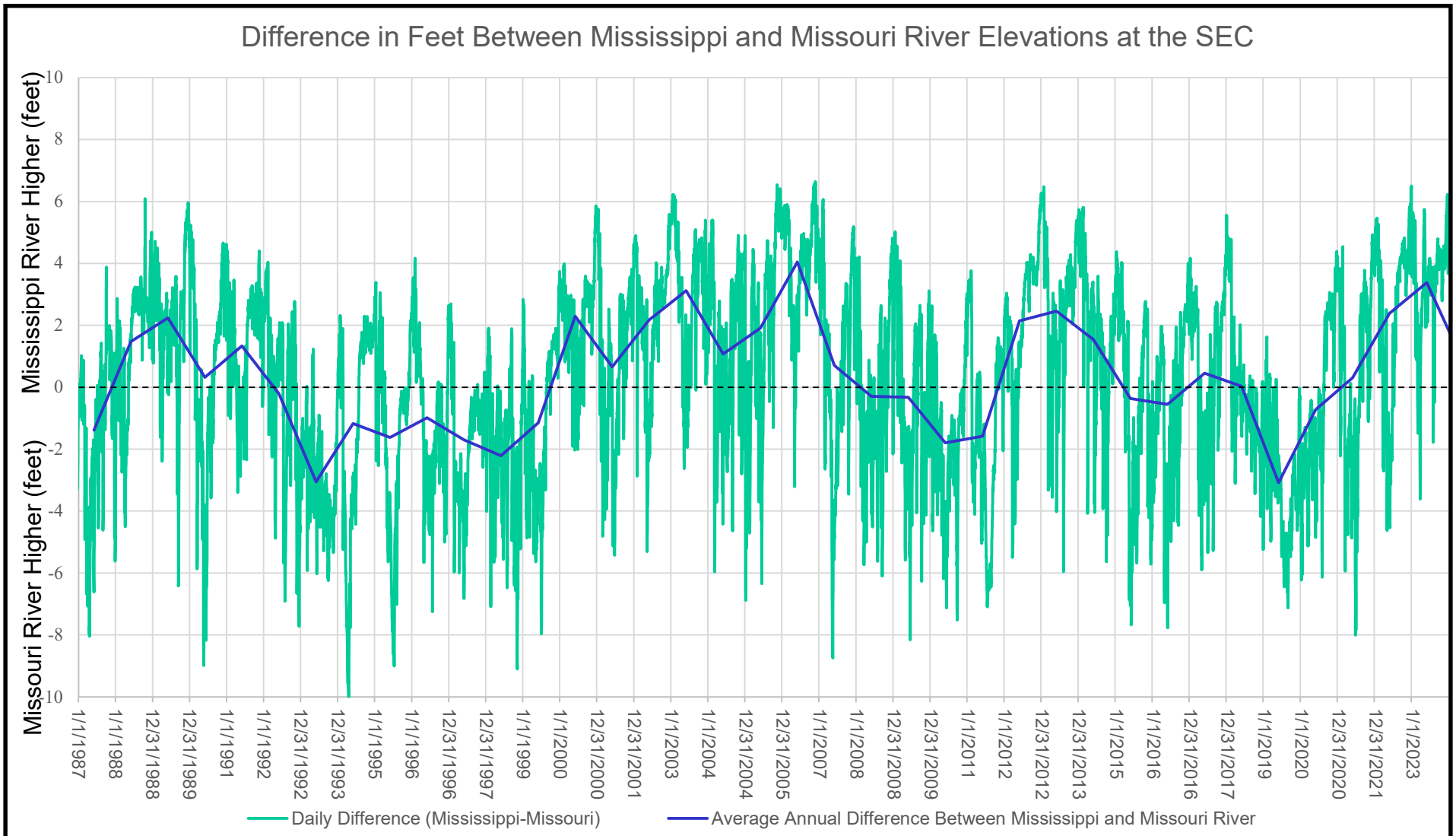
ROCKSMITH GEOENGINEERING



Notes
1) River levels calculated based on USGS river gauge values near the SEC.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Calculated Mississippi and Missouri River Elevations at the SEC		
DRAWN GTM	CHECKED JTA	REVIEWED MNH	DATE 2024-06-18	Rev No. NA	JOB NO. 23009-24	FIGURE 3

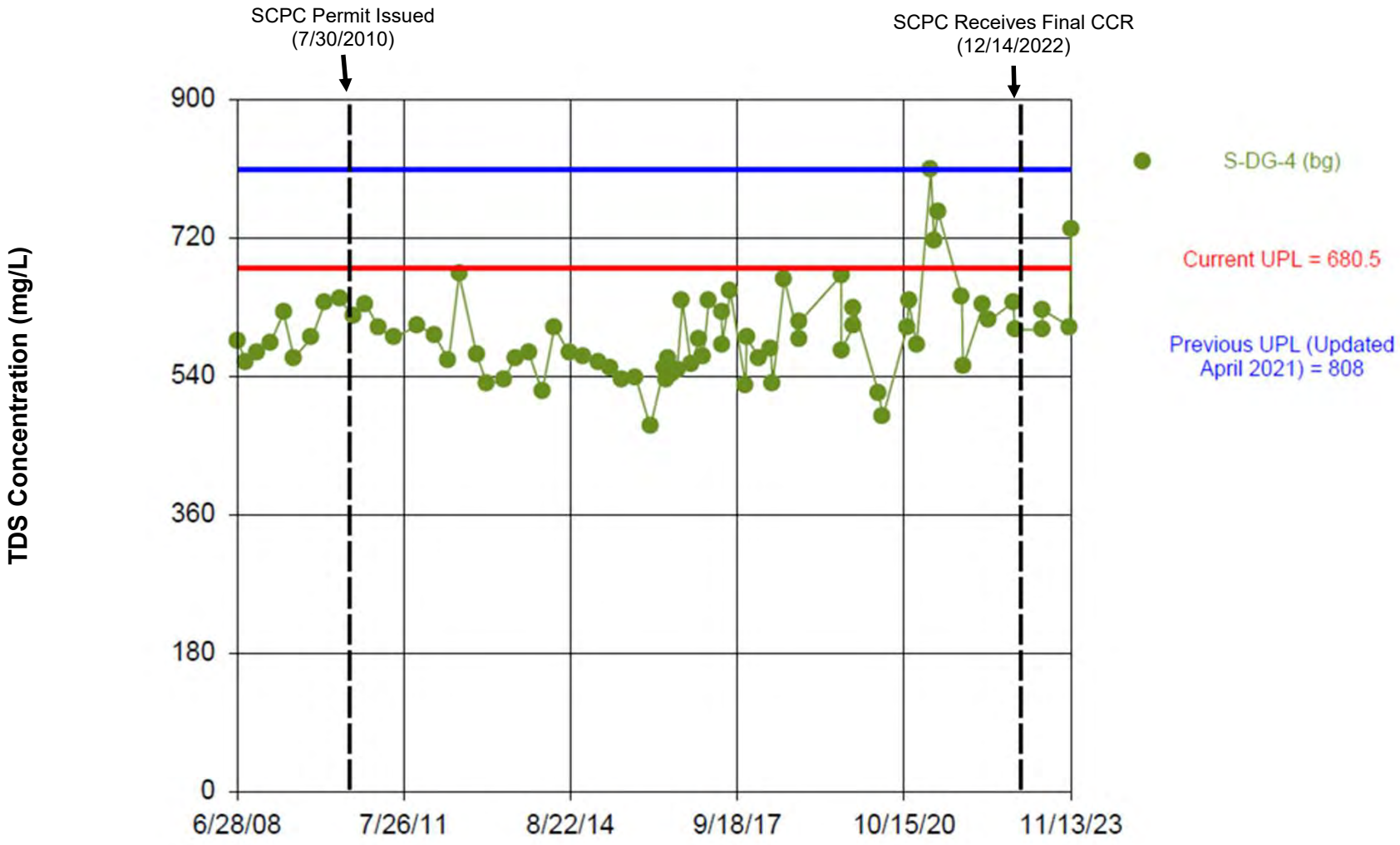
ROCKSMITH GEOENGINEERING



Notes

1) Results in feet, values displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation.

CLIENT/PROJECT					TITLE
AMEREN MISSOURI SIOUX ENERGY CENTER				ROCKSMITH GEOENGINEERING	**Difference in Feet Between Mississippi and Missouri River Elevations at the SEC**
DRAWN	CHECKED	REVIEWED	DATE		Rev No. / JOB NO. / FIGURE
GTM	JTA	MNH	2024-06-18		NA / 23009 / **4**



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.
4) TDS – Total Dissolved Solids.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				**Timeseries Plot of Total Dissolved Solids Concentrations at DG-4**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
GTM	JTA	MNH	2024-06-20	NA	23009-24	**5**

ROCKSMITH GEOENGINEERING

Appendix C

Alternative Source Demonstration – May 2024 Sampling Event

REPORT

SCPC – Alternative Source Demonstration

Sioux Energy Center, St. Charles County, Missouri, USA

January 3, 2025

Project Number: 23009-24

Submitted to:

Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

Submitted by:

Rocksmith Geoengineering, LLC
2320 Creve Coeur Mill Rd
Maryland Heights, MO 63043

Table of Contents

TABLES

FIGURES

1.0 CERTIFICATION STATEMENT

This *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (USEPA) coal combustion residual (CCR) rule) under the direction of a licensed professional engineer with Rocksmith Geoengineering, LLC.

I hereby certify that this *SCPC – Alternative Source Demonstration, Sioux Energy Center, St. Charles County, Missouri, USA* located at 8501 Missouri 94, West Alton, Missouri 63386 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

Rocksmith Geoengineering, LLC.,

_____

Mark Haddock, P.E., R.G.

Principal Engineer, Senior Partner

2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (USEPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this SCPC – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPC (Cell 1). This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.0 SITE DESCRIPTION AND BACKGROUND

Ameren owns and operates the SEC in St. Charles County, Missouri located approximately 12 miles west-northwest of the confluence of the Mississippi and Missouri Rivers. **Figure 1** depicts the site location and layout, including the location of SCPC. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPC lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits that lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet in thickness and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Drilling in the alluvial aquifer identified different sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region includes Mississippian-aged rocks of the Meramecian Series. Formations include primarily limestone, dolomite, and shale and are comprised of the Salem Formation overlying the Warsaw Formation and the Burlington-Keokuk Formation.

3.2 Utility Waste Landfill – SCPC

UWL Cell 1 is referred to by Ameren as the SCPC, or "Gypsum Pond" Cell 1. The SCPC is approximately 37.5 acres in size and is located south of the generating plant on the south side of Highway 94 (Figure 1). The CCR Unit managed CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD), which began operation in 2010. The unit ceased receiving CCR waste on December 14, 2022, and closure has begun on the unit. Since that date, the WFGD has been sent to the adjacent SCPD CCR Unit.

The WFGD process occurs after the removal of slag and fly ash. A crushed limestone ($CaCO_3$) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($CaSO_4 * 2H_2O$)). The resultant gypsum material was wet sluiced from the plant across the highway to the SCPC. Once there, the gypsum material is dewatered by gravity with the sluice conveying recycled water back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPC was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil high density polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2014 Proposed Construction Permit Modification, Construction Permit Number 0918301 (Gredell and Reitz & Jens, 2014).

A groundwater monitoring well network was installed in 2007 and 2008 to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 16 monitoring wells ringing the current and proposed future extents of the UWL (Figure 1). These monitoring wells

are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the Missouri UWL parameters.

The permit for the SCPC was issued July 30, 2010 (permit #0918301). Nine sampling events were performed prior to July 30, 2010 and represent groundwater quality prior to WFGD placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the sections presented below.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following were completed prior to the October 17, 2017 deadline: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPC consists of eight monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Six existing monitoring wells (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4) were installed by Gredell Engineering Resources, Inc. in December 2007 and June 2008 as a part of the Missouri UWL state monitoring program. The remaining monitoring wells (BMW-1S and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCPC GMP (Golder, 2017) and the SCPC 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight baseline sampling events were completed for the SCPC. After baseline sampling, the first Detection Monitoring event was completed in November of 2017. The following Appendix III constituents were analyzed during Detection Monitoring:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

In January 2018, background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the Detection Monitoring results from the November 2017 samples and subsequent semi-annual Detection Monitoring sampling events. If results were higher than the calculated UPL, this was considered to be an initial exceedance, and a verification sample was then collected and tested in accordance with the SCPC Statistical Analysis Plan (SAP). In August 2019, the background dataset used to calculate statistical limits was expanded to include the first four Detection Monitoring events, per the SAP. The updated UPLs were then used for the November 2019 and subsequent Detection Monitoring events. UPLs for the SCPC Detection Monitoring network were updated again using data collected through June 2021, and most recently, using data collected through July 2023 (Rocksmith 2024). The following provides a summary of the Detection Monitoring results to date.

Since November 2017, several ASDs have been prepared for DG-2, DG-3, DG-4, UG-1A, and UG-2. These previous ASDs are available in the Annual Reports for the SCPC and are available on Ameren's publicly available CCR Compliance website (https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports). These ASDs have demonstrated that previous SSIs at the site were not caused by the SCPC, but rather the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer or caused by the SCPC being downgradient from the SCPA, which is currently in Corrective Action.

The May 2024 Detection Monitoring event at the SCPC identified the following initial exceedances: chloride at DG-1, sulfate and total dissolved solids at DG-2, and chloride and sulfate at DG-3. Verification sampling

completed in July 2024 confirmed SSIs of chloride and sulfate at DG-3, but the other initial exceedances were not confirmed. Results from the May 2024 Detection Monitoring event and associated verification sampling are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring well DG-3 is screened in the upper portion of the alluvial aquifer, just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, DG-3 is located along the southwestern perimeter of the SCPC. DG-3 is located south of the generating plant, Highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Rocksmith's review of the pre-disposal data (discussed in Section 3.2 above), as well as our comparison of the pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater in some areas around the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC construction and operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program. Intrawell prediction limits for the SCPC monitoring network were updated in March 2024 using data collected through July 2023. A summary table of the May 2024 SSIs is provided in **Table 2.**

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	Current UPL (Updated March 2024)	Baseline Sampling Event Range	Range of Values Prior to May 2024 Sampling Event (CCR Rule and State UWL Sampling)	May 2024 Result	July 2024 Result
Chloride (mg/L)	DG-3	16.08	17.26	2.7 – 23.0	5.7 – 12.3	26.6	34.0 J
Sulfate (mg/L)	DG-3	61.41	74.45	49.1 – 59.4	29.7 – 82.0	75.8	83.3

Notes:
1) mg/L – milligrams per liter.
2) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
3) J – Result is an estimated value.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs are not the result of a release from the SCPC and the SSI originates from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Lack of elevated key FGD Indicators (boron, fluoride, calcium, sulfate) above pre-CCR placement levels at monitoring well DG-3.
- Documentation of pre-existing, low-level concentrations of CCR indicators and other parameters in groundwater that pre-date the SCPC operation, particularly in monitoring wells just south of DG-3 along Dwiggins Road.
- Variable groundwater flow across the site, which temporarily flows northward from Dwiggins Road to well DG-3.

- Construction documents of the SCPC indicating the 60-mil high-density polyethelyne (HDPE) geomembrane liner and a 2-foot thick clay barrier met quality assurance testing during construction.

5.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 3** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 3: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	• Boron • Molybdenum • Lithium • Sulfate • Bromide • Potassium • Sodium • Fluoride
Boiler Slag / Bottom Ash	Molten bottom ash from the slag tap and cyclone type furnaces that turns into pellets that have a smooth glassy appearance after quenching with water.	
Flue Gas Desulfurization Material (FGD)	A material leftover from the process of reducing sulfur dioxide emissions from a coal-fired boiler that can be a wet sludge consisting of calcium sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	• Sulfate • Fluoride • Calcium • Boron • Bromide • Chloride

Notes:
1) Fly ash and boiler slag/bottom ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.
3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

5.2 Site Specific Key CCR Indicators

To be a key CCR Indicator parameter for a specific site, a constituent should be present in relatively high concentrations in the leachate (CCR pore-water) when compared to background or other sources (nearby rivers, etc.), not be a common anthropogenic contaminant, and be mostly non-reactive and mobile in the site hydrogeological environment (EPRI 2012). In 2012, EPRI investigated which constituents are the best indicator parameters for coal ash impacts as outlined in **Table 1**. Of the key indicators listed in **Table 1** for flue gas desulfurization material, sulfate, fluoride, calcium, boron, and chloride are regularly sampled as part of the CCR Rule. Testing for bromide has not been completed at this site.

Table 2 provides a snapshot of the concentrations present onsite in background groundwater, Mississippi River, Missouri River, SCPA pore-water, and SCPD leachate for the constituents sampled on the key indicator list for FGD material.

Table 2 – Summary of FGD Impact Indicator Parameters at the Sioux Energy Center

Constituent (Units)		Back-ground	Mississippi River[1]	Missouri River[1]	SCPA Porewater	SCPD Leachate	Advantages and Caveats as Key Indicator (from EPRI 2012)
Sulfate (mg/L)	Minimum	12.3	29.9	188	48.5	5,820	High concentrations expected in both washed and unwashed FGD gypsum. Commonly analyzed. Very mobile in all hydrogeologic environments. Less useful in strongly reducing environments where sulfate can be reduced to hydrogen-sulfide gas.
	Average	31.03	34.08	192.1	1,088		
	Maximum	61.1	40.5	196	2,080		
Fluoride (mg/L)	Minimum	ND (<0.086)	0.16	0.43	0.22	68.0	Mobile and non-reactive in common hydrogeologic environments. Assure that leachate concentration is higher than background, particularly for washed gypsum.
	Average	0.2735	0.196	0.4435	1.142		
	Maximum	0.46	0.24	0.46	2.9		
Calcium (µg/L)	Minimum	97,100	42,500	63,000	73,400	911,000	High concentrations expected in both washed and unwashed FGD gypsum. Understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations.
	Average	129,001	50,255	64,385	409,680		
	Maximum	184,000	58,500	65,400	825,000		
Boron (µg/L)	Minimum	42.4	27.1	110	348	239,000	Mobile indicator constituent for unwashed FGD gypsum. Concentrations for washed gypsum may be too low to be useful.
	Average	94.05	36.4	112.3	53,266		
	Maximum	240	59.9	117	111,000		
Chloride (mg/L)	Minimum	1.9	22.2	23.3	20.5	7,390	Mobile indictor constituent for unwashed FGD gypsum. Concentrations may be very high if transport water is recirculated. Concentrations for washed gypsum may be too low to be useful.
	Average	8.625	27.06	23.48	24.34		
	Maximum	16.8	41.0	23.9	27.1		

Notes:

1) Unit abbreviations - mg/L – milligrams per liter, µg/L – micrograms per liter
2) ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
3) SCPA porewater samples collected by Golder Associates in January 2018.
4) A single leachate sample was collected directly from the SCPD by Gredell Engineering Resources, Inc. in December 2023. The SCPD currently collects WFGD material that was once sluiced to the SCPC until December 2022.

Boron has previously been attributed as a primary indicator for CCR impacts at the site, particularly for bottom and fly ash impacts. As shown in **Table 2**, the FGD leachate material contained in the SCPC (as well as the adjacent SCPD) contains significantly higher concentrations of key indicator parameters than other potential sources at the SEC. The following describes the practicality of each of the key FGD indicators for determining CCR impacts from the SCPC:

- Boron, which is typically the most mobile of CCR-related constituents, would be expected to have the most notable increase if there were impacts from the SCPC/SCPD. Of the key FGD indicators listed above, the boron concentration in SCPD leachate is greatest relative to background groundwater at the site (2,541 times higher concentration in SCPD leachate than average background groundwater). Other key FGD indicators are lower in terms of their relative concentrations in leachate compared to background groundwater. Additionally, boron has low concentrations in the adjacent Missouri and Mississippi Rivers;

[1] Mississippi and Missouri River samples collected September 21 & 22, 2017 and May 8, 2018. Results are available on Ameren's public website at https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports/sioux-energy-center.

therefore, elevated boron is likely from a CCR unit, whether it be the SCPA, SCPB, SCPC, SCPD, or SCL4A.

- Fluoride may be a very good FDG indicator parameter because it is typically mobile in most geological environments and is present in SCPD leachate at a level 248 times greater than average background groundwater concentrations. Background fluoride concentrations are also similar to Mississippi and Missouri River concentrations; therefore, an apparent source of increased fluoride could be from FGD impacts. Fluoride concentrations are also much higher in FGD leachate than SCPA porewater, indicating that if increased fluoride is occurring, it would be suspected that the impacts may be from FGD and not fly ash or bottom ash as managed by the SCPA.
- Chloride may be a good FGD indicator parameter because it is mobile in most geological environments and is present in SCPD leachate at a level 856 times greater than average background groundwater concentrations. However, chloride concentrations can be greatly affected by the use of road salt (NaCl) for road deicing. Chloride concentrations for the DG-xx wells installed south of the UWL were measured as high as 125 mg/L prior to any placement of CCR materials in the UWL (prior to June 30, 2010). Additionally, surface water samples collected from the Mississippi and Missouri Rivers near the SEC average approximately 27 and 23 mg/L of chloride, respectively. Therefore, if chloride concentrations are significantly greater than those other alternative sources (greater than approximately 125 mg/L), then chloride can be a good indicator parameter for FGD impacts. At concentrations lower than this, chloride is less effective as a FGD indicator at the SEC.
- Sulfate may be a good FGD indicator parameter as well because it is mobile in most geological environments and is present at a level 187 times greater than average background groundwater concentrations. However, based on surface water sampling near the SEC, sulfate concentrations in the Mississippi and Missouri Rivers reach up to approximately 196 mg/L. Therefore, if sulfate concentrations are significantly greater than concentrations in the nearby rivers and background groundwater (greater than approximately 200 mg/L), then it may be a good indicator for CCR indicator for fly ash, bottom ash, or FGD impacts. At concentrations lower than this, sulfate is less effective as an FGD indicator at the SEC.
- Calcium may be a useful FDG Indicator parameter; however, it is not always mobile in all geological environments and an understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations. Additionally, calcium concentrations are only 7 times greater in the FGD leachate than average background groundwater at the site. Significant increases in calcium may indicate an FGD impact; however, increases would be expected to be less notable than other key indicators, such as boron and fluoride.

5.3 Concentrations of Key Indicators at DG-3

Figures 2-6 display historical concentrations of each of the key indicator parameters of FGD impacts at monitoring well DG-3. The SCPC was permitted to receive WFGD material beginning in July 2010, and its receipt of WFGD material ceased in December 2022. During that period, there are no distinct increasing trends for any of these parameters, which would be expected if impacts were from the SCPC. Boron and calcium concentrations have remained relatively stable, and fluoride concentrations have decreased. As the most effective indicator of CCR impacts, as discussed above, the presence of stable boron and decreasing fluoride concentrations at DG-3 is strong evidence that FGD impacts are not causing the SSIs at DG-3. Out of these key parameters, chloride and sulfate concentrations exhibit the most historical variability, with transitory increases and decreases not indicative of CCR impacts, but rather natural variability in the aquifer.

Table 3, below, displays concentration ranges of key FGD indicator parameters before, during, and after CCR placement in the SCPC in relation to recently collected data. Pre-CCR placement, sulfate concentrations at DG-3 have been measured as high as 75.0 mg/L, which exceeds the current UPL of 74.45 mg/L and is similar to recent concentrations. Chloride concentrations have displayed significant variability before, during, and after CCR placement in the SCPC, but results from May and July 2024 are elevated compared to previous results.

Table 3: Ranges of Key FGD Indicators Before, During, and After CCR Placement at SCPC

Constituent	Range of Values Prior to SCPC Pemit (before 7/30/2010)	Range of Values during Active Conditions of SCPC (7/30/2010 – 12/14/2022)	Range of Values following final receipt of CCR, prior to May 2024	May 2024 Result	July 2024 Result
Sulfate (mg/L)	57.0 – 75.0	29.7 – 82.0	47.0 – 76.3	75.8	83.3
Fluoride (mg/L)	0.28 – 0.41	ND (<0.12) – 0.49	ND (<0.12) – 0.42	ND (<0.12)	NS
Calcium (µg/L)	134,000 – 172,000	113,000 – 163,000	159,000 – 170,000	164,000	NS
Boron (µg/L)	80.8 – 95.5	62.1 – 108	78.2 – 95.2 J	102	NS
Chloride (mg/L)	5.0 – 9.0	2.7 – 23.0	6.9 – 8.2	26.6	34.0 J

Notes:

1) Unit abbreviations - mg/L – milligrams per liter, µg/L – micrograms per liter.
2) ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
3) NS - Not sampled.
4) J - Result is an estimated value.

Boron, calcium, sulfate, and fluoride results pre-CCR placement are at similar ranges to concentrations observed during and after active conditions of the SCPC. Chloride, which is often affected by the use of road salt on nearby roads, has similar concentrations during active conditions and after final receipt of CCR from the SCPC. With each of these key FGD impact indicators not showing elevated concentrations when compared to previous sampling, there is strong evidence that the elevated chloride and sulfate in May of 2024 are not caused by the SCPC.

5.4 Sulfate Concentrations at the SCPC

Sulfate can be key indicator of potential FGD impacts because high concentrations of sulfate are found ubiquitously in FGD materials with the exception of strongly reducing conditions, and sulfate is relatively mobile in most hydrogeological environments. The groundwater around the SCPC does not demonstrate strongly reducing conditions, such as dissolved oxygen values below 0.5 mg/L, negative oxidation reduction potential (ORP), dissolved iron concentrations above 1 mg/L, nor are hydrogen sulfide odors reported at the SCPC.

Figure 6 displays the full historical set of sulfate concentrations at DG-3 including the period prior to the receipt of CCR. If the SSI was caused by impacts from the SCPC, sulfate concentrations would be expected to increase following the placement of CCR materials. **Figure 6** demonstrates that current sulfate concentrations remain at levels similar to those from pre-CCR placement and are not elevated compared to previous sampling at DG-3.

To further investigate the geochemical variability of sulfate in the UWL area, the historical data from the state UWL wells (located on the south side of the UWL, outside of the interpreted zone of impact form the SCPA) were reviewed. These UWL wells (labeled “DG-xx”) were installed and sampled on at least 9 occasions prior to the receipt of FGD in the SCPC. Each of these DG-xx monitoring wells are screened at approximately the same depth as DG-3 in the shallow zone of the alluvial aquifer. **Figure 7** displays a box and whisker plot of the sulfate concentrations for the DG-xx wells prior to the receipt of FGD in the SCPC (any CCR placement south of Highway 94), which represents natural variability in local groundwater chemistry. Using all pre-disposal data from the 12 DG-xx wells, the non-parametric UPL for sulfate is 83 mg/L (highest results from DG-4 located 675 feet southeast of DG-3). As displayed in **Figure 7**, the May 2024 sampling results at DG-3 is within the pre-CCR sampling UPL for the nearby DG-xx wells.

Based on these data, the variability in sulfate concentrations over time is not a result of CCR influence on the groundwater from the SCPC. Additionally, sulfate concentrations within the Missouri River to the south of the SEC averaged approximately 192 mg/L, as shown in **Table 2**, which is significantly greater than the SSI concentration at DG-3. The Missouri River is a potential alternative source of sulfate to the groundwater at the SEC and likely contributes to the sulfate variability at the site. Further discussion of river impacts and groundwater flow is presented in Section 5.5.1. The SSI for sulfate is likely a result of geochemical variability of the aquifer that has not been captured by groundwater sampling to-date.

5.5 Chloride Concentrations at the SCPC

Chloride is not known to be a key indicator of fly ash or boiler slag/bottom ash (EPRI 2012) but can be an indicator for FGD type wastes and is commonly found in shallow groundwater systems near salt and brine treated roadways. The nearest public roadway to DG-3 is Dwiggins Road, located approximately 120 feet to the south of the well. Dwiggins Road is a paved road that receives salt treatment as needed during the winter months for ice control.

Figure 4 displays historical chloride concentrations at monitoring well DG-3. As shown in the figure, prior to the May 2024 sampling event, there have been two results greater than the current UPL of 17.26 mg/L (22.0 mg/L on 8/13/2014 and 23.0 on 8/4/2015). Other results prior to May 2024 are below the current UPL but exhibit reasonable variability between 2.7 to 17.0 mg/L. Changes in chloride concentrations do not appear to correspond with placement of CCR. At the time of this ASD, data from the November 2024 semiannual sampling event is available, and the chloride concentration at DG-3 was 14.7 mg/L on 11/15/2024, which is less than the current UPL, further demonstrating the variability of chloride at this well.

Figure 8 is a box & whiskers plot of chloride data collected from monitoring wells closest to DG-3, prior to CCR placement in the SCPC. The same date range and monitoring wells are included in this figure as displayed for sulfate in **Figure 7**. As shown, chloride concentrations before CCR placement in the SCPC were much greater in monitoring wells south of Dwiggins Road when compared with DG-3 and DG-2 to the north. Chloride at DG-4 during that time ranged from 9.0 to 86.0 mg/L, with an average of 44.4 mg/L. The presence of higher chloride concentrations just south of DG-3 that predate CCR placement in the SCPC displays that elevated chloride, likely from application of road salt for deicing, is present at the site and is a likely alternative source. **Figure 9** compares historical chloride concentrations at DG-3 and DG-4, further demonstrating that chloride concentrations are typically much greater just to the south of Dwiggins Road. Chloride concentrations at DG-4 display an increased level of variability, which would be consistent with isolated applications of road salt along Dwiggins Road. It would be expected that chloride levels would increase in the shallow alluvial aquifer following road salt application, and concentrations would decrease over time as dispersion and advection occur according to groundwater flow patterns.

5.5.1 Groundwater Flow Evaluation

In an effort to further demonstrate the recent chloride SSI at DG-3 is sourced from higher chloride concentrations to the south along Dwiggins Road from road salt application, a river level evaluation was conducted similar to a previous ASD for the SCPC, included in the 2023 Annual Report for the SCPC (Rocksmith 2024). Groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, which affect water levels, gradients and flow directions in the aquifer. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. At this facility, groundwater can flow north or south toward the Mississippi and Missouri Rivers, depending on river levels.

River level elevations for the site can be estimated using nearby United State Geological Survey (USGS) gauges. Four nearby gauges are used to calculate the approximate river level of the Mississippi and Missouri Rivers at the SEC:

- Grafton Illinois gauge on the Mississippi (USGS #05587450).
- Alton Illinois gauge on the Mississippi River (USGS # 05587500)
- St. Louis Missouri gauge on the Mississippi River (USGS #07010000)

- St. Charles Missouri gauge on the Missouri River (USGS #06935965)

Daily water gauge measurements are available for the four gauges since at least November 15, 1986. **Figure 10** summarizes the calculated Missouri and Mississippi River elevations at the plant using available historical daily gauge data. The Mississippi River level at the SEC is controlled by a series of locks and dams, with the nearest one being approximately 6 miles downriver at the Mel Price Alton Lock and Dam. This dam controls the river elevation on the Mississippi River near the SEC, minimizing impacts from flooding and drought and giving the Mississippi River a more consistent elevation, as displayed on **Figure 10**. The Missouri River does not have any dams located near the SEC, with the closest dam on the Missouri River being the Gavins Point Dam, located near Yankton, South Dakota. Therefore, the Missouri River is susceptible to larger variations in elevation caused by flooding and drought, as displayed in **Figure 10**.

Figure 11 displays the difference between the Mississippi and Missouri Rivers for each day since 2008, when groundwater data collection began at DG-3 and DG-4. When the Mississippi River is higher than the Missouri River, groundwater flow across the site is typically southward, and vice versa. **Table 4** provides a summary comparison of the Mississippi and Missouri River elevations at the SEC. Using the data from January 1, 1987 to December 16, 2024, the Mississippi River was higher than the Missouri River on 7,771 of the 13,865 days (approximately 56% of the time), meaning that groundwater flow across the site is southward more often than northward. However, there are periods of time where groundwater flow is northward, as shown in **Figure 11** and **Table 4**. Groundwater flow patterns across the SEC have been confirmed by onsite water level measurements. Prior to each quarterly sampling event, water levels are recorded at all monitoring wells to determine groundwater flow rates and direction.

Table 4 – Summary of Mississippi and Missouri River Elevations

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
1987	243	122	-1.38
1988	82	284	1.48
1989	41	324	2.24
1990	162	203	0.32
1991	92	273	1.34
1992	152	214	-0.20
1993	355	10	-3.05
1994	166	199	-1.17
1995	269	96	-1.62
1996	242	124	-0.98
1997	312	53	-1.70
1998	317	48	-2.21
1999	207	158	-1.15
2000	28	338	2.30
2001	133	232	0.66
2002	63	302	2.18
2003	28	337	3.12
2004	125	241	1.08
2005	88	277	1.91
2006	11	354	4.05
2007	141	224	0.71
2008	209	157	-0.29
2009	202	163	-0.32

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers (Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
2010	296	69	-1.79
2011	229	136	-1.58
2012	59	307	2.15
2013	51	314	2.46
2014	88	277	1.54
2015	177	188	-0.36
2016	196	170	-0.55
2017	154	211	0.46
2018	232	133	0.03
2019	349	16	-3.08
2020	234	132	-0.72
2021	160	205	0.31
2022	77	288	2.39
2023	20	345	3.38
2024	104	247	1.07
Total	**6094**	**7771**	**Average Difference – 0.34 feet**

Under southward flow conditions, elevated chloride concentrations along Dwiggins Road would move southward, away from DG-3. However, during periods when flow is northward, elevated concentrations would move northward, and potentially contribute to increased concentrations at that well. In addition to May and July 2024, there were temporary increased chloride concentrations at DG-3 thought portions of 2014 through 2016 (see **Figure 4**). As shown in **Figure 11**, there were periods during which flow across the site was northward, concurrent with these increased chloride results at DG-3. Most recently, from late April to late July 2024 flow across the site was northward, which corresponds with elevated results in May and July 2024. Flow returned largely southward in the latter half of 2024, when chloride was measured at 14.7 mg/L in November 2024.

Altogether, groundwater flow patterns across the site are variable, and would allow for increased chloride concentrations along Dwiggins Road to be temporarily advanced northward to DG-3. Variability in chloride concentrations at wells DG-3 and DG-4 are indicative of impacts from punctuated road salt application events and influenced by dynamic groundwater flow patterns. Additionally, this river-controlled flow pattern likely contributes to variability of sulfate in site groundwater discussed in Section 5.4, as the Missouri River contains relatively high sulfate concentrations compared to groundwater in the vicinity of DG-3.

6.0 DEMONSTRATION THAT STATISTICALLY SIGNIFICANT INCREASES WERE NOT CAUSED BY SCPC IMPACTS

Based on the information presented in Section 5.0 above, the SSIs of chloride and sulfate at monitoring well DG-3 from the May 2024 detection monitoring event are not a result of impacts from the SCPC. The following lines of evidence support this claim:

- Key FGD indicator parameters such as boron, fluoride, calcium, and sulfate are not elevated at DG-3 when compared to previous sampling results.
- Variable sulfate and chloride concentrations that are greater than those at DG-3 exist immediately to the south/southeast of DG-3, which predate CCR placement in the SCPC.

- Concentrations at DG-3 are influenced by variable groundwater flow directions at the site, which at times flows northward from areas of elevated concentrations along Dwiggins Road, which receives road salt for winter ice control.

Along with these lines of evidence listed above, the SCPC is documented to be constructed with an engineered compacted clay liner overlain by a 60-mil HDPE geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts.

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Tables

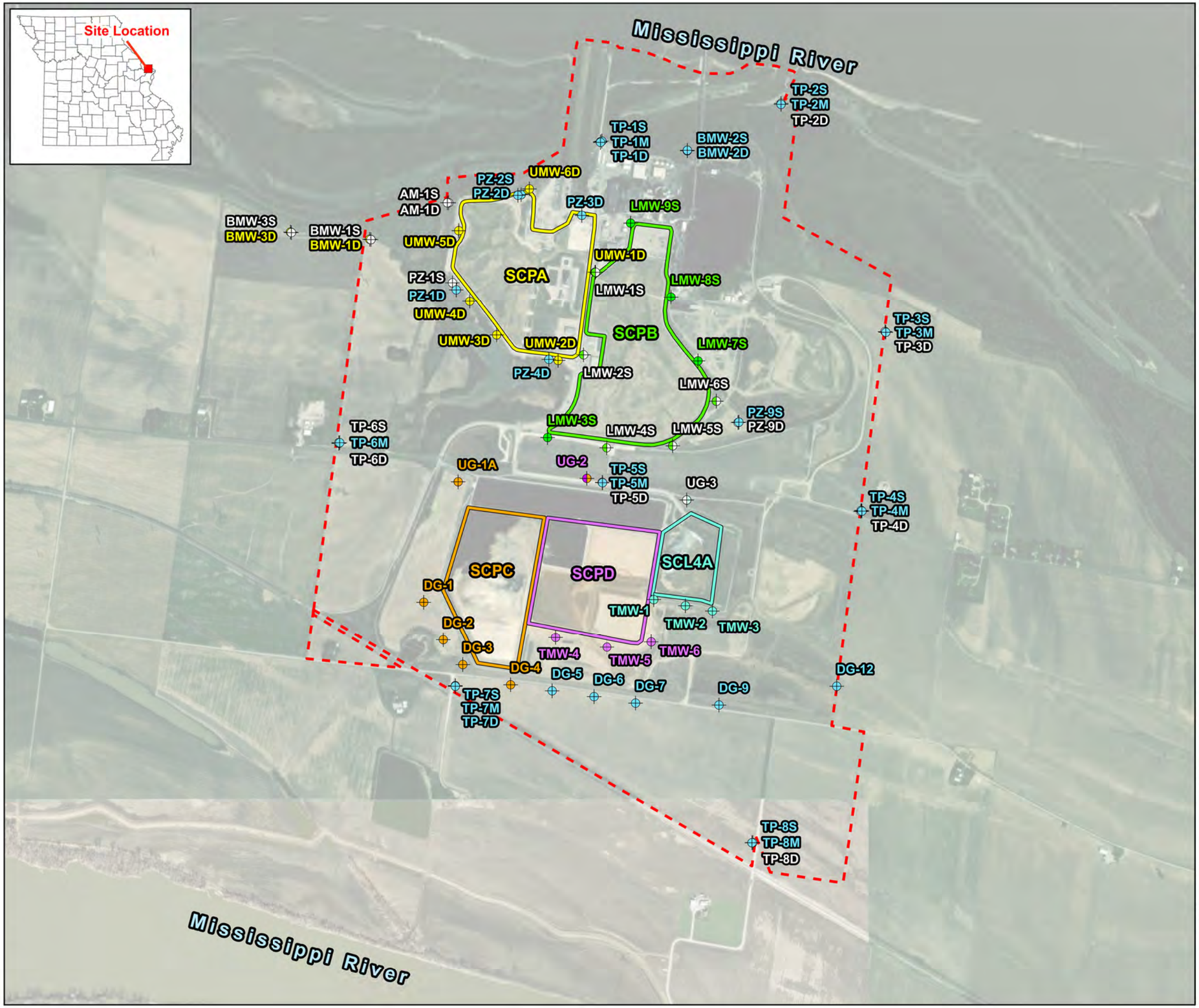
Table 1
May 2024 Detection Monitoring Results
SCPC Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS											
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
May 2024 Detection Monitoring Event															
DATE	NA	5/28/2024	5/28/2024	NA	5/30/2024	NA	5/28/2024	NA	5/30/2024	NA	5/30/2024	NA	5/30/2024	NA	5/30/2024
pH	SU	6.86	6.95	6.433 - 7.279	7.04	6.29 - 7.5	7.04	6.565 - 7.38	7.13	6.725 - 7.268	7.09	6.66 - 7.227	7.06	6.638 - 7.221	6.99
BORON, TOTAL	µg/L	58.1 J	54.1 J	453.4	408	277.7	143	118.3	94.2 J	113.2	102	103.2	102	114.1	94.5 J
CALCIUM, TOTAL	µg/L	133,000	116,000	203,439	124,000	143,772	87,100	174,000	147,000 J	166,000	150,000	169,490	164,000	166,717	152,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	147.8	82.7	93.74	6.7	10.0	11.2 J	10.93	5.6	17.26	26.6	155.7	14.9
FLUORIDE, TOTAL	mg/L	ND	ND	0.47	ND	0.34	ND	0.41	0.16 J	0.49	ND	0.49	ND	0.48	ND
SULFATE, TOTAL	mg/L	37.7	19.7	113.4	92.3	93.63	35.8	69.58	64.7 J	68	95.4 J	74.45	75.8	79.91	65.2
TOTAL DISSOLVED SOLIDS	mg/L	470	529	819.5	667	657.3	335	552.3	531	537	574	617.9	591	680.5	597
July 2024 Verification Sampling Event															
DATE	NA								7/30/2024		7/30/2024		7/29/2024		
pH	SU														
BORON, TOTAL	µg/L														
CALCIUM, TOTAL	µg/L														
CHLORIDE, TOTAL	mg/L								8.9				34.0 J		
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L										43.9		83.3		
TOTAL DISSOLVED SOLIDS	mg/L										485				

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
5. Prediction Limits calculated using Sanitas Software.
6. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
8. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JTR
Checked By: JTA
Reviewed By: MNH

Figures



TITLE

SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

Legend

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)

Utility Waste Landfill Cells

- SCPC - FGD Surface Impoundment (Closed)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

Monitoring Well Networks

- Corrective Action Monitoring Well
- SCPA Detection and Assessment Monitoring Well
- SCPB and Corrective Action Monitoring Well
- SCPB Detection Monitoring Well
- SCPC Detection Monitoring Well
- SCPD and SCPC Detection Monitoring Well
- SCPD Detection Monitoring Well
- SCL4A and Corrective Action Monitoring Well
- SCL4A Detection Monitoring Well
- Monitoring Well Used for Water Level Elevation Measurements Only

NOTES

1. All boundaries and locations are approximate.
2. FGD - Flue Gas Desulfurization.
3. CCR - Coal Combustion Residuals.

REFERENCES

1. Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.

0 500 1,000 2,000 3,000 Feet

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

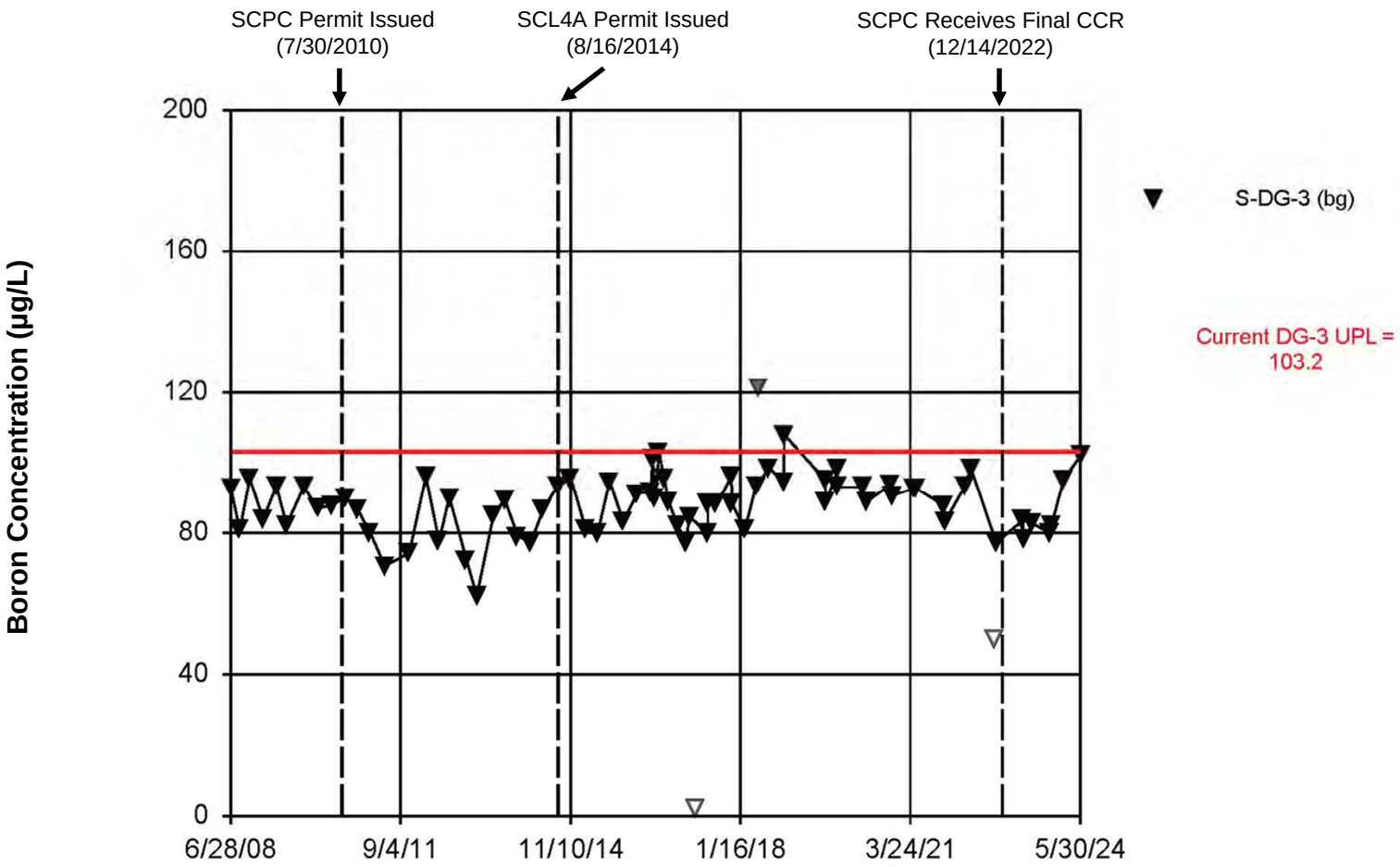
CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

Ameren

ROCKSMITH GEOENGINEERING

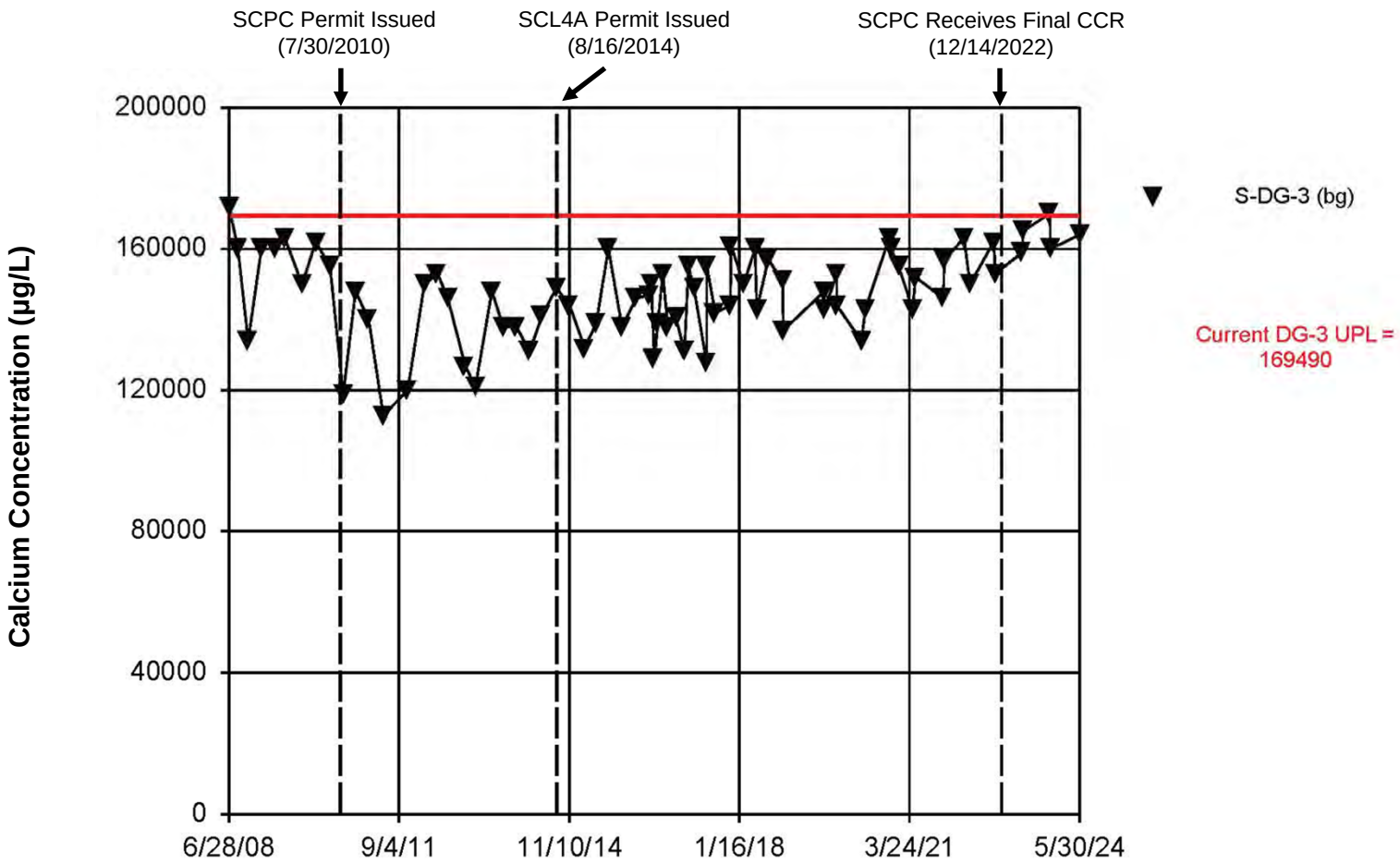
DESIGN	JSI	YYYY-MM-DD	2024-12-04
PREPARED	JSI	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1



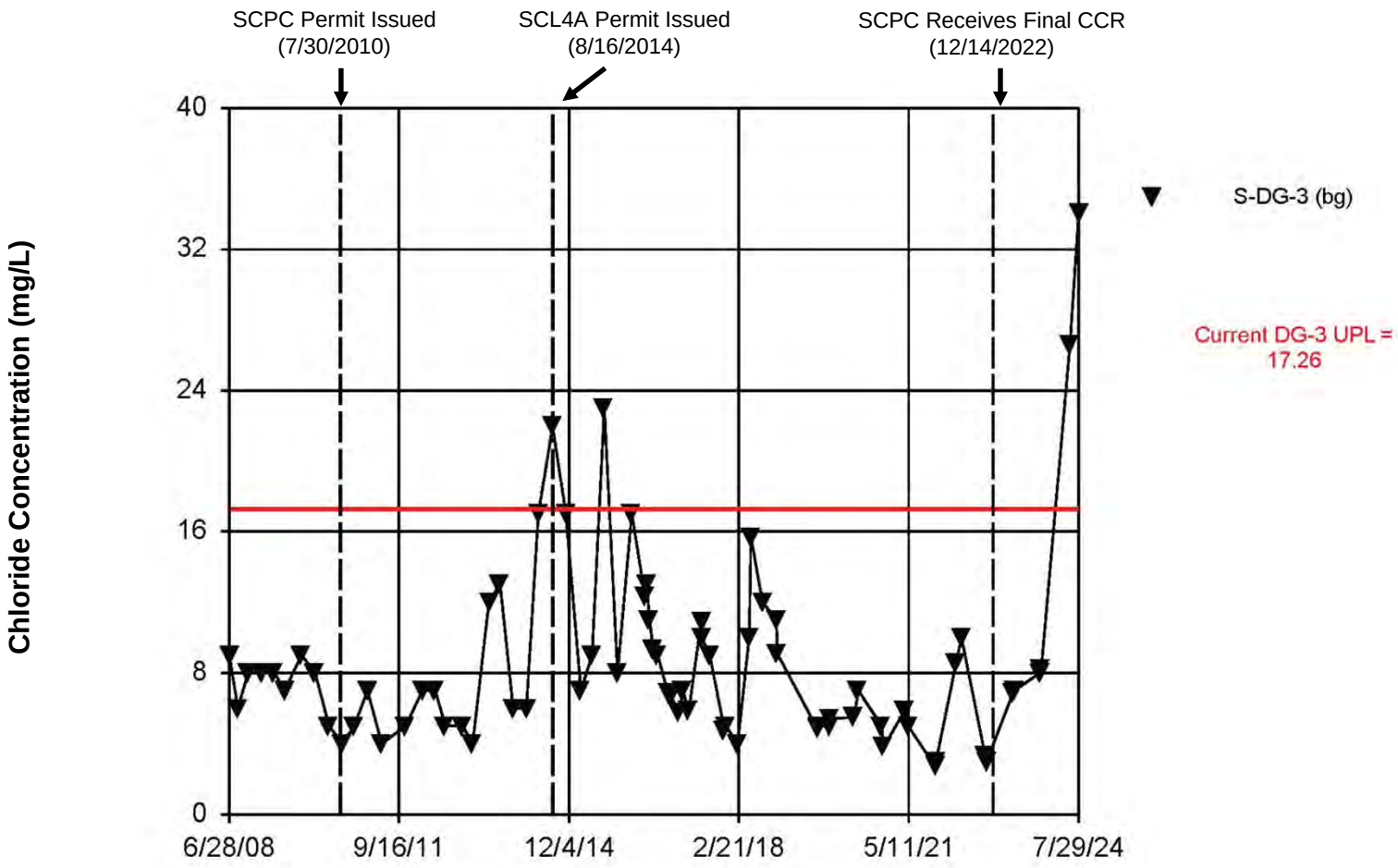
Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.
4) Hollow symbols indicate non-detect values. Non-detects plotted as ½ the Method Detection Limit.
5) Symbols disconnected from trend line are flagged as outliers.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				**Timeseries Plot of Boron Concentrations at DG-3**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
GTM	JTR	MNH	2024-12-23	NA	23009-24	**2**



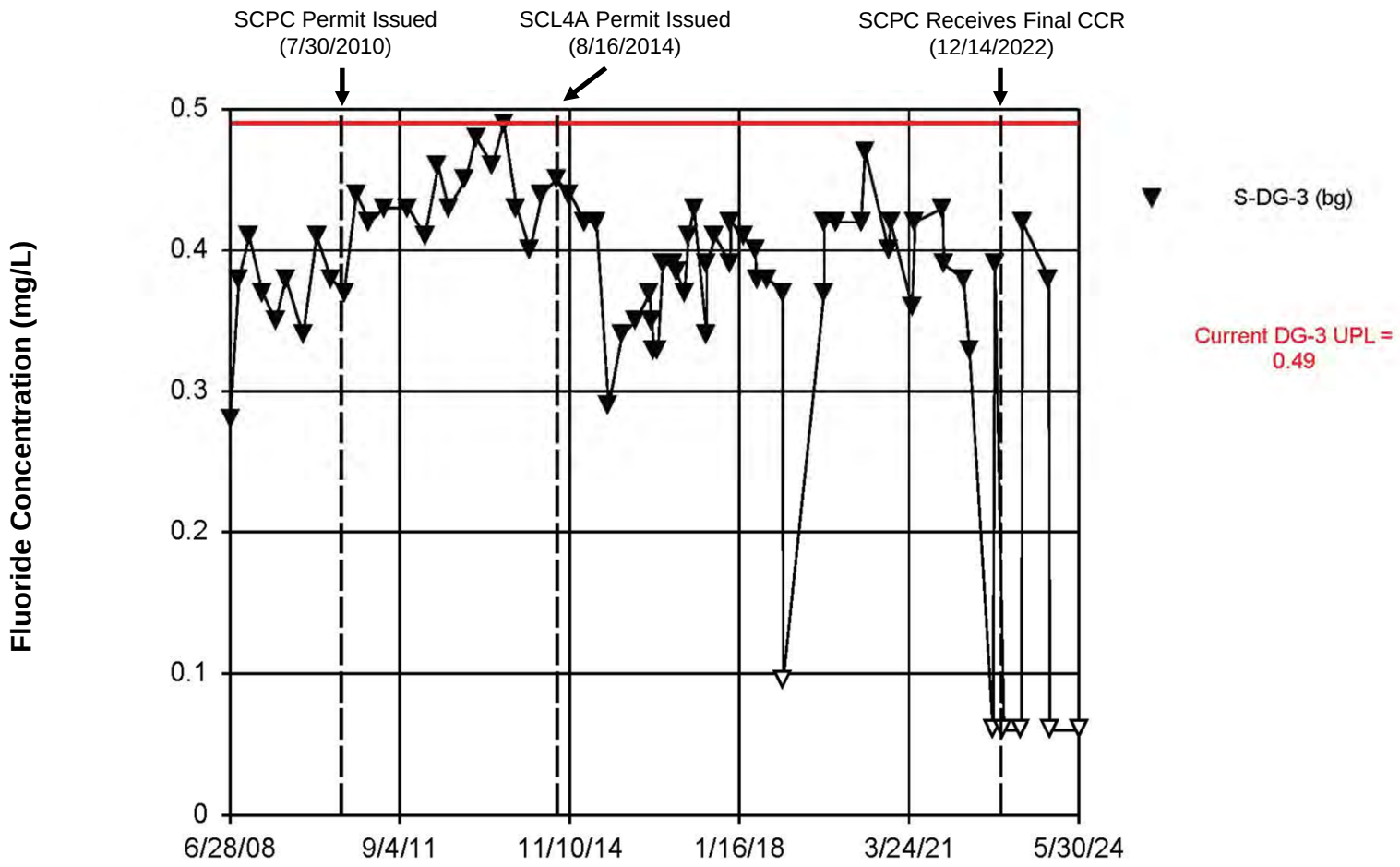
Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Timeseries Plot of Calcium Concentrations at DG-3**		
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23	Rev No. NA	JOB NO. 23009-24	FIGURE **3**



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.

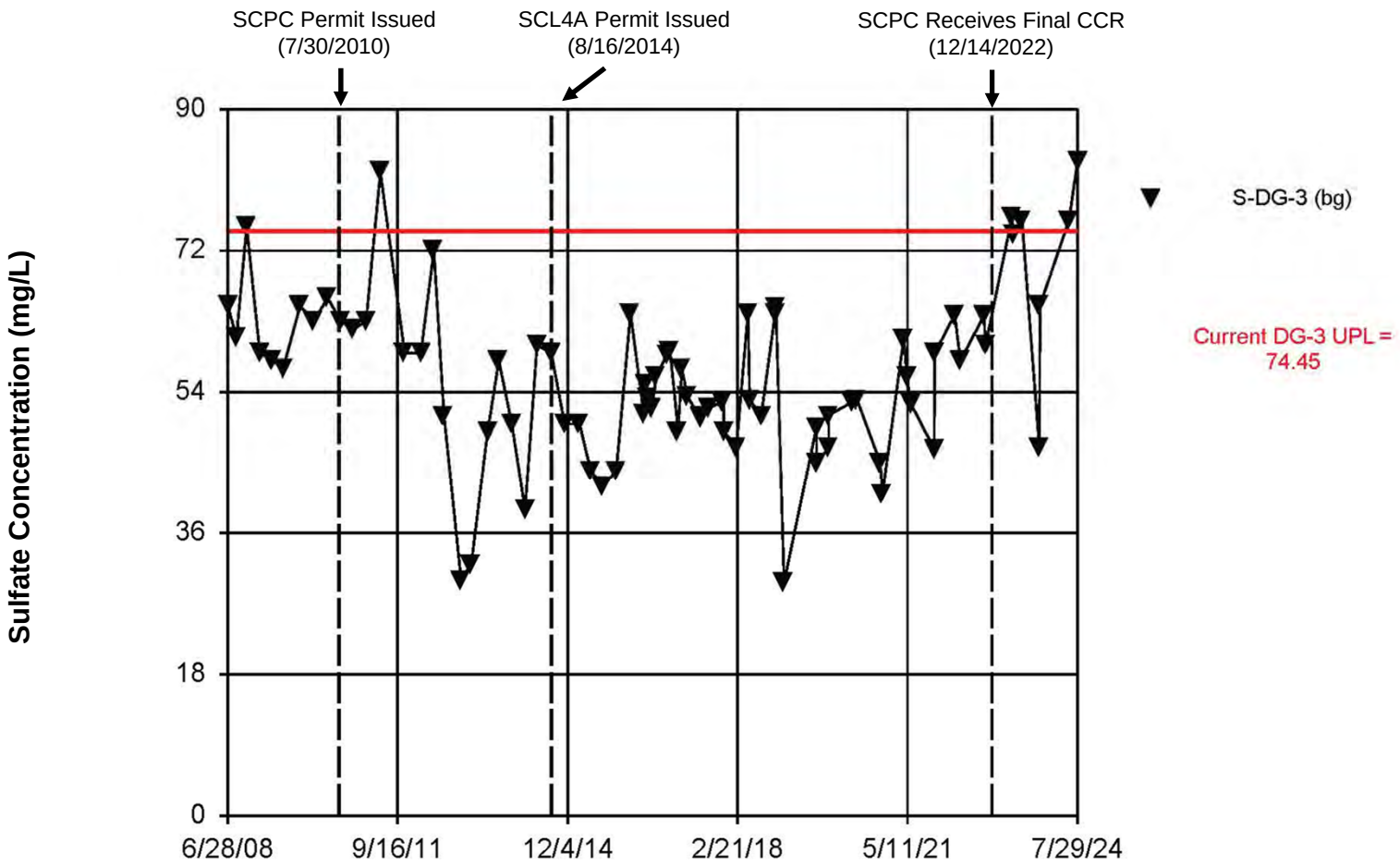
CLIENT/PROJECT **AMEREN MISSOURI** **SIOUX ENERGY CENTER**					TITLE **Timeseries Plot of Chloride Concentrations at DG-3**	
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23		Rev No. NA	JOB NO. 23009-24	FIGURE **4**



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.
4) Hollow symbols indicate non-detect values. Non-detects plotted as ½ the Method Detection Limit.

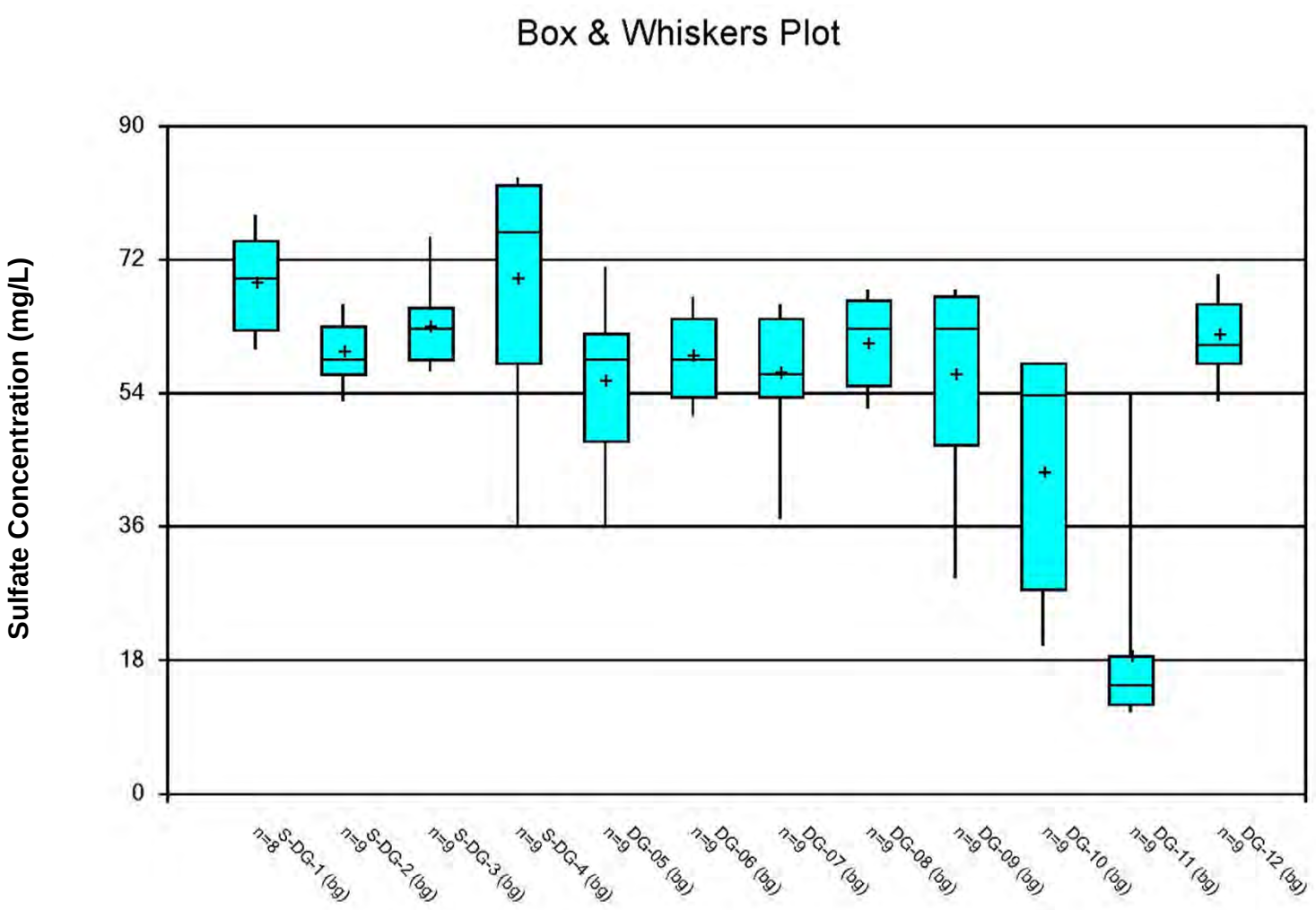
CLIENT/PROJECT				TITLE
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Timeseries Plot of Fluoride Concentrations at DG-3**
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23	Rev No. NA / JOB NO. 23009-24 / FIGURE **5**

ROCKSMITH GEOENGINEERING



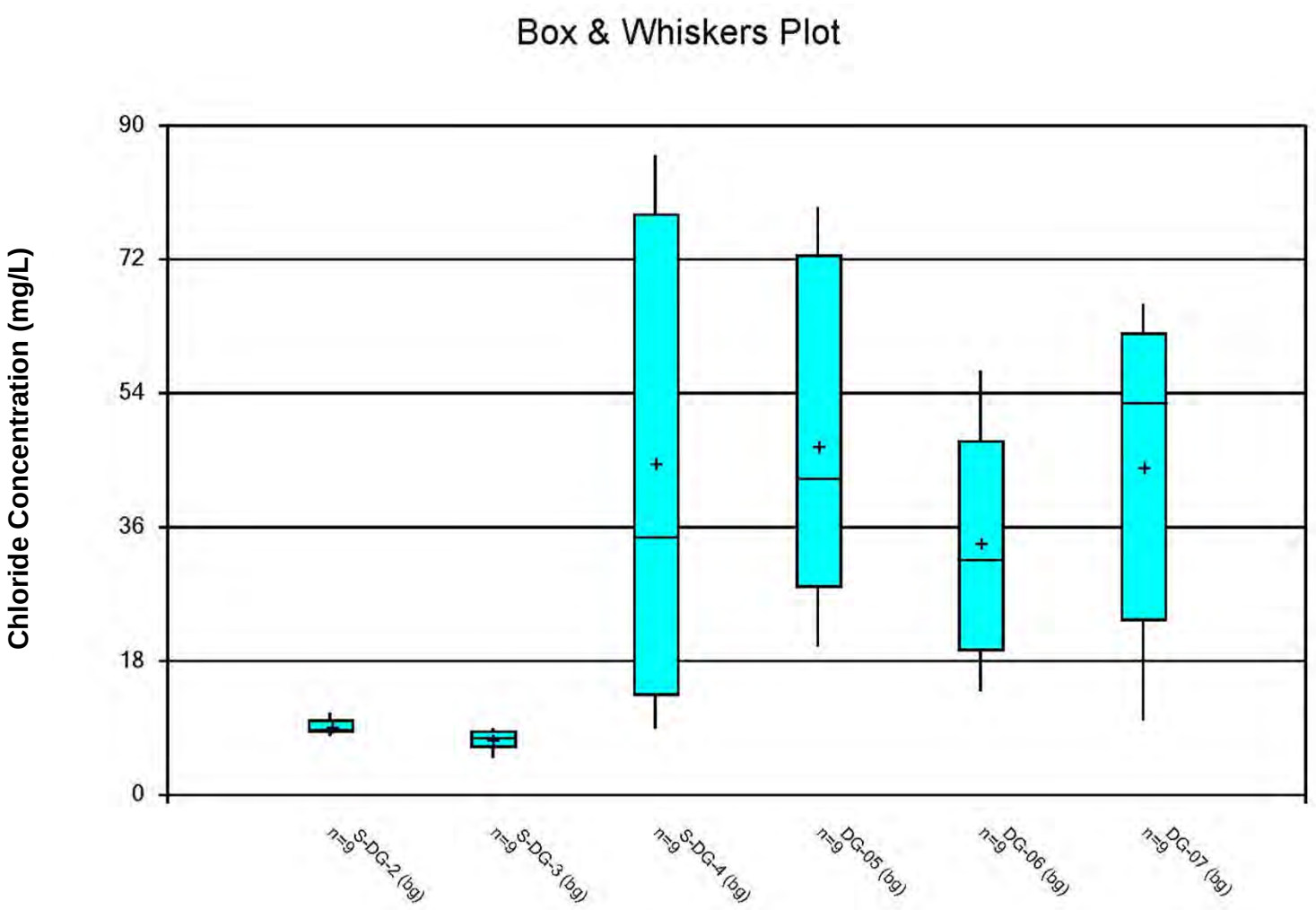
Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Timeseries Plot of Sulfate Concentrations at DG-3**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
GTM	JTR	MNH	2024-12-23	NA	23009-24	**6**



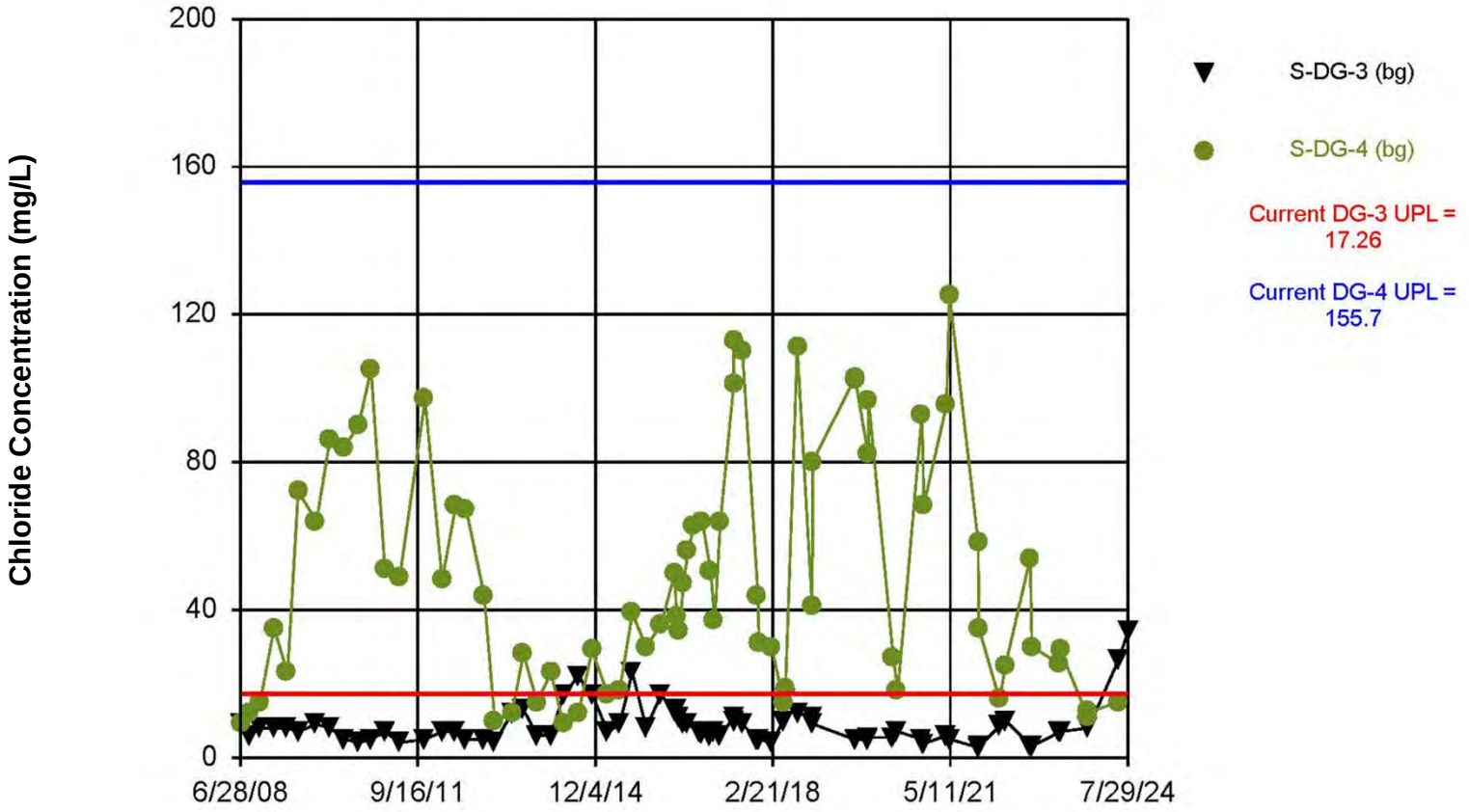
Notes
1) mg/L – Milligrams per liter.
2) Sulfate results collected pre-CCR placement in the SCPC are displayed (June 2008 – May 2010).

CLIENT/PROJECT **AMEREN MISSOURI** **SIOUX ENERGY CENTER**					TITLE **Box and Whiskers Plot of Sulfate Concentrations Pre-CCR Placement at SCPC**	
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23	ROCKSMITH GEOENGINEERING	Rev No. NA	JOB NO. 23009-24	FIGURE **7**



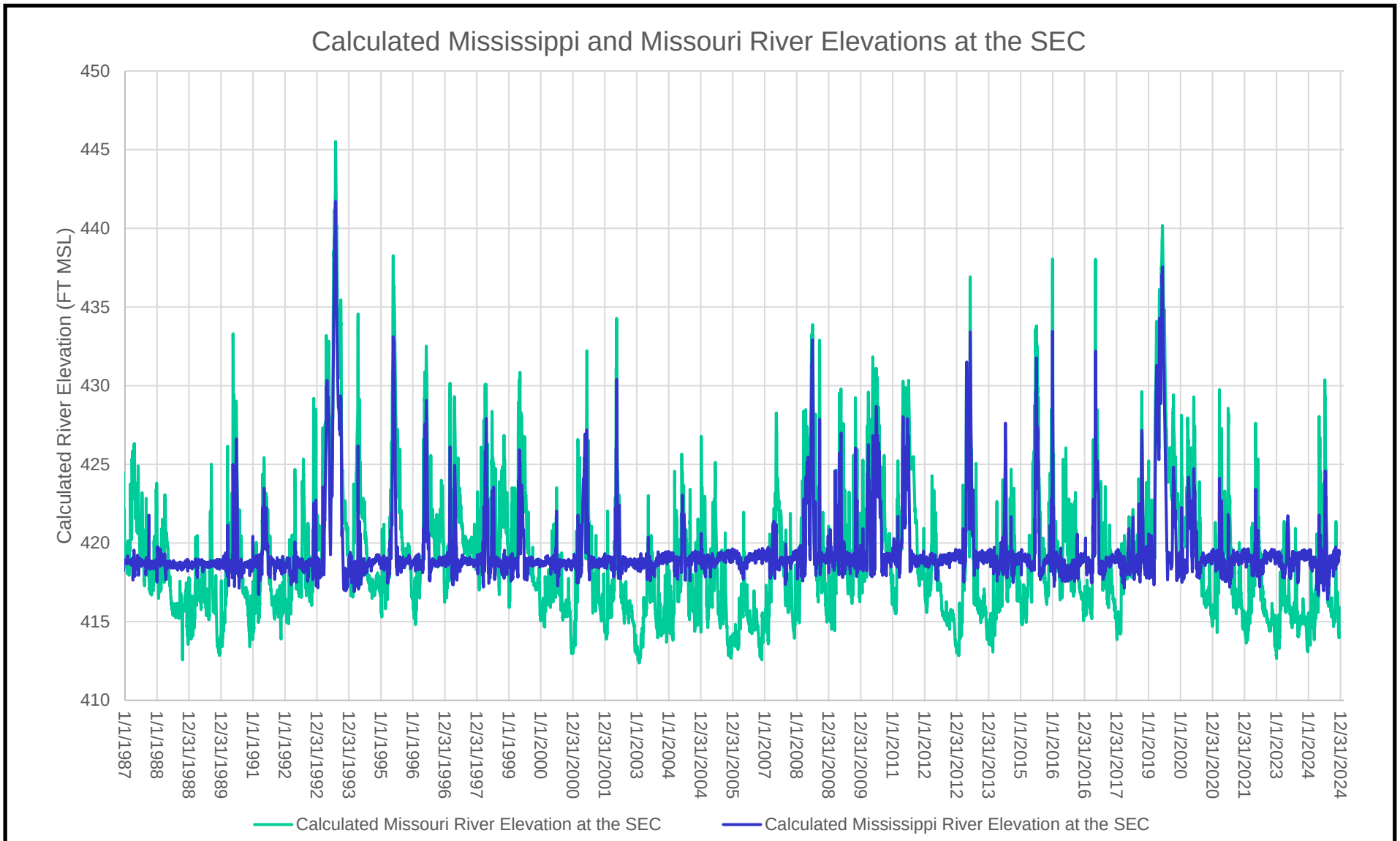
Notes
1) mg/L – Milligrams per liter.
2) Sulfate results collected pre-CCR placement in the SCPC are displayed (June 2008 – May 2010).

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Box and Whiskers Plot of Chloride Concentrations Pre-CCR Placement at SCPC**		
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23	Rev No. NA	JOB NO. 23009-24	FIGURE **8**



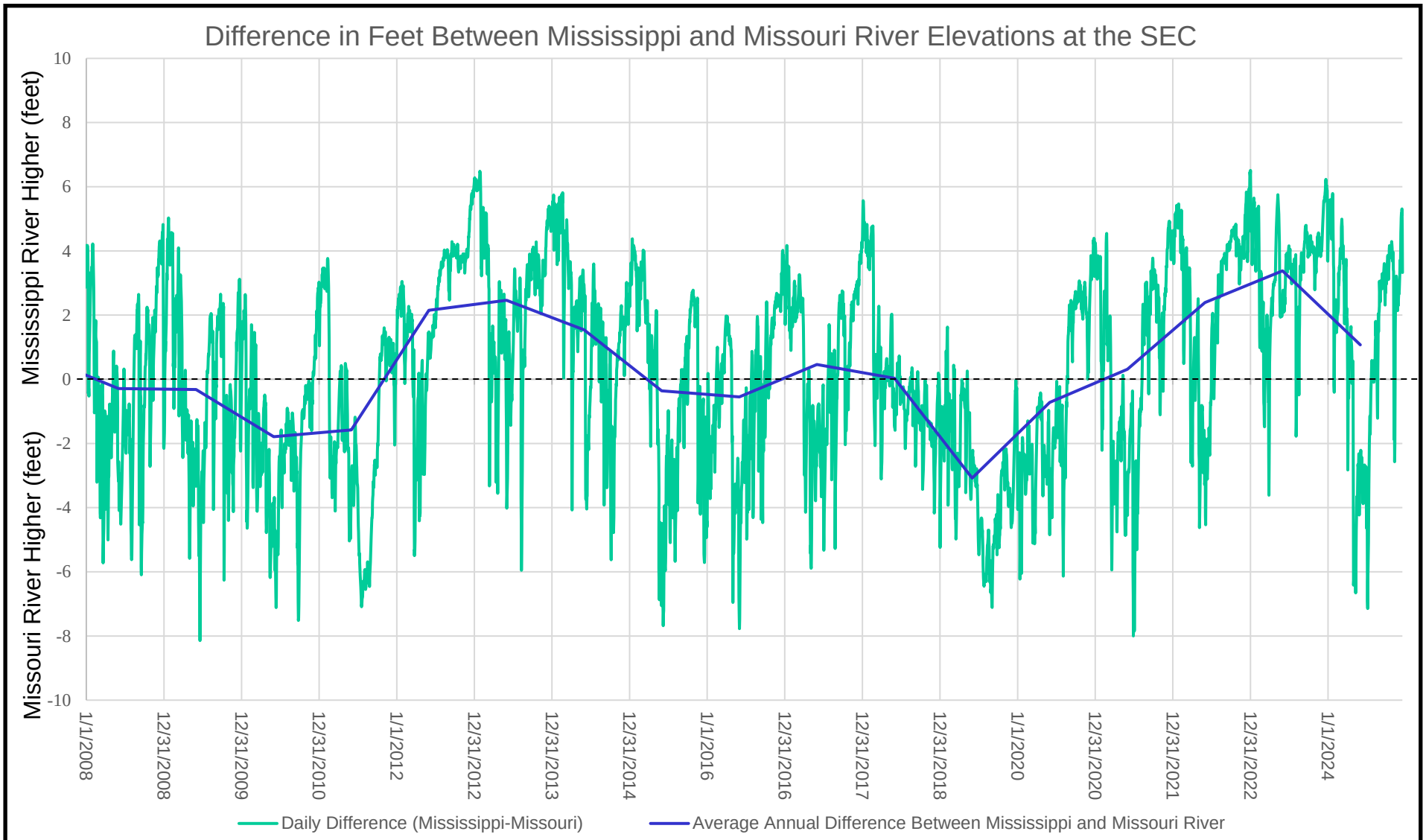
Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				ROCKSMITH GEOENGINEERING	**Timeseries Plot of Chloride Concentrations at DG-3 and DG-4**		
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-23		Rev No. NA	JOB NO. 23009-24	FIGURE **9**



Notes
1) River levels calculated based on USGS river gauge values near the SEC.

CLIENT/PROJECT **AMEREN MISSOURI SIOUX ENERGY CENTER**					TITLE **Calculated Mississippi and Missouri River Elevations at the SEC**	
DRAWN GTM	CHECKED JTR	REVIEWED MNH	DATE 2024-12-27		Rev No. NA	JOB NO. 23009-24	FIGURE **10**



Notes

1) Results in feet, values displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation.

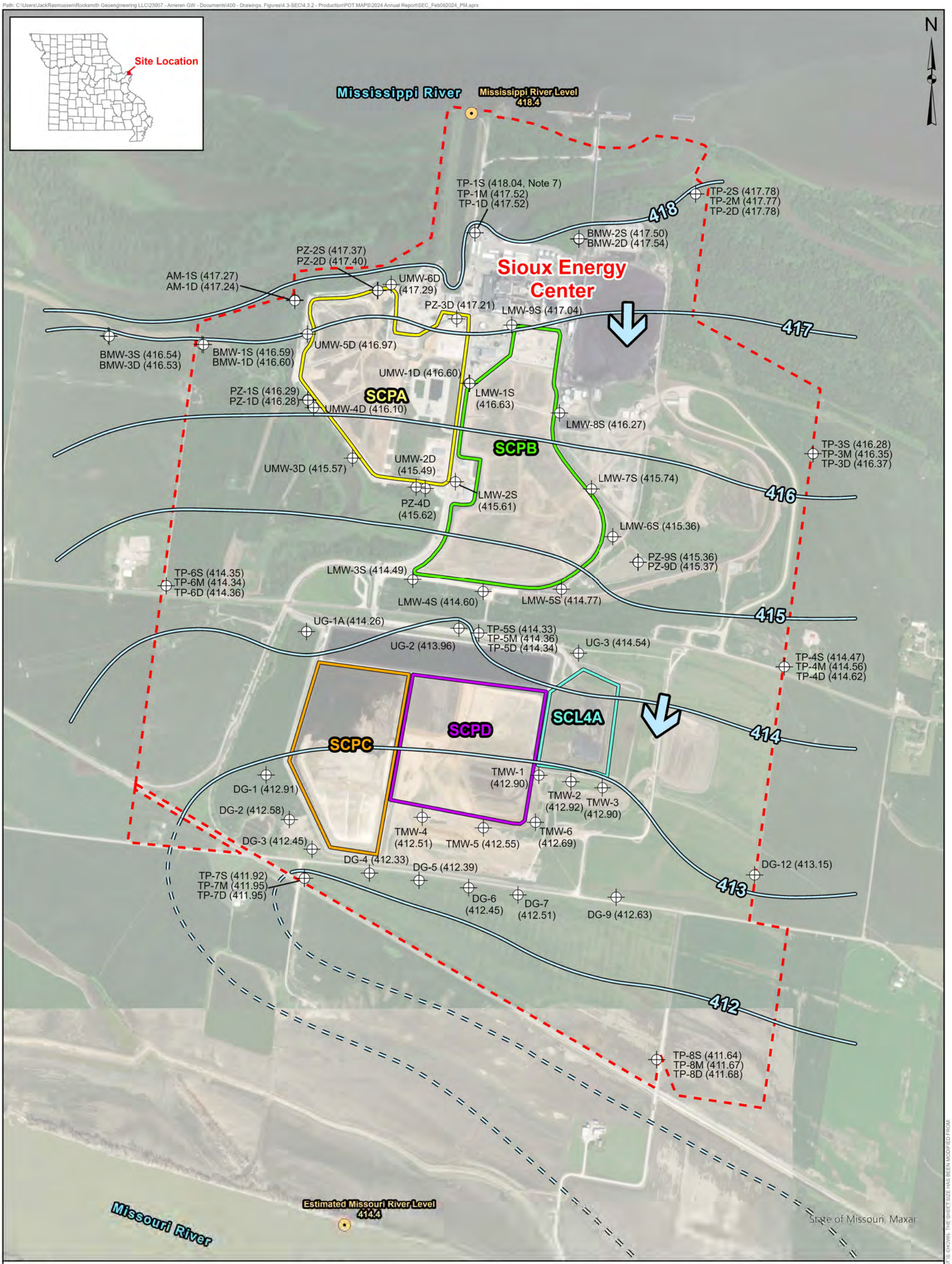
CLIENT/PROJECT				TITLE
AMEREN MISSOURI SIOUX ENERGY CENTER				**Difference in Feet Between Mississippi and Missouri River Elevations at the SEC**
DRAWN	CHECKED	REVIEWED	DATE	Rev No. / JOB NO. / FIGURE
GTM	JTR	MNH	2024-12-27	NA / 23009-24 / **11**

ROCKSMITH GEOENGINEERING

Appendix D

2024 Potentiometric Surface Maps

Path: C:\Users\JackRasmussen\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2024 Annual Report\SEC_Feb062024_PM.aprx



LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closed)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer
- Groundwater Flow Direction

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.
7.) TP-1S NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

REFERENCES

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

TITLE
FEBRUARY 6, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2024-07-03
PREPARED	JTA	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE D1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM

Path: C:\Users\JackRasmussen\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2024 Annual Report\SEC_May242024_PM.aprx

N

Mississippi River

Mississippi River Level
417.4

Sioux Energy Center

TP-2S (417.05)
TP-2M (417.07)
TP-2D (417.06)

TP-1S (417.27)
TP-1M (417.35)
TP-1D (417.40)

BMW-2S (417.26)
BMW-2D (417.29)

AM-1S (417.90)
AM-1D (417.90)

UMW-6D (417.64)

PZ-2S (417.81)
PZ-2D (417.84)

PZ-3D (417.84)

LMW-9S (417.72)

UMW-5D (417.91)

BMW-3S (418.16)
BMW-3D (418.13)

BMW-1S (418.04)
BMW-1D (418.02)

UMW-1D (417.86)

PZ-1S (418.05)
PZ-1D (418.05)

SCPA

LMW-1S (417.88)

LMW-8S (417.62)

UMW-4D (417.97)

UMW-3D (417.92)

SCPB

TP-3S (417.15)
TP-3M (417.16)
TP-3D (417.20)

LMW-2S (417.78)

LMW-7S (417.57)

PZ-4D
(418.03)

UMW-2D (417.89)

LMW-6S (417.45)

PZ-9S (417.60)
PZ-9D (417.61)

LMW-3S (417.99)

TP-6S (418.32)
TP-6M (418.30)
TP-6D (418.32)

LMW-4S
(417.80)

LMW-5S (417.68)

UG-2 (417.71)

UG-1A (418.54)

TP-5S (418.00)
TP-5M (418.04)
TP-5D (418.03)

UG-3 (418.06)

TP-4S (417.04)
TP-4M (417.11)
TP-4D (417.13)

SCPC

SCPD

SCL4A

DG-1 (419.11)

TMW-1 (418.05)

TMW-2 (417.99)

TMW-3 (417.97)

DG-2 (419.21)

TMW-4 (418.58)

TMW-5 (418.45)

TMW-6 (418.33)

DG-3 (419.22)

DG-5 (419.02)

418

DG-12 (417.97)

TP-7S (418.98)
TP-7M (418.98)
TP-7D (418.99)

DG-4
(419.11)

DG-6 (418.87)

DG-7 (418.81)

DG-9 (418.41)

TP-8S (418.30)
TP-8M (418.30)
TP-8D (418.31)

419

Estimated Missouri River Level
420.6

Missouri River

420

State of Missouri, Maxar

LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closed)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer
- Groundwater Flow Direction

NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.

REFERENCES

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

TITLE
MAY 24, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

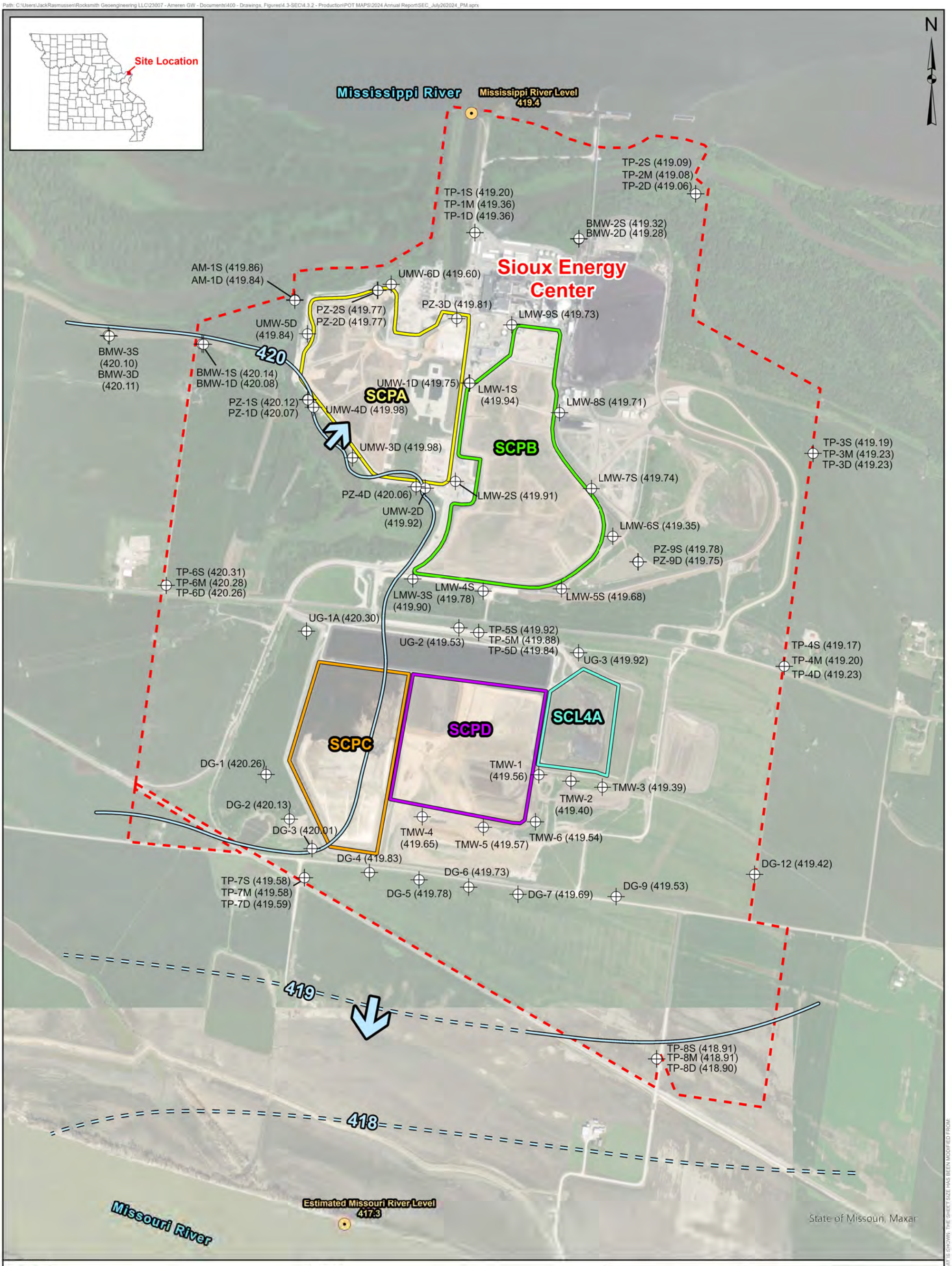
ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2024-07-03
PREPARED	JTA	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE D2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:

Path: C:\Users\JackRasmussen\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2024 Annual Report\SEC_July262024_PM.aprx



LEGEND

- Sioux Energy Center Property Boundary

CCR Units

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1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

TITLE
JULY 26, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

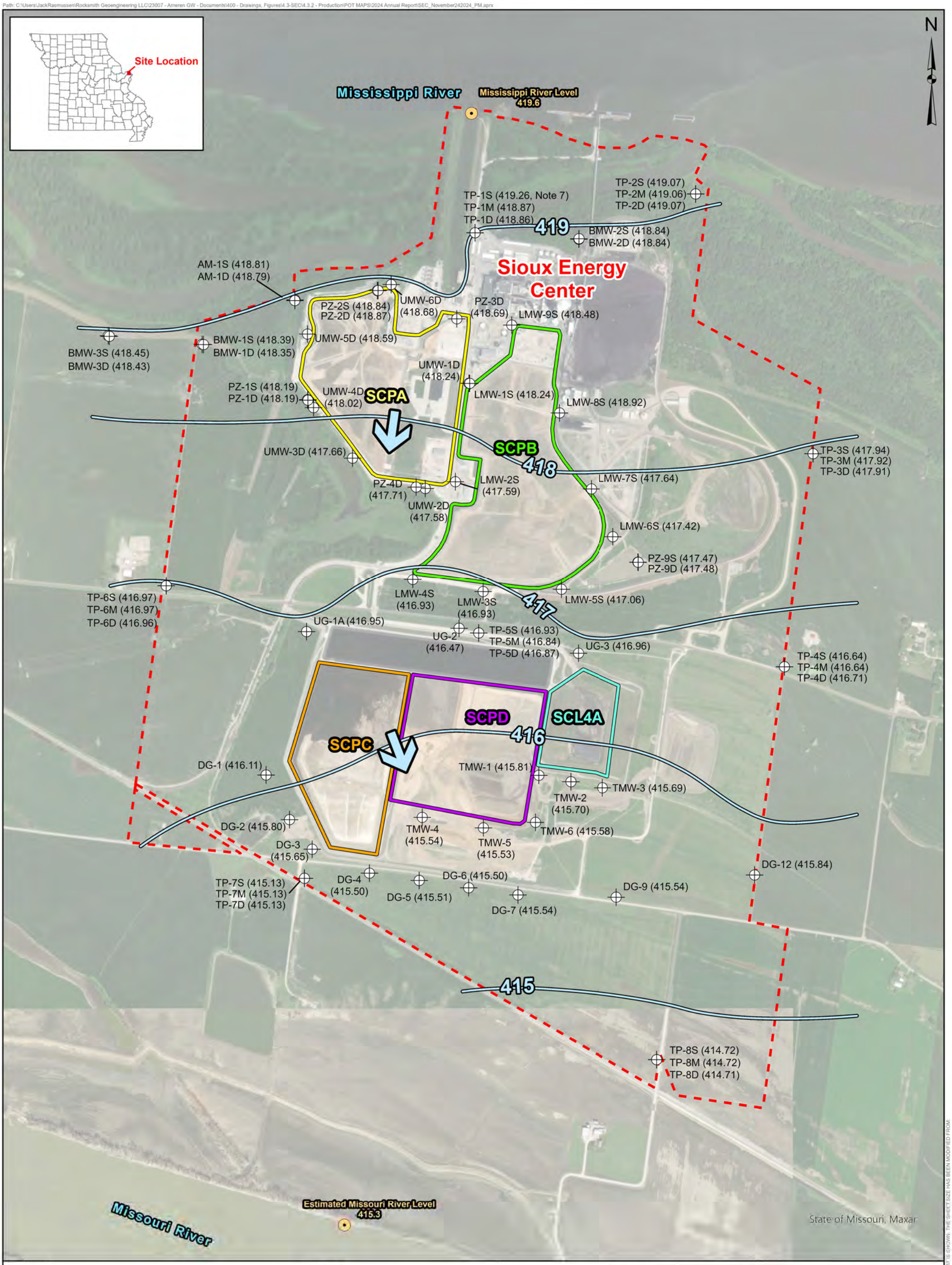
ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2024-09-11
PREPARED	JTR	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE D3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:

Path: C:\Users\JackRasmussen\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2024 Annual Report\SEC_November242024_PM.aprx



LEGEND

- Sioux Energy Center Property Boundary

CCR Units

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closed)
- SCL4A - Dry CCR Disposal Area
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- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- River Gauge Location
- Monitoring Well or Piezometer
- Groundwater Flow Direction

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5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.
7.) TP-1S NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

REFERENCES

1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).

0 500 1,000 1,500 2,000 Feet

TITLE
NOVEMBER 14, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

DESIGN	GTM	YYYY-MM-DD	2024-12-19
PREPARED	JTR	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE D4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0