REPORT

2024 Annual Groundwater Monitoring and Corrective Action Report

SCL4A – Utility Waste Landfill Cell 4A, 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 SCL4A 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) Cell 4A (SCL4A) at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCL4A 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 SCL4A 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. In 2024, SSIs were determined for the November 2023 and May 2024 sampling events and a summary of the SSIs for the past year is provided in **Table 1**.

Table 1 - Summary of 2024 SCL4A 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	**Chloride:** TMW-2, TMW-3	March 26, 2024	June 24, 2024
	Verification Sampling, February 7, 2024	February 23, 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	**Calcium:** TMW-1, TMW-2 **Chloride:** TMW-1, TMW-3	October 7, 2024	January 3, 2025
	Verification Sampling, July 29-30, 2024	August 13, 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.

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.

No new wells were installed or decommissioned in the SCL4A monitoring system in 2024.

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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 SCL4A. The groundwater monitoring system consists of six groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1** and wells are 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 SCL4A.

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCL4A 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-3	TMW-1	TMW-2	TMW-3	
	Date of Sample Collection						
February 2024 Verification Sampling	-	-	-	2/8/2024	2/7/2024	2/7/2024	Detection
May 2024 Sampling Event	5/28/2024	5/28/2024	5/28/2024	5/30/2024	5/29/2024	5/29/2024	Detection
July 2024 Verification Sampling	-	-	-	7/29/2024	7/30/2024	7/30/2024	Detection
November 2024 Sampling Event	11/20/2024	11/20/2024	11/14/2024	11/20/2024	11/19/2024	11/19/2024	Detection
Total Number of Samples Collected	2	2	2	4	4	4	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) TMW-1 was re-sampled in February 2024 following one initial exceedance 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 no longer contained any exceedances, and therefore, February 2024 verification sampling results at TMW-1 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 on February 7, 2024, and verified 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 through the November 2024 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 SCL4A.

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 is provided in **Appendix B**. This ASD demonstrates that the SSIs at monitoring wells TMW-2 & TMW-3 are not caused by the SCL4A CCR Unit, and therefore, the SCL4A 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 on July 29-30, 2024, and verified four 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**. The SSIs at TMW-1, TMW-2, and TMW-3 are not caused by the SCL4A 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. 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 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 have 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

No notable sampling issues were encountered at the SCL4A 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 semiannual 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.

An additional monitoring well is planned to be installed on the east side of SCL4A in 2025.

Tables

Table 3
November 2023 Detection Monitoring Results
SCL4A - Landfill Cell 4A
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1S	BMW-3S	Prediction Limit UG-3	UG-3	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
November 2023 Detection Monitoring Results											
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.678-7.373	7.04	6.531-7.438	7.11	6.71-7.226	6.96	6.573-7.424	7.01
BORON, TOTAL	µg/L	57.9 J	58.9 J	1,105	638	DQR	80.2 J	101.4	85.9 J	109	96.1 J
CALCIUM, TOTAL	µg/L	136,000	114,000	171,791	107,000	118,531	107,000	132,299	123,000	145,416	134,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	84.34	34.5	4.359	2.3	4.531	5.8	3.383	5.1
FLUORIDE, TOTAL	mg/L	ND	ND	0.39	ND	0.4613	ND	0.4211	ND	0.37	ND
SULFATE, TOTAL	mg/L	46.9	12.3	136.3	65.0	62.35	54.8	86.88	28.8	65.78	40.9
TOTAL DISSOLVED SOLIDS	mg/L	475	398	661.4	504	452.6	368	518	430	493	475
February 2024 Verification Sampling Event											
DATE	NA								2/7/2024		2/7/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L								9.1		9.1
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. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
7. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
8. 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: GTM
Checked By: ANT
Reviewed By: MNH

Table 4
May 2024 Detection Monitoring Results
SCL4A - Landfill Cell 4A
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1S	BMW-3S	Prediction Limit UG-3	UG-3	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
May 2024 Detection Monitoring Results											
DATE	NA	5/28/2024	5/28/2024	NA	5/28/2024	NA	5/30/2024	NA	5/29/2024	NA	5/29/2024
pH	SU	6.86	6.95	6.678-7.373	7.00	6.531-7.438	7.16	6.71-7.226	7.08	6.573-7.424	6.97
BORON, TOTAL	µg/L	58.1 J	54.1 J	1,105	345	DQR	85.5 J	101.4	84.0 J	109	56.8 J
CALCIUM, TOTAL	µg/L	133,000	116,000	171,791	129,000	118,531	124,000 J	132,299	135,000	145,416	113,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	84.34	28.0	4.359	12.8 J	4.531	4.0	3.383	14.2
FLUORIDE, TOTAL	mg/L	ND	ND	0.39	ND	0.4613	ND	0.4211	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	19.7	136.3	81.8	62.35	57.6 J	86.88	34.0 J	65.78	42.4
TOTAL DISSOLVED SOLIDS	mg/L	470	529	661.4	517	452.6	465	518	453	493	433
July 2024 Verification Sampling Event											
DATE	NA						7/29/2024		7/30/2024		7/30/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L						125,000 J		134,000		
CHLORIDE, TOTAL	mg/L						9.0 J				19.1
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L						440				

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. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
9. 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: JTA
Reviewed By: MNH

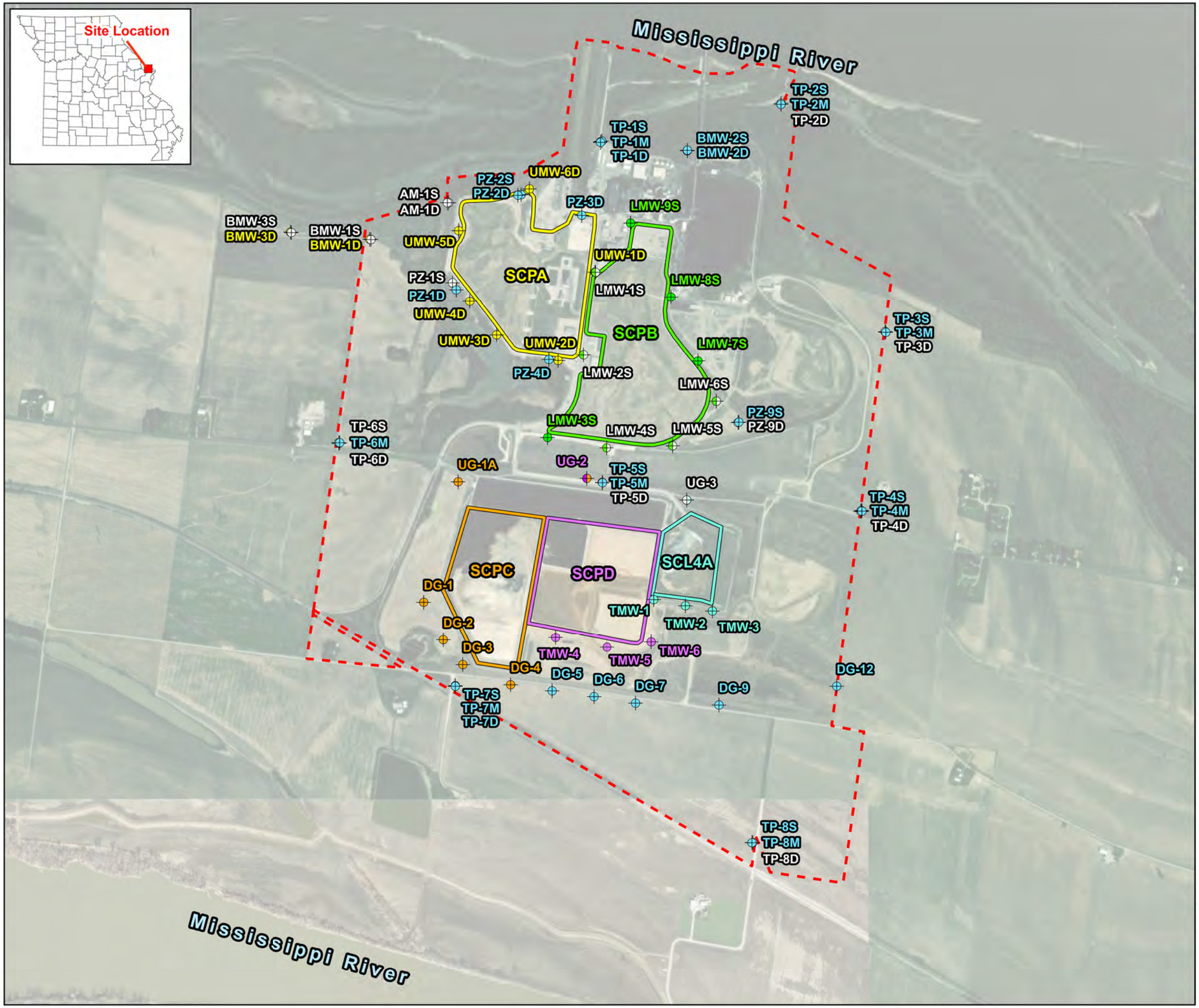
Table 5
November 2024 Detection Monitoring Results
SCL4A - Landfill Cell 4A
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
November 2024 Detection Monitoring Event							
DATE	NA	11/20/2024	11/20/2024	11/14/2024	11/20/2024	11/19/2024	11/19/2024
pH	SU	6.57	6.72	6.94	7.16	6.81	6.75
BORON, TOTAL	µg/L	61.9 J	57.3 J	418	83.6 J	87.2 J	93.4 J
CALCIUM, TOTAL	µg/L	175,000	113,000	120,000	118,000	134,000	128,000
CHLORIDE, TOTAL	mg/L	14.2	13.1	19.7 J	3.8	5.8	18.7
FLUORIDE, TOTAL	mg/L	ND	ND	0.47 J	0.37	0.33	0.32 J
SULFATE, TOTAL	mg/L	37.1	17.1	79.1 J	63.3	27.7	43.7
TOTAL DISSOLVED SOLIDS	mg/L	613	413	497	460	462	467

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 23, 2024

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

RE: Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

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
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CERTIFICATIONS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

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 SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60446913001	**S-TMW-1**	Water	02/08/24 04:57	02/09/24 05:30
60446913002	**S-TMW-2**	Water	02/07/24 13:45	02/09/24 05:30
60446913003	**S-TMW-3**	Water	02/07/24 12:38	02/09/24 05:30
60446913004	**S-SCL4A-DUP-1**	Water	02/08/24 00:00	02/09/24 05:30
60446913005	**S-SCL4A-FB-1**	Water	02/07/24 12:45	02/09/24 05:30

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60446913001	**S-TMW-1**	EPA 300.0	PL, RKA	2	PASI-K
60446913002	**S-TMW-2**	EPA 300.0	PL, RKA	2	PASI-K
60446913003	**S-TMW-3**	EPA 300.0	PL, RKA	2	PASI-K
60446913004	**S-SCL4A-DUP-1**	EPA 300.0	PL, RKA	2	PASI-K
60446913005	**S-SCL4A-FB-1**	EPA 300.0	RKA	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 SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Sample: S-TMW-1 **Lab ID: 60446913001** Collected: 02/08/24 04:57 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
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		02/21/24 12:50	16887-00-6	
Sulfate	**70.0**	mg/L	10.0	5.5	10		02/22/24 15:58	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Sample: S-TMW-2 **Lab ID: 60446913002** Collected: 02/07/24 13:45 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**9.1**	mg/L	1.0	0.53	1		02/21/24 13:02	16887-00-6	
Sulfate	**37.5**	mg/L	10.0	5.5	10		02/22/24 17:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Sample: S-TMW-3 **Lab ID: 60446913003** Collected: 02/07/24 12:38 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**9.1**	mg/L	1.0	0.53	1		02/21/24 13:52	16887-00-6	
Sulfate	**37.7**	mg/L	5.0	2.8	5		02/22/24 18:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Sample: S-SCL4A-DUP-1 **Lab ID: 60446913004** Collected: 02/08/24 00:00 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.6**	mg/L	1.0	0.53	1		02/21/24 14:42	16887-00-6	
Sulfate	**69.8**	mg/L	10.0	5.5	10		02/22/24 18:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Sample: S-SCL4A-FB-1 **Lab ID: 60446913005** Collected: 02/07/24 12:45 Received: 02/09/24 05:30 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
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		02/21/24 14:54	16887-00-6	
Sulfate	**0.72J**	mg/L	1.0	0.55	1		02/21/24 14:54	14808-79-8	

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

QUALITY CONTROL DATA

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

QC Batch: 883836
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: 60446913001, 60446913002, 60446913003, 60446913004, 60446913005

METHOD BLANK: 3498689 Matrix: Water
Associated Lab Samples: 60446913001, 60446913002, 60446913003, 60446913004, 60446913005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	02/21/24 12:01	
Sulfate	mg/L	<0.55	1.0	0.55	02/21/24 12:01	

LABORATORY CONTROL SAMPLE: 3498690

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3498691 3498692

Parameter	Units	60446913002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	9.1	50	50	58.1	57.3	98	96	80-120	1	15	
Sulfate	mg/L	37.5	50	50	87.7	86.8	100	99	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3498694 3498695

Parameter	Units	60446916001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	44.3	50	50	90.1	89.3	92	90	80-120	1	15	
Sulfate	mg/L	72.6	50	50	123	122	100	98	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3498697 3498698

Parameter	Units	60446940001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	<5.3	50	50	52.6	52.7	96	96	80-120	0	15	
Sulfate	mg/L	72.8	50	50	122	121	98	97	80-120	1	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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QUALITY CONTROL DATA

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

SAMPLE DUPLICATE: 3498693

Parameter	Units	60446913002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	9.1	9.1	0	15	
Sulfate	mg/L	37.5	39.0	4	15	

SAMPLE DUPLICATE: 3498696

Parameter	Units	60446916001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	44.3	43.0	3	15	
Sulfate	mg/L	72.6	69.8	4	15	

SAMPLE DUPLICATE: 3498699

Parameter	Units	60446940001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	<5.3	<5.3		15	
Sulfate	mg/L	72.8	70.9	3	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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QUALIFIERS

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCL4A-VERIFICATION SAMP
Pace Project No.: 60446913

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60446913001	**S-TMW-1**	EPA 300.0	883836		
60446913002	**S-TMW-2**	EPA 300.0	883836		
60446913003	**S-TMW-3**	EPA 300.0	883836		
60446913004	**S-SCL4A-DUP-1**	EPA 300.0	883836		
60446913005	**S-SCL4A-FB-1**	EPA 300.0	883836		

WO# : 60446913

60446913

Pace ANALYTICAL SERVICES	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: 2/9/24

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: _____

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 #4
Project Name:	Ameren SCL4A - Verification Sampling
Project Number:	COC#4

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	Sulfate	Chloride	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N		6044 6913
1	S-TMW-1	WT	G			2-8-24	0957		1	1									✓	✓		
2	S-TMW-2	WT	G			2-7-24	1345		1	1									✓	✓		
3	S-TMW-3	WT	G			2-7-24	1238		1	1									✓	✓		
4	S-SCL4A-DUP-1	WT	G			2-8-24	—		1	1									✓	✓		
5	S-SCL4A-FB-1	WT	G			2-7-24	1245		1	1									✓	✓		
6	S-SCL4A-MS-1	WT	G			2-7-24	1345		1	1									✓	✓		Collected @ S-TMW-2
7	S-SCL4A-MSD-1	WT	G			2-7-24	1345		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			
	Grant Morey/Rocksmith	2-8-24	1340		2/9	0520	0.9	✓	✓	✓
							1-2	✓	✓	✓

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Grant Morey		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	Grant Morey	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 Geoeng

Profile # 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	RP1U	BP2U	BP3U	BP1N	BP3N	BP3F	BP3S	BP3C	BP3Z	WPDU	ZPLC	Other		
1	WT																				1											
2	↓																				3											
3																					1											
4																					1											
5																					1											
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 60446913

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 – SCL4A Verification – Data Package 60446913**		

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 SCL4A Verification
Project Number: 23009
Reviewer: G. Morey
Validation Date: 3/19/2024

Laboratory: Pace Analytical
SDG #: 60446913
Analytical Method (type and no.): EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-SCL4A-DUP-1, S-SCL4A-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 - 2/8/2024
b) Sampling team indicated?	x			GTM/ANT
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)?	☒	☐	☐	See notes
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-SCL4A-DUP-1 @ S-TMW-1
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
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?	☒	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☒	☐	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☒	☐	☐	

Comments/Notes:

General:

Sulfate diluted for several samples, no qualification necessary.

Field blank:

S-SCL4A-FB-1 @ S-TMW-3: sulfate (0.72J). Result > RL and 10x blank, no qualification necessary.

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
9608 Loiret Blvd.
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 SCL4A
Pace Project No.: 60453818

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.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: AMEREN SCL4A
Pace Project No.: 60453818

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 SCL4A
Pace Project No.: 60453818

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60453818001	**S-TMW-2**	Water	05/29/24 12:13	05/30/24 05:35
60453818002	**S-TMW-3**	Water	05/29/24 14:04	05/30/24 05:35
60453818003	**S-SCL4A-DUP-1**	Water	05/29/24 00:00	05/30/24 05:35
60453818004	**S-SCL4A-FB-1**	Water	05/29/24 14:10	05/30/24 05:35
60453818005	**S-TMW-1**	Water	05/30/24 09:30	06/01/24 07:05
60453812011	**S-UG-3**	Water	05/28/24 15:44	05/30/24 05:35
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

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: AMEREN SCL4A
Pace Project No.: 60453818

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60453818001	**S-TMW-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
60453818002	**S-TMW-3**	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
60453818003	**S-SCL4A-DUP-1**	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
60453818004	**S-SCL4A-FB-1**	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
60453818005	**S-TMW-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
60453812011	**S-UG-3**	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
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
		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 SCL4A
Pace Project No.: 60453818

Sample: S-TMW-2 **Lab ID: 60453818001** Collected: 05/29/24 12:13 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	**84.0J**	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:55	7440-42-8	
Calcium	**135000**	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:55	7440-70-2	
Iron	**1730**	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:55	7439-89-6	
Magnesium	**23900**	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:55	7439-95-4	
Manganese	**538**	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:55	7439-96-5	
Potassium	**5230**	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:55	7440-09-7	
Sodium	**3880**	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:55	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		06/06/24 17:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**453**	mg/L	10.0	10.0	1		06/04/24 12:48		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.0**	mg/L	1.0	0.53	1		06/13/24 05:48	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/24 05:48	16984-48-8	N2
Sulfate	**34.0**	mg/L	10.0	5.5	10		06/13/24 06:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

Sample: S-TMW-3 **Lab ID: 60453818002** Collected: 05/29/24 14:04 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	**56.8J**	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:01	7440-42-8	
Calcium	**113000**	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:01	7440-70-2	
Iron	**32.7J**	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:01	7439-89-6	
Magnesium	**20600**	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:01	7439-95-4	
Manganese	**142**	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:01	7439-96-5	
Potassium	**677**	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:01	7440-09-7	B
Sodium	**6610**	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:01	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**390**	mg/L	20.0	10.5	1		06/07/24 13:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**433**	mg/L	10.0	10.0	1		06/04/24 12:49		
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		06/13/24 06:23	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/24 06:23	16984-48-8	N2
Sulfate	**42.4**	mg/L	10.0	5.5	10		06/13/24 06:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

Sample: S-SCL4A-DUP-1 **Lab ID: 60453818003** Collected: 05/29/24 00:00 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	**85.4J**	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:03	7440-42-8	
Calcium	**132000**	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:03	7440-70-2	
Iron	**1700**	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:03	7439-89-6	
Magnesium	**24000**	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:03	7439-95-4	
Manganese	**544**	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:03	7439-96-5	
Potassium	**5250**	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:03	7440-09-7	
Sodium	**4070**	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:03	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**432**	mg/L	20.0	10.5	1		06/07/24 13:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**452**	mg/L	10.0	10.0	1		06/04/24 12:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.0**	mg/L	1.0	0.53	1		06/12/24 16:04	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/12/24 16:04	16984-48-8	N2
Sulfate	**27.7**	mg/L	10.0	5.5	10		06/12/24 16:19	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

Sample: S-SCL4A-FB-1 **Lab ID: 60453818004** Collected: 05/29/24 14:10 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	**<6.4**	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:05	7440-42-8	
Calcium	**<26.9**	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:05	7440-70-2	
Iron	**<9.1**	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:05	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:05	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:05	7439-96-5	
Potassium	**102J**	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:05	7440-09-7	B
Sodium	**237J**	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:05	7440-23-5	B
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		06/07/24 13:55		
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		06/04/24 12:49		
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		06/12/24 16:34	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/12/24 16:34	16984-48-8	N2
Sulfate	**<0.55**	mg/L	1.0	0.55	1		06/12/24 16:34	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

Sample: S-TMW-1 **Lab ID: 60453818005** Collected: 05/30/24 09:30 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	**85.5J**	ug/L	100	6.4	1	06/07/24 09:46	06/12/24 11:09	7440-42-8	
Calcium	**124000**	ug/L	200	26.9	1	06/07/24 09:46	06/12/24 11:09	7440-70-2	M1,P6
Iron	**20.0J**	ug/L	50.0	9.1	1	06/07/24 09:46	06/12/24 11:09	7439-89-6	
Magnesium	**23700**	ug/L	50.0	20.1	1	06/07/24 09:46	06/12/24 11:09	7439-95-4	
Manganese	**665**	ug/L	5.0	0.39	1	06/07/24 09:46	06/12/24 11:09	7439-96-5	
Potassium	**4670**	ug/L	500	69.7	1	06/07/24 09:46	06/12/24 11:09	7440-09-7	
Sodium	**4410**	ug/L	500	115	1	06/07/24 09:46	06/12/24 11:09	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**354**	mg/L	20.0	10.5	1		06/07/24 13:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**465**	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	**12.8**	mg/L	1.0	0.53	1		06/15/24 14:32	16887-00-6	D6,M1,R1
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/15/24 14:32	16984-48-8	M1,N2
Sulfate	**57.6**	mg/L	10.0	5.5	10		06/15/24 15:28	14808-79-8	D6,M1,R1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

Sample: S-UG-3 **Lab ID: 60453812011** Collected: 05/28/24 15:44 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	**345**	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:36	7440-42-8	
Calcium	**129000**	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:36	7440-70-2	
Iron	**12.3J**	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:36	7439-89-6	
Magnesium	**24600**	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:36	7439-95-4	
Manganese	**276**	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:36	7439-96-5	
Potassium	**4950**	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:36	7440-09-7	
Sodium	**35500**	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:36	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**391**	mg/L	20.0	10.5	1		06/06/24 13:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**517**	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	**28.0**	mg/L	10.0	5.3	10		06/13/24 02:19	16887-00-6	
Fluoride	**<0.12**	mg/L	0.20	0.12	1		06/13/24 02:02	16984-48-8	N2
Sulfate	**81.8**	mg/L	10.0	5.5	10		06/13/24 02:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

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	

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60453818

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 SCL4A
Pace Project No.: 60453818

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, 60453812011, 60453818001

METHOD BLANK: 3549596 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453812011, 60453818001

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

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

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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 SCL4A
Pace Project No.: 60453818

QC Batch: 896850
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: 60453818002, 60453818003, 60453818004

METHOD BLANK: 3549612 Matrix: Water
Associated Lab Samples: 60453818002, 60453818003, 60453818004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/07/24 15:57	
Calcium	ug/L	<26.9	200	26.9	06/07/24 15:57	
Iron	ug/L	<9.1	50.0	9.1	06/07/24 15:57	
Magnesium	ug/L	<20.1	50.0	20.1	06/07/24 15:57	
Manganese	ug/L	<0.39	5.0	0.39	06/07/24 15:57	
Potassium	ug/L	99.7J	500	69.7	06/07/24 15:57	
Sodium	ug/L	287J	500	115	06/07/24 15:57	

LABORATORY CONTROL SAMPLE: 3549613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	946	95	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Iron	ug/L	10000	10400	104	85-115	
Magnesium	ug/L	10000	9990	100	85-115	
Manganese	ug/L	1000	1040	104	85-115	
Potassium	ug/L	10000	9990	100	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3549614 3549615

Parameter	Units	60453819001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	74.9J	1000	1000	1040	1060	97	99	70-130	2	20	
Calcium	ug/L	96800	10000	10000	104000	108000	69	115	70-130	4	20	M1
Iron	ug/L	<9.1	10000	10000	10300	10600	103	106	70-130	3	20	
Magnesium	ug/L	22000	10000	10000	31400	32600	94	106	70-130	4	20	
Manganese	ug/L	425	1000	1000	1470	1470	104	104	70-130	0	20	
Potassium	ug/L	4930	10000	10000	15100	15400	101	105	70-130	2	20	
Sodium	ug/L	3830	10000	10000	13800	14200	100	103	70-130	2	20	

MATRIX SPIKE SAMPLE: 3549616

Parameter	Units	60453862001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	317	1000	1280	96	70-130	
Calcium	ug/L	111000	10000	117000	62	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

MATRIX SPIKE SAMPLE: 3549616

Parameter	Units	60453862001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	295	10000	10900	106	70-130	
Magnesium	ug/L	61300	10000	69500	81	70-130	
Manganese	ug/L	15.7	1000	1050	104	70-130	
Potassium	ug/L	15300	10000	24900	97	70-130	
Sodium	ug/L	254000	10000	256000	21	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 897107
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: 60453818005

METHOD BLANK: 3550877 Matrix: Water
Associated Lab Samples: 60453818005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	06/12/24 11:05	
Calcium	ug/L	31.3J	200	26.9	06/12/24 11:05	
Iron	ug/L	<9.1	50.0	9.1	06/12/24 11:05	
Magnesium	ug/L	<20.1	50.0	20.1	06/12/24 11:05	
Manganese	ug/L	<0.39	5.0	0.39	06/12/24 11:05	
Potassium	ug/L	<69.7	500	69.7	06/12/24 11:05	
Sodium	ug/L	<115	500	115	06/12/24 11:05	

LABORATORY CONTROL SAMPLE: 3550878

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	964	96	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	1040	104	85-115	
Potassium	ug/L	10000	9950	99	85-115	
Sodium	ug/L	10000	10200	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3550879 3550880

Parameter	Units	60453818005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	85.5J	1000	1000	1050	1060	96	97	70-130	1	20	
Calcium	ug/L	124000	10000	10000	130000	130000	62	59	70-130	0	20	M1
Iron	ug/L	20.0J	10000	10000	10200	10100	102	101	70-130	1	20	
Magnesium	ug/L	23700	10000	10000	33000	32900	93	92	70-130	0	20	
Manganese	ug/L	665	1000	1000	1660	1670	100	100	70-130	0	20	
Potassium	ug/L	4670	10000	10000	14600	14700	99	100	70-130	1	20	
Sodium	ug/L	4410	10000	10000	14500	14400	101	100	70-130	0	20	

MATRIX SPIKE SAMPLE: 3550881

Parameter	Units	60454095001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	322	1000	1340	102	70-130	
Calcium	ug/L	53900	10000	69500	155	70-130	P6

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

MATRIX SPIKE SAMPLE: 3550881

Parameter	Units	60454095001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	18.1J	10000	10300	103	70-130	
Magnesium	ug/L	14900	10000	26300	114	70-130	
Manganese	ug/L	21.9	1000	1060	104	70-130	
Potassium	ug/L	9750	10000	21100	113	70-130	
Sodium	ug/L	113000	10000	135000	220	70-130	P6

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 896830
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453812011

METHOD BLANK: 3549482 Matrix: Water
Associated Lab Samples: 60453812011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	06/06/24 12:54	

LABORATORY CONTROL SAMPLE: 3549483

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	512	102	90-110	

SAMPLE DUPLICATE: 3549484

Parameter	Units	60453812020 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	382	382	0	10	

SAMPLE DUPLICATE: 3549485

Parameter	Units	60453815004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	370	371	0	10	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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: 60453818001

METHOD BLANK: 3549490 Matrix: Water
Associated Lab Samples: 60453818001

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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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 897229 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453818002, 60453818003, 60453818004, 60453818005

METHOD BLANK: 3551348 Matrix: Water
Associated Lab Samples: 60453818002, 60453818003, 60453818004, 60453818005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	06/07/24 13:26	

LABORATORY CONTROL SAMPLE: 3551349

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	520	104	90-110	

SAMPLE DUPLICATE: 3551350

Parameter	Units	60453818005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	354	368	4	10	

SAMPLE DUPLICATE: 3551351

Parameter	Units	60453819001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	276	280	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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, 60453812011

METHOD BLANK: 3548054 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453812011

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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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 896439
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453818001, 60453818002, 60453818003, 60453818004

METHOD BLANK: 3548058 Matrix: Water
Associated Lab Samples: 60453818001, 60453818002, 60453818003, 60453818004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/04/24 12:47	

LABORATORY CONTROL SAMPLE: 3548059

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	973	97	80-120	

SAMPLE DUPLICATE: 3548060

Parameter	Units	60453775001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2820	2660	6	10	

SAMPLE DUPLICATE: 3548067

Parameter	Units	60453819001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	381	394	3	10	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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: 60453818005

METHOD BLANK: 3549433 Matrix: Water
Associated Lab Samples: 60453818005

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	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

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, 60453812011, 60453818001, 60453818002

METHOD BLANK: 3554025 Matrix: Water
Associated Lab Samples: 60453812001, 60453812002, 60453812011, 60453818001, 60453818002

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	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 897827
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: 60453818003, 60453818004

METHOD BLANK: 3554031 Matrix: Water
Associated Lab Samples: 60453818003, 60453818004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/11/24 08:59	
Fluoride	mg/L	<0.12	0.20	0.12	06/11/24 08:59	N2
Sulfate	mg/L	<0.55	1.0	0.55	06/11/24 08:59	

LABORATORY CONTROL SAMPLE: 3554032

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	2.7	107	90-110	N2
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3554033 3554034

Parameter	Units	60453819001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.1	5	5	11.4	11.1	186	180	80-120	3	15	M1
Fluoride	mg/L	0.16J	2.5	2.5	4.9	4.7	191	183	80-120	4	15	M1,N2
Sulfate	mg/L	73.9	50	50	196	172	244	196	80-120	13	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3554036 3554037

Parameter	Units	60453805003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	48.7	50	50	107	102	117	106	80-120	5	15	
Fluoride	mg/L	0.13J	2.5	2.5	3.0	2.9	113	111	80-120	2	15	N2
Sulfate	mg/L	73.1	50	50	129	127	113	108	80-120	2	15	

SAMPLE DUPLICATE: 3554035

Parameter	Units	60453819001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	2.1	2.1	0	15	
Fluoride	mg/L	0.16J	0.16J		15	N2
Sulfate	mg/L	73.9	73.6	0	15	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

SAMPLE DUPLICATE: 3554038

Parameter	Units	60453805003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	48.7	49.5	1	15	
Fluoride	mg/L	0.13J	0.14J		15	N2
Sulfate	mg/L	73.1	73.4	0	15	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60453818

QC Batch: 898112
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: 60453818005

METHOD BLANK: 3555148 Matrix: Water
Associated Lab Samples: 60453818005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	06/17/24 08:57	
Fluoride	mg/L	<0.12	0.20	0.12	06/17/24 08:57	N2
Sulfate	mg/L	<0.55	1.0	0.55	06/17/24 08:57	

LABORATORY CONTROL SAMPLE: 3555149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.7	110	90-110	N2
Sulfate	mg/L	5	4.6	92	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3555151 3555152

Parameter	Units	60453812020 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	8.6	5	5	13.9	14.5	106	118	80-120	4	15	
Fluoride	mg/L	<0.12	2.5	2.5	2.5	2.6	101	105	80-120	4	15	N2
Sulfate	mg/L	73.5	100	100	193	219	119	145	80-120	13	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3555153 3555154

Parameter	Units	60453818005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	12.8	5	5	12.7	19.1	-2	127	80-120	41	15	M1,R1
Fluoride	mg/L	<0.12	2.5	2.5	<0.12	3.2	1	127	80-120		15	M1,N2
Sulfate	mg/L	57.6	50	50	55.6	121	-4	128	80-120	74	15	M1,R1

SAMPLE DUPLICATE: 3555150

Parameter	Units	60453812020 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	8.6	8.3	4	15	
Fluoride	mg/L	<0.12	<0.12		15	N2
Sulfate	mg/L	73.5	87.6	17	15	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 SCL4A
Pace Project No.: 60453818

SAMPLE DUPLICATE: 3555155

Parameter	Units	60453818005 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	12.8	17.8	32	15	D6
Fluoride	mg/L	<0.12	2.5		15	N2
Sulfate	mg/L	57.6	111	63	15	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 SCL4A
Pace Project No.: 60453818

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

B	Analyte was detected in the associated method blank.
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.
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 SCL4A
Pace Project No.: 60453818

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
60453812011	**S-UG-3**	EPA 200.7	896847	EPA 200.7	897011
60453818001	**S-TMW-2**	EPA 200.7	896847	EPA 200.7	897011
60453818002	**S-TMW-3**	EPA 200.7	896850	EPA 200.7	896993
60453818003	**S-SCL4A-DUP-1**	EPA 200.7	896850	EPA 200.7	896993
60453818004	**S-SCL4A-FB-1**	EPA 200.7	896850	EPA 200.7	896993
60453818005	**S-TMW-1**	EPA 200.7	897107	EPA 200.7	897349
60453812001	**S-BMW-1S**	SM 2320B	896743		
60453812002	**S-BMW-3S**	SM 2320B	896743		
60453812011	**S-UG-3**	SM 2320B	896830		
60453818001	**S-TMW-2**	SM 2320B	896832		
60453818002	**S-TMW-3**	SM 2320B	897229		
60453818003	**S-SCL4A-DUP-1**	SM 2320B	897229		
60453818004	**S-SCL4A-FB-1**	SM 2320B	897229		
60453818005	**S-TMW-1**	SM 2320B	897229		
60453812001	**S-BMW-1S**	SM 2540C	896436		
60453812002	**S-BMW-3S**	SM 2540C	896436		
60453812011	**S-UG-3**	SM 2540C	896436		
60453818001	**S-TMW-2**	SM 2540C	896439		
60453818002	**S-TMW-3**	SM 2540C	896439		
60453818003	**S-SCL4A-DUP-1**	SM 2540C	896439		
60453818004	**S-SCL4A-FB-1**	SM 2540C	896439		
60453818005	**S-TMW-1**	SM 2540C	896817		
60453812001	**S-BMW-1S**	EPA 300.0	897826		
60453812002	**S-BMW-3S**	EPA 300.0	897826		
60453812011	**S-UG-3**	EPA 300.0	897826		
60453818001	**S-TMW-2**	EPA 300.0	897826		
60453818002	**S-TMW-3**	EPA 300.0	897826		
60453818003	**S-SCL4A-DUP-1**	EPA 300.0	897827		
60453818004	**S-SCL4A-FB-1**	EPA 300.0	897827		
60453818005	**S-TMW-1**	EPA 300.0	898112		

WO# : 60453818

60453818

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** 2.1 **Corr. Factor** 0.0 **Corrected** 2.1

Date and initials of person examining contents: PVS 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#:** 67181	☑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

60453818

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# 11	Invoice To:	Mark Haddock
Project Name:	AMEREN SCL4A	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 3087030

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	Chloride/Fluoride/Sulfate	TDS / Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment	Preservation non-conformance identified for sample.
S-TMW-1	WT													
S-TMW-2	WT				5-29-24	1213								
S-TMW-3	WT				"	1404								
S-SCL4A-DUP-1	WT				"	-								
S-SCL4A-FB-1	WT				"	1410								
S-SCL4A-MS-1	WT													
S-SCL4A-MSD-1	WT													
S-BMW-1S	WT	G			5-28-24	1135	2			✓	✓	✓		
S-BMW-3S	WT	G			"	1420	2			✓	✓	✓		
S-UG-3	WT	G			5-28-24	1514	2			✓	✓	✓		

Additional Instructions from Pace®:
*** - App III and Cat/An Metals* - EPA 200.7: B, 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	T299	0.0	2.1	2.1	

	Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
1	Rocksmith	5-29-24 / 1600		5/30/24 0535
2				
3				
4				

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, S-BMW-3S and S-UG-3.

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	WT																		1				1		log all tests on COC					
3	↓																		1				1				↓			
4																			1				1							
5																			1				1							
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: 60053818

WO#: 60453818

60453818

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** 1.3/1.7 **Corr. Factor** 0.0 **Corrected** 1.3/1.7

Temperature should be above freezing to 6°C

Date and initials of person examining contents: AN 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)	☐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

60453818

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# 11		
Project Name:	AMEREN SCL4A	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

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	Chloride/Fluoride/Sulfate	TDS / Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment
S-TMW-1	WT	G			5-30-24	0930	2			✓	✓	✓	
S-TMW-2	WT												
S-TMW-3	WT												
S-SCL4A-DUP-1	WT												
S-SCL4A-FB-1	WT												
S-SCL4A-MS-1	WT	G			5-30-24	0930	2			✓	✓	✓	Collected @ S-TMW-1
S-SCL4A-MSD-1	WT	G			1	0930	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 3087030

Preservation non-conformance identified for sample.

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: B, 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:
2	T299	0.0	1.3/1.7		

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
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 #

Site:

Notes Append to 60453818

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																		3				3									
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: 60453818

Memorandum

August 5, 2024

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 – SCL4A – Data Package 60453818**		

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 duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- 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). 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 SCL4A
Project Number: 23009-24
Reviewer: G. Morey
Validation Date: 8/5/2024

Laboratory: Pace Analytical
SDG #: 60453818
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-TMW-2, S-TMW-3, S-SCL4A-DUP-1, S-SCL4A-FB-1, S-TMW-1, S-UG-3, 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			5/28/2024 - 5/30/2024
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)?				S-SCL4A-DUP-1 @ S-TMW-2
	x			See Notes
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		

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	x	See Notes

Comments/Notes:

General:

Chloride and sulfate diluted in some samples, no qualification necessary.

Method Blanks:

3549612: potassium (99.7J) and sodium (287J). Associated with samples -002 through -004. Potassium at -002 > RL and < 10x blank, result qualified as estimate. Results at -004 < RL, results qualified as ND at RL. Other results > RL and > 10x blank, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks, continued:

3550877: calcium (31.3 J). Associated with sample -005. Result > RL and > 10x blank, no qualification necessary.

Field Blanks:

S-SCL4A-FB-1 @ S-TMW-3: potassium (102J) and sodium (287J). Potassium > RL and < 10x blank, result qualified as estimate. Sodium > RL and 10x blank, no qualification necessary.

Duplicates:

S-SCL4A-DUP-1 @ S-TMW-2: field duplicate RPD exceeds control limit (20%) for sulfate (20.4%), results qualified as estimates.

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

3548056: Lab duplicate exceeds max RPD for TDS, associated with unrelated sample, no qualification necessary.

3555150: Lab duplicate exceeds max RPD for sulfate, associated with unrelated sample, no qualification necessary.

3555155: Lab duplicate exceeds max RPD for chloride and sulfate, associated with sample -005, results qualified as estimates.

MS/MSD:

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

3549614/3549615: MS recovery low for calcium, MSD recovery and RPD within control limits, associated with unrelated sample, no qualification necessary.

3549616: MS recoveries low for calcium and sodium, associated with unrelated sample, no qualification necessary.

3550879/3550880: MS/MSD recoveries low for calcium, RPD within control limits, associated with sample -005, result qualified as estimate.

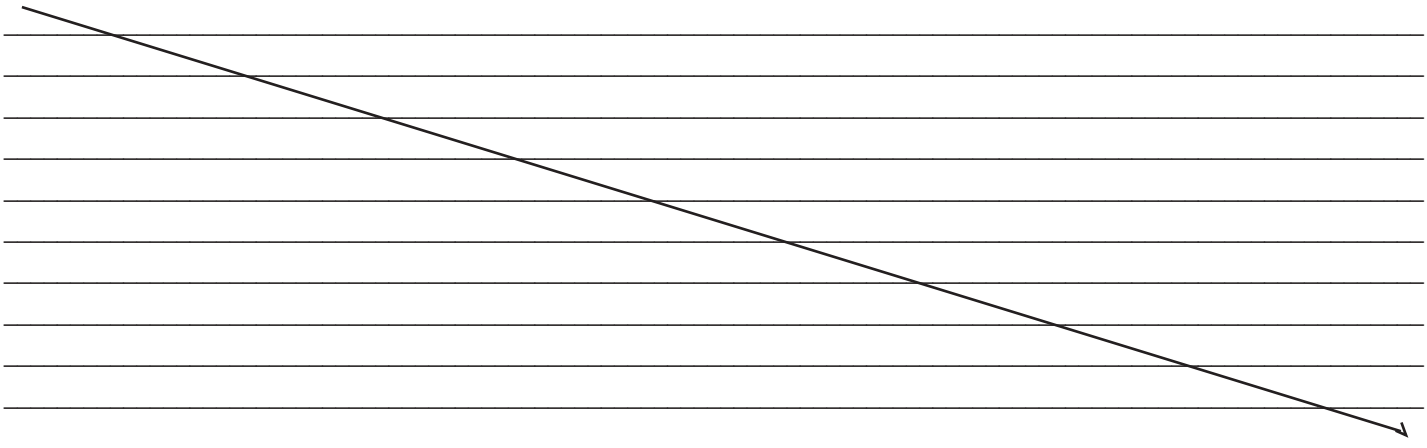
3550881: MS recovery high for calcium and sodium, associated with unrelated sample, no qualification necessary.

3554027/3554028: MS/MSD recoveries high for chloride, fluoride, and sulfate, RPDs within control limits, associated with unrelated sample, no qualification necessary.

3554033/3554034: MS/MSD recoveries high for chloride, fluoride, and sulfate, RPDs within control limits, associated with unrelated sample, no qualification necessary.

3555151/3555152: MSD recovery high for sulfate, MS recovery and RPD within control limits, associated with unrelated sample, no qualification necessary.

3555153/3555154: MS recovery low (<10%), MSD recovery high, and RPD outside of control limits for chloride, fluoride, and sulfate. Associated with sample -005. Chloride and sulfate results qualified as estimates. Flouride result is a ND and therefore rejected.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-TMW-3	Potassium	677	J	Detected in method and field blank, result > RL and < 10x blank
S-SCL4A-FB-1	Potassium	500	U	Detected in method blank, result < RL
"	Sodium	500	U	"
S-TMW-2	Sulfate	34	J	Field DUP RPD exceeds control limits
S-SCL4A-DUP-1	"	27.7	J	"
S-TMW-1	Chloride	12.8	J	Lab DUP RPD exceeds control limits
"	Sulfate	57.6	J	"
"	Calcium	124000	J-	MS/MSD recoveries low, RPD OK
"	Chloride	12.8	J	MS recovery low, MSD recovery high, RPD exceeds control limit
"	Sulfate	57.6	J	"
"	Fluoride	0.12	R	MS recovery <10%, result is a non detect

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: Grant Morey Date: 08/05/2024

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

August 13, 2024

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

RE: Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

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.

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

CERTIFICATIONS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

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 SCL4A - VERIFICATION
Pace Project No.: 60457662

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60457662001	**S-TMW-1**	Water	07/29/24 11:20	07/31/24 07:07
60457662002	**S-TMW-2**	Water	07/30/24 10:36	07/31/24 07:07
60457662003	**S-TMW-3**	Water	07/30/24 09:33	07/31/24 07:07
60457662004	**S-SCL4A-DUP-1**	Water	07/30/24 00:00	07/31/24 07:07
60457662005	**S-SCL4A-FB-1**	Water	07/30/24 10:46	07/31/24 07:07

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SAMPLE ANALYTE COUNT

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60457662001	**S-TMW-1**	EPA 200.7	ARMN	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	1	PASI-K
60457662002	**S-TMW-2**	EPA 200.7	ARMN	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	1	PASI-K
60457662003	**S-TMW-3**	EPA 200.7	ARMN	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	1	PASI-K
60457662004	**S-SCL4A-DUP-1**	EPA 200.7	ARMN	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	1	PASI-K
60457662005	**S-SCL4A-FB-1**	EPA 200.7	ARMN	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Sample: S-TMW-1 **Lab ID: 60457662001** Collected: 07/29/24 11:20 Received: 07/31/24 07:07 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								
Calcium	**125000**	ug/L	200	26.9	1	07/31/24 15:20	08/12/24 18:17	7440-70-2	M1,P6
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**440**	mg/L	10.0	10.0	1		07/31/24 09:38		
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 00:53	16887-00-6	M1

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Sample: S-TMW-2 **Lab ID: 60457662002** Collected: 07/30/24 10:36 Received: 07/31/24 07:07 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								
Calcium	**134000**	ug/L	200	26.9	1	07/31/24 15:20	08/12/24 18:22	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**469**	mg/L	10.0	10.0	1		07/31/24 09:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.4**	mg/L	1.0	0.53	1		08/07/24 02:07	16887-00-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Sample: S-TMW-3 **Lab ID: 60457662003** Collected: 07/30/24 09:33 Received: 07/31/24 07:07 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								
Calcium	**131000**	ug/L	200	26.9	1	07/31/24 15:20	08/12/24 18:23	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**474**	mg/L	10.0	10.0	1		07/31/24 09:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**19.1**	mg/L	1.0	0.53	1		08/07/24 02:25	16887-00-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Sample: S-SCL4A-DUP-1 **Lab ID: 60457662004** 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
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**126000**	ug/L	200	26.9	1	07/31/24 15:20	08/12/24 18:25	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**470**	mg/L	10.0	10.0	1		07/31/24 09:39		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**18.9**	mg/L	1.0	0.53	1		08/07/24 02:43	16887-00-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Sample: S-SCL4A-FB-1 **Lab ID: 60457662005** Collected: 07/30/24 10:46 Received: 07/31/24 07:07 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								
Calcium	**<26.9**	ug/L	200	26.9	1	07/31/24 15:20	08/12/24 18:27	7440-70-2	
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		07/31/24 09:39		
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 03:02	16887-00-6	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

QC Batch: 903723
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: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

METHOD BLANK: 3576524 Matrix: Water
Associated Lab Samples: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	27.5J	200	26.9	08/12/24 18:13	

LABORATORY CONTROL SAMPLE: 3576525

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	10000	10800	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3576526 3576527

Parameter	Units	60457662001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	125000	10000	10000	126000	128000	13	37	70-130	2	20	M1

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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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

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: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

METHOD BLANK: 3576269 Matrix: Water
Associated Lab Samples: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

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

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

QUALITY CONTROL DATA

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

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: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

METHOD BLANK: 3578340 Matrix: Water
Associated Lab Samples: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

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

METHOD BLANK: 3580377 Matrix: Water
Associated Lab Samples: 60457662001, 60457662002, 60457662003, 60457662004, 60457662005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	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	

LABORATORY CONTROL SAMPLE: 3580378

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	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

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

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 SCL4A - VERIFICATION
Pace Project No.: 60457662

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

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

SAMPLE DUPLICATE: 3578344

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

SAMPLE DUPLICATE: 3578347

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

SAMPLE DUPLICATE: 3578350

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

SAMPLE DUPLICATE: 3578353

Parameter	Units	60457663003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	34.0	31.9	7	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 SCL4A - VERIFICATION
Pace Project No.: 60457662

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCL4A - VERIFICATION
Pace Project No.: 60457662

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60457662001	**S-TMW-1**	EPA 200.7	903723	EPA 200.7	903753
60457662002	**S-TMW-2**	EPA 200.7	903723	EPA 200.7	903753
60457662003	**S-TMW-3**	EPA 200.7	903723	EPA 200.7	903753
60457662004	**S-SCL4A-DUP-1**	EPA 200.7	903723	EPA 200.7	903753
60457662005	**S-SCL4A-FB-1**	EPA 200.7	903723	EPA 200.7	903753
60457662001	**S-TMW-1**	SM 2540C	903652		
60457662002	**S-TMW-2**	SM 2540C	903652		
60457662003	**S-TMW-3**	SM 2540C	903652		
60457662004	**S-SCL4A-DUP-1**	SM 2540C	903652		
60457662005	**S-SCL4A-FB-1**	SM 2540C	903652		
60457662001	**S-TMW-1**	EPA 300.0	904194		
60457662002	**S-TMW-2**	EPA 300.0	904194		
60457662003	**S-TMW-3**	EPA 300.0	904194		
60457662004	**S-SCL4A-DUP-1**	EPA 300.0	904194		
60457662005	**S-SCL4A-FB-1**	EPA 300.0	904194		

WO# : 60457662

60457662

Pace ANALYTICAL SERVICES	DC#_Title: ENV-FRM-LENE-0009_Sample Co		
	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#:** 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

Page 1 of 1

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 #3
Project Name:	Ameren SCL4A - Verification Sampling
Project Number:	COC#3

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

Valid Matrix Codes

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

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

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: Sulfate	Calcium	Chloride	Total Dissolved Solids									Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N	N	N	N	N	N		60457662
1	S-TMW-1	WT	G			7-29-24	1120		2	1		1						✓	✓	✓										
2	S-TMW-2	WT	G			7-30-24	1036		2	1		1						✓	✓	✓										
3	S-TMW-3	WT	G			7-30-24	0933		2	1		1						✓	✓	✓										
4	S-SCL4A-DUP-1	WT	G			7-30-24	—		2	1		1						✓	✓	✓										
5	S-SCL4A-FB-1	WT	G			7-30-24	1046		2	1		1						✓	✓	✓										
6	S-SCL4A-MS-1	WT	G			7-29-24	1120		2	1		1						✓	✓	✓										Collected @ S-TMW-1
7	S-SCL4A-MSD-1	WT	G			7-29-24	1120		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			
	John Rasmussen / Jeff / Rocksmith	7-30-24	12:43	[signature] BASE	7/31	0707	1-4	✓	✓	✓
							1-0	✓	✓	✓

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Grant Morey

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

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

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

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																			3			3		MS/MSD							
2	↓																			1			1									
3																				1			1									
4																				1			1									
5																				1			1									
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	
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: 60457662

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 – SCL4A – Data Package 60453818**		

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).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCL4A- Verification
Project Number: 23009-24
Reviewer: J. Rasmussen
Validation Date: 08/14/2024

Laboratory: Pace Analytical
SDG #: 60457662
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-SCL4A-DUP-1, S-SCL4A-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			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			
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			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-SCL4A-DUP-1 @ S-TMW-3
b) Were field dup. precision criteria met (note RPD)?	x			All RPD's within control limits
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			See Notes
d) Were lab dup. precision criteria met (note RPD)?		x		

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			

Comments/Notes:

Method Blanks:

3576524: calcium (27.5J), associated with samples -001 through -005. Samples -001 through -004 results > RL and 10x blank, no qualification necessary. Sample -005 result detected as non-detect, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Field Blank:

S-SCL4A-FB-1 @ S-TMW-2: TDS (5.0), result > RL and 10x blank, no qualification necessary.

Duplicate:

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

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

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

MS/MSD:

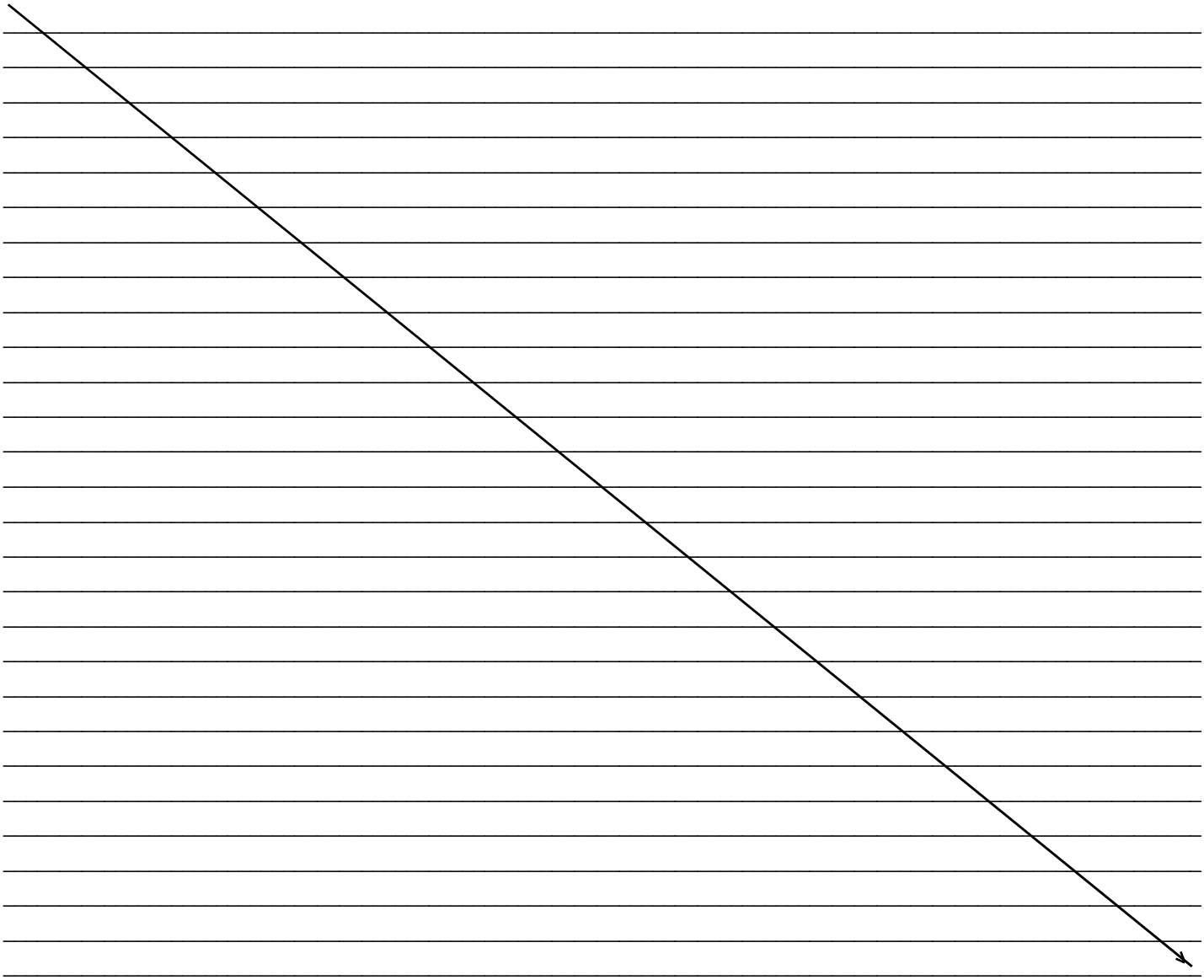
3576526/3576527: MS and MSD recovery low for calcium, RPD okay. Associated with sample -001, results qualified as estimates.

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. Associated with sample -001, results qualified as estimates.

3578351/3578352: MS and MSD recovery low for chloride, RPD okay. Associated with unrelated sample, no qualification necessary.



QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-TMW-1	Calcium	125000	J-	MS and MSD recovery low, RPD okay
S-TMW-1	Chloride	9.0	J-	"

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason

Signature: _____ Date: 08/14/2024

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

December 23, 2024

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

RE: Project: AMEREN SCL4A
Pace Project No.: 60465156

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

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: AMEREN SCL4A
Pace Project No.: 60465156

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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Lenexa, KS 66219
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SAMPLE SUMMARY

Project: AMEREN SCL4A
Pace Project No.: 60465156

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60465156001	**S-TMW-1**	Water	11/20/24 14:00	11/21/24 07:45
60465156002	**S-TMW-2**	Water	11/19/24 12:18	11/21/24 07:45
60465156003	**S-TMW-3**	Water	11/19/24 13:10	11/21/24 07:45
60465156004	**S-SCL4A-DUP-1**	Water	11/19/24 08:00	11/21/24 07:45
60465156005	**S-SCL4A-FB-1**	Water	11/19/24 13:02	11/21/24 07:45
60464699003	**S-UG-3**	Water	11/14/24 11:15	11/15/24 05:55
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 SCL4A
Pace Project No.: 60465156

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60465156001	**S-TMW-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
60465156002	**S-TMW-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
60465156003	**S-TMW-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
60465156004	**S-SCL4A-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
60465156005	**S-SCL4A-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
60464699003	**S-UG-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
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
		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 SCL4A
Pace Project No.: 60465156

Sample: S-TMW-1 **Lab ID: 60465156001** Collected: 11/20/24 14:00 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	**83.6J**	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:02	7440-42-8	
Calcium	**118000**	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:02	7440-70-2	
Iron	**13.6J**	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:02	7439-89-6	B
Magnesium	**19900**	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:02	7439-95-4	
Manganese	**331**	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:02	7439-96-5	
Potassium	**5120**	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:02	7440-09-7	
Sodium	**4000**	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:02	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**329**	mg/L	20.0	10.5	1		12/02/24 18:10		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**460**	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	**3.8**	mg/L	1.0	0.53	1		12/03/24 13:11	16887-00-6	
Fluoride	**0.37**	mg/L	0.20	0.12	1		12/03/24 13:11	16984-48-8	M1
Sulfate	**63.3**	mg/L	10.0	5.5	10		12/03/24 13:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

Sample: S-TMW-2 **Lab ID: 60465156002** Collected: 11/19/24 12:18 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	**87.2J**	ug/L	100	6.4	1	11/22/24 09:01	12/10/24 11:54	7440-42-8	
Calcium	**134000**	ug/L	200	26.9	1	11/22/24 09:01	12/10/24 11:54	7440-70-2	
Iron	**2310**	ug/L	50.0	9.1	1	11/22/24 09:01	12/10/24 11:54	7439-89-6	
Magnesium	**24000**	ug/L	50.0	20.1	1	11/22/24 09:01	12/10/24 11:54	7439-95-4	
Manganese	**462**	ug/L	5.0	0.39	1	11/22/24 09:01	12/10/24 11:54	7439-96-5	
Potassium	**5570**	ug/L	500	69.7	1	11/22/24 09:01	12/10/24 11:54	7440-09-7	
Sodium	**4080**	ug/L	500	115	1	11/22/24 09:01	12/10/24 11:54	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**391**	mg/L	20.0	10.5	1		12/02/24 15:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**462**	mg/L	10.0	10.0	1		11/26/24 15:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.8**	mg/L	1.0	0.53	1		12/03/24 16:24	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	0.12	1		12/03/24 16:24	16984-48-8	
Sulfate	**27.7**	mg/L	10.0	5.5	10		12/03/24 16:37	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

Sample: S-TMW-3 **Lab ID: 60465156003** Collected: 11/19/24 13:10 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	**93.4J**	ug/L	100	6.4	1	11/22/24 09:01	12/10/24 11:56	7440-42-8	
Calcium	**128000**	ug/L	200	26.9	1	11/22/24 09:01	12/10/24 11:56	7440-70-2	
Iron	**1830**	ug/L	50.0	9.1	1	11/22/24 09:01	12/10/24 11:56	7439-89-6	
Magnesium	**23200**	ug/L	50.0	20.1	1	11/22/24 09:01	12/10/24 11:56	7439-95-4	
Manganese	**667**	ug/L	5.0	0.39	1	11/22/24 09:01	12/10/24 11:56	7439-96-5	
Potassium	**6170**	ug/L	500	69.7	1	11/22/24 09:01	12/10/24 11:56	7440-09-7	
Sodium	**4790**	ug/L	500	115	1	11/22/24 09:01	12/10/24 11:56	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**353**	mg/L	20.0	10.5	1		12/02/24 15:09		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**467**	mg/L	10.0	10.0	1		11/26/24 15:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**18.7**	mg/L	1.0	0.53	1		12/03/24 16:50	16887-00-6	
Fluoride	**0.32**	mg/L	0.20	0.12	1		12/03/24 16:50	16984-48-8	
Sulfate	**43.7**	mg/L	10.0	5.5	10		12/03/24 17:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

Sample: S-SCL4A-DUP-1 **Lab ID: 60465156004** Collected: 11/19/24 08:00 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	**81.9J**	ug/L	100	6.4	1	11/22/24 09:01	12/10/24 11:57	7440-42-8	
Calcium	**127000**	ug/L	200	26.9	1	11/22/24 09:01	12/10/24 11:57	7440-70-2	
Iron	**2230**	ug/L	50.0	9.1	1	11/22/24 09:01	12/10/24 11:57	7439-89-6	
Magnesium	**22500**	ug/L	50.0	20.1	1	11/22/24 09:01	12/10/24 11:57	7439-95-4	
Manganese	**433**	ug/L	5.0	0.39	1	11/22/24 09:01	12/10/24 11:57	7439-96-5	
Potassium	**5170**	ug/L	500	69.7	1	11/22/24 09:01	12/10/24 11:57	7440-09-7	
Sodium	**3800**	ug/L	500	115	1	11/22/24 09:01	12/10/24 11:57	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**389**	mg/L	20.0	10.5	1		12/02/24 15:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**455**	mg/L	10.0	10.0	1		11/26/24 15:38		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.53	1		12/03/24 17:41	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	0.12	1		12/03/24 17:41	16984-48-8	
Sulfate	**27.7**	mg/L	10.0	5.5	10		12/03/24 17:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

Sample: S-SCL4A-FB-1 **Lab ID: 60465156005** Collected: 11/19/24 13:02 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	**<6.4**	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:10	7440-42-8	
Calcium	**36.3J**	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:10	7440-70-2	B
Iron	**<9.1**	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:10	7439-89-6	
Magnesium	**<20.1**	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:10	7439-95-4	
Manganese	**<0.39**	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:10	7439-96-5	
Potassium	**<69.7**	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:10	7440-09-7	
Sodium	**184J**	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:10	7440-23-5	B
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<10.5**	mg/L	20.0	10.5	1		12/02/24 15:21		
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		11/26/24 15:38		
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		12/03/24 18:06	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.12	1		12/03/24 18:06	16984-48-8	
Sulfate	**<0.55**	mg/L	1.0	0.55	1		12/03/24 18:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

Sample: S-UG-3 **Lab ID: 60464699003** Collected: 11/14/24 11:15 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	**418**	ug/L	100	6.4	1	11/15/24 15:15	11/20/24 12:56	7440-42-8	
Calcium	**120000**	ug/L	200	26.9	1	11/15/24 15:15	11/20/24 12:56	7440-70-2	
Iron	**14.9J**	ug/L	50.0	9.1	1	11/15/24 15:15	11/20/24 12:56	7439-89-6	B
Magnesium	**22100**	ug/L	50.0	20.1	1	11/15/24 15:15	11/20/24 12:56	7439-95-4	
Manganese	**894**	ug/L	5.0	0.39	1	11/15/24 15:15	11/20/24 12:56	7439-96-5	
Potassium	**4590**	ug/L	500	69.7	1	11/15/24 15:15	11/20/24 12:56	7440-09-7	
Sodium	**24500**	ug/L	500	115	1	11/15/24 15:15	11/20/24 12:56	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**339**	mg/L	20.0	10.5	1		11/27/24 17:27		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**497**	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	**19.7**	mg/L	10.0	5.3	10		12/13/24 16:32	16887-00-6	H1
Fluoride	**0.47**	mg/L	0.20	0.12	1		12/13/24 16:19	16984-48-8	H1,IC
Sulfate	**79.1**	mg/L	10.0	5.5	10		12/13/24 16:32	14808-79-8	H1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCL4A
Pace Project No.: 60465156

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 SCL4A
Pace Project No.: 60465156

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 SCL4A
Pace Project No.: 60465156

QC Batch: 916636
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: 60464699003

METHOD BLANK: 3629486 Matrix: Water
Associated Lab Samples: 60464699003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	11/20/24 12:05	
Calcium	ug/L	<26.9	200	26.9	11/20/24 12:05	
Iron	ug/L	43.4J	50.0	9.1	11/20/24 12:05	
Magnesium	ug/L	<20.1	50.0	20.1	11/20/24 12:05	
Manganese	ug/L	2.4J	5.0	0.39	11/20/24 12:05	
Potassium	ug/L	<69.7	500	69.7	11/20/24 12:05	
Sodium	ug/L	<115	500	115	11/20/24 12:05	

LABORATORY CONTROL SAMPLE: 3629487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	934	93	85-115	
Calcium	ug/L	10000	9970	100	85-115	
Iron	ug/L	10000	10300	103	85-115	
Magnesium	ug/L	10000	9570	96	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	9760	98	85-115	
Sodium	ug/L	10000	9790	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3629488 3629489

Parameter	Units	60464695001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	113	1000	1000	1070	1080	96	96	70-130	1	20	
Calcium	ug/L	265	10000	10000	10300	10300	100	101	70-130	1	20	
Iron	ug/L	4810	10000	10000	15600	15800	107	110	70-130	2	20	
Magnesium	ug/L	ND	10000	10000	9500	9570	95	95	70-130	1	20	
Manganese	ug/L	591	1000	1000	1670	1690	107	110	70-130	1	20	
Potassium	ug/L	9450	10000	10000	20200	20200	107	108	70-130	0	20	
Sodium	ug/L	153000	10000	10000	171000	173000	179	197	70-130	1	20	M1

MATRIX SPIKE SAMPLE: 3629490

Parameter	Units	60464293011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	11200	1000	11900	76	70-130	
Calcium	ug/L	18400	10000	27900	95	70-130	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

MATRIX SPIKE SAMPLE: 3629490

Parameter	Units	60464293011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Iron	ug/L	148	10000	10700	105	70-130	
Magnesium	ug/L	1270	10000	10800	95	70-130	
Manganese	ug/L	21.1	1000	1070	104	70-130	
Potassium	ug/L	4880	10000	14500	96	70-130	
Sodium	ug/L	209000	10000	215000	62	70-130	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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, 60465156002, 60465156003, 60465156004

METHOD BLANK: 3632816 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012, 60465156002, 60465156003, 60465156004

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 SCL4A
Pace Project No.: 60465156

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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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

QC Batch: 917373
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: 60465156001, 60465156005

METHOD BLANK: 3632823 Matrix: Water
Associated Lab Samples: 60465156001, 60465156005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	12/10/24 16:58	
Calcium	ug/L	43.2J	200	26.9	12/10/24 16:58	
Iron	ug/L	18.1J	50.0	9.1	12/10/24 16:58	
Magnesium	ug/L	<20.1	50.0	20.1	12/10/24 16:58	
Manganese	ug/L	<0.39	5.0	0.39	12/10/24 16:58	
Potassium	ug/L	<69.7	500	69.7	12/10/24 16:58	
Sodium	ug/L	184J	500	115	12/10/24 16:58	

LABORATORY CONTROL SAMPLE: 3632824

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3632825 3632826

Parameter	Units	60465156001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	83.6J	1000	1000	932	881	85	80	70-130	6	20	
Calcium	ug/L	118000	10000	10000	128000	131000	107	132	70-130	2	20	M1
Iron	ug/L	13.6J	10000	10000	8860	8280	88	83	70-130	7	20	M1
Magnesium	ug/L	19900	10000	10000	29200	29100	92	92	70-130	0	20	M1
Manganese	ug/L	331	1000	1000	1240	1180	91	85	70-130	6	20	M1
Potassium	ug/L	5120	10000	10000	14300	13700	92	86	70-130	4	20	
Sodium	ug/L	4000	10000	10000	13000	12500	90	85	70-130	4	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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: 60464699003

METHOD BLANK: 3634992 Matrix: Water
Associated Lab Samples: 60464699003

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 SCL4A
Pace Project No.: 60465156

QC Batch: 918130
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60465156002, 60465156003, 60465156004, 60465156005

METHOD BLANK: 3635810 Matrix: Water
Associated Lab Samples: 60465156002, 60465156003, 60465156004, 60465156005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<10.5	20.0	10.5	12/02/24 15:36	

LABORATORY CONTROL SAMPLE: 3635811

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	481	96	90-110	

SAMPLE DUPLICATE: 3635812

Parameter	Units	60464769008 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	301	294	2	10	

SAMPLE DUPLICATE: 3635813

Parameter	Units	60465166003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	428	438	2	10	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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, 60465156001

METHOD BLANK: 3635814 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012, 60465156001

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	

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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: 60464699003

METHOD BLANK: 3630622 Matrix: Water
Associated Lab Samples: 60464699003

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

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

QC Batch: 917791
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60465156002, 60465156003, 60465156004, 60465156005

METHOD BLANK: 3634577 Matrix: Water
Associated Lab Samples: 60465156002, 60465156003, 60465156004, 60465156005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/26/24 15:36	

LABORATORY CONTROL SAMPLE: 3634578

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	979	98	80-120	

SAMPLE DUPLICATE: 3634579

Parameter	Units	60464925008 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6220	6380	3	10	

SAMPLE DUPLICATE: 3634580

Parameter	Units	60465166003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	556	553	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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, 60465156001

METHOD BLANK: 3635001 Matrix: Water
Associated Lab Samples: 60464699011, 60464699012, 60465156001

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

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

QC Batch: 918072
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: 60465156001, 60465156002, 60465156003, 60465156004, 60465156005

METHOD BLANK: 3635661 Matrix: Water
Associated Lab Samples: 60465156001, 60465156002, 60465156003, 60465156004, 60465156005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/03/24 09:33	
Fluoride	mg/L	<0.12	0.20	0.12	12/03/24 09:33	
Sulfate	mg/L	<0.55	1.0	0.55	12/03/24 09:33	

LABORATORY CONTROL SAMPLE: 3635662

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	94	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3635663 3635664

Parameter	Units	60465063007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.0	10	10	26.6	30.2	87	122	80-120	13	15	M1
Fluoride	mg/L	0.43	5	5	6.4	8.6	119	164	80-120	30	15	M1,R1
Sulfate	mg/L	116	10	10	129	132	128	160	80-120	3	15	E,M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3635666 3635667

Parameter	Units	60465156001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.8	5	5	9.3	8.8	111	99	80-120	6	15	
Fluoride	mg/L	0.37	2.5	2.5	3.7	3.3	132	118	80-120	10	15	M1
Sulfate	mg/L	63.3	50	50	114	110	101	93	80-120	4	15	

SAMPLE DUPLICATE: 3635665

Parameter	Units	60465063007 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	18.0	18.1	1	15	
Fluoride	mg/L	0.43	0.43	0	15	
Sulfate	mg/L	116	104	11	15	E

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

SAMPLE DUPLICATE: 3635668

Parameter	Units	60465156001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.8	3.8	0	15	
Fluoride	mg/L	0.37	0.38	3	15	
Sulfate	mg/L	63.3	63.2	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

QC Batch: 919543
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: 60464699003

METHOD BLANK: 3641950 Matrix: Water
Associated Lab Samples: 60464699003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/13/24 11:50	
Fluoride	mg/L	<0.12	0.20	0.12	12/13/24 11:50	IC
Sulfate	mg/L	<0.55	1.0	0.55	12/13/24 11:50	

LABORATORY CONTROL SAMPLE: 3641951

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	96	90-110	IC
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3641952 3641953

Parameter	Units	60464699002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	8.9	5	5	12.7	12.7	75	75	80-120	0	15	H1,M1
Fluoride	mg/L	0.44	2.5	2.5	3.5	3.5	121	122	80-120	0	15	H1,IC, M1
Sulfate	mg/L	35.2	50	50	101	84.2	132	98	80-120	18	15	H1,M1, R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCL4A
Pace Project No.: 60465156

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 SCL4A
Pace Project No.: 60465156

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

B	Analyte was detected in the associated method blank.
CL	The continuing calibration for this compound is outside of Pace Analytical acceptance limits. The results may be biased low.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H1	Analysis conducted outside the EPA method holding time.
IC	The initial calibration for this compound was outside of method control limits. The result is estimated.
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 SCL4A
Pace Project No.: 60465156

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60464699003	**S-UG-3**	EPA 200.7	916636	EPA 200.7	916671
60464699011	**S-BMW-1S**	EPA 200.7	917371	EPA 200.7	917460
60464699012	**S-BMW-3S**	EPA 200.7	917371	EPA 200.7	917460
60465156001	**S-TMW-1**	EPA 200.7	917373	EPA 200.7	917466
60465156002	**S-TMW-2**	EPA 200.7	917371	EPA 200.7	917460
60465156003	**S-TMW-3**	EPA 200.7	917371	EPA 200.7	917460
60465156004	**S-SCL4A-DUP-1**	EPA 200.7	917371	EPA 200.7	917460
60465156005	**S-SCL4A-FB-1**	EPA 200.7	917373	EPA 200.7	917466
60464699003	**S-UG-3**	SM 2320B	917909		
60464699011	**S-BMW-1S**	SM 2320B	918131		
60464699012	**S-BMW-3S**	SM 2320B	918131		
60465156001	**S-TMW-1**	SM 2320B	918131		
60465156002	**S-TMW-2**	SM 2320B	918130		
60465156003	**S-TMW-3**	SM 2320B	918130		
60465156004	**S-SCL4A-DUP-1**	SM 2320B	918130		
60465156005	**S-SCL4A-FB-1**	SM 2320B	918130		
60464699003	**S-UG-3**	SM 2540C	916954		
60464699011	**S-BMW-1S**	SM 2540C	917911		
60464699012	**S-BMW-3S**	SM 2540C	917911		
60465156001	**S-TMW-1**	SM 2540C	917911		
60465156002	**S-TMW-2**	SM 2540C	917791		
60465156003	**S-TMW-3**	SM 2540C	917791		
60465156004	**S-SCL4A-DUP-1**	SM 2540C	917791		
60465156005	**S-SCL4A-FB-1**	SM 2540C	917791		
60464699003	**S-UG-3**	EPA 300.0	919543		
60464699011	**S-BMW-1S**	EPA 300.0	919641		
60464699012	**S-BMW-3S**	EPA 300.0	919641		
60465156001	**S-TMW-1**	EPA 300.0	918072		
60465156002	**S-TMW-2**	EPA 300.0	918072		
60465156003	**S-TMW-3**	EPA 300.0	918072		
60465156004	**S-SCL4A-DUP-1**	EPA 300.0	918072		
60465156005	**S-SCL4A-FB-1**	EPA 300.0	918072		

WO# : 60465156

60465156

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

Cooler Temperature (°C): As-read 2.4/2.9 Corr. Factor -0.1 Corrected 2.3/2.8 6.3/1.7

Temperature should be above freezing to 6°C 0.4/1.8

Date and initials of person examining contents: 6/11/21 hy

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#:** 82727	☑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

60465156

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# 11	Invoice To:	Mark Haddock
Project Name:	AMEREN SCL4A	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 **: 1 1 3

Identify Container Preservative Type***: 1AM 1AM 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

Analysis Requested

Lab Use Only

Proj. Mgr: Jamie Church

AcctNum / Client ID:

Table #:

Profile / Template: 15856

Prelog / Bottle Ord. ID: EZ 3163159

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	Chloride/Fluoride/Sulfate	TDS / Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment
S-TMW-1	WT	G			11/20/24	1400	2			✓	✓	✓	
S-TMW-2	WT	G			11-19-24	1319	2			✓	✓	✓	
S-TMW-3	WT	G			11-19-24	1310	2			✓	✓	✓	
S-SCL4A-DUP-1	WT	G			11-19-24	-	2			✓	✓	✓	
S-SCL4A-FB-1	WT	G			11-19-24	1302	2			✓	✓	✓	
S-SCL4A-MS-1	WT	G			11/20/24	1400	2			✓	✓	✓	Collected @ S-TMW-1
S-SCL4A-MSD-1	WT	G			11/20/24	1	2			✓	✓	✓	

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: B, 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:
4	TL98	-0.1	2.3/2.8/0.3/1.7		

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
Rocksmith	11/20/24 1530		11/21 0745	
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

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

60465156

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# 11	Invoice To:	Mark Haddock
Project Name:	AMEREN SCL4A	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 III [ ] Level II [ ] 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 **: 3 1 3

Identify Container Preservative Type***: 2 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 3163159

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 (LE), 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	Chloride/Fluoride/Sulfate	TDS / Alkalinity	App III and Cat/An Metals (200.7)*	Sample Comment
S-TMW-1	WT												
S-TMW-2	WT												
S-TMW-3	WT												
S-SCL4A-DUP-1	WT												
S-SCL4A-FB-1	WT												
S-SCL4A-MS-1	WT												
S-SCL4A-MSD-1	WT												
S-UG-3	WT	G			11-14-24	1115	2			✓	✓	✓	

Additional Instructions from Pace®:
* - App III and Cat/An Metals* - EPA 200.7: B, 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:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Tracking Number:
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

Client: Rocksmith Geoeng Profile/EZ #: 3163159

Site: Notes: DO not log page 2 COC,

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																		3				3									
2	↓																		1				1									
3																			1				1									
4																			1				1									
5																			1				1									
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	
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: 60465156

Memorandum

January 22, 2025

To:	Project File Rocksmith Geoengineering, LLC	**Project Number:**	23007-24
CC:	Mark Haddock, Jeffrey Ingram		
From:	Grant Morey	**Email:**	grant.morey@rocksmithgeo.com
RE:	**Data Validation Summary, Sioux Energy Center – SCL4A – Data Package 60465156**		

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 analyzed outside of hold time controls, the sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When an initial laboratory calibration was outside of method control limits, the sample result was qualified as an estimate (J for detects, UJ for non-detects).
- 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).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCL4A
Project Number: 23009-24
Reviewer: G. Morey
Validation Date: 1/22/2025

Laboratory: Pace Analytical
SDG #: 60465156
Analytical Method (type and no.): EPA 200.7/200.8 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-SCL4A-DUP-1, S-SC4LA-FB-1, S-UG-3, 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			11/19/24-11/20/24
b) Sampling team indicated?	x			JTR , JDQ, 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)?	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	S-SCL4A-FB-1 @ S-TMW-3
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-SCL4A-DUP-1 collected @ S-TMW-2
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			

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 sulfate were diluted in several samples; no qualification necessary.

Chloride, fluoride and sulfate analyzed outside of hold time controls for some samples, results qualified as estimates.

Initial calibration for fluoride for one sample was outside method control limits, result qualified as estimate.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

3629486: iron (43.4J) and manganese (2.4J), associated with sample -003. Iron < 10x blank and RL, result qualified as non detect. Manganese > 10x blank and RL, no qualification necessary.

3632823: calcium (43.2J), iron (18.1J), and sodium (184J). Associated with samples -001 and -005.

-001 calcium and sodium, results > 10x blank and RL, no qualification necessary. Iron < 10x blank and RL, result qualified as non detect.

-005, calcium and sodium results < 10x blank and RL, results qualified as non detect. Iron result non detect, no qualification necessary.

Field Blanks:

Field blank collected at S-TMW-3: calcium (36.3J), sodium (184J), and fluoride (0.22). Calcium and sodium > 10x blank and RL, no qualification necessary. Fluoride < 10x blank and > RL, result qualified as estimate.

Duplicates:

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

MS/MSD:

3629488/3629489: MS/MSD recovery high for for sodium. Associated with unrelated sample, no qualification necessary.

3629490: MS recovery low for sodium. Associated with unrelated sample, no qualification necessary.

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

3632825/3632826: MSD recovery high for calcium, MS recovery and RPD within control. Associated with sample -001, no qualification necessary.

3635663/3635664: MSD recovery high for chloride, MS recovery and RPD within control. No qualification necessary.

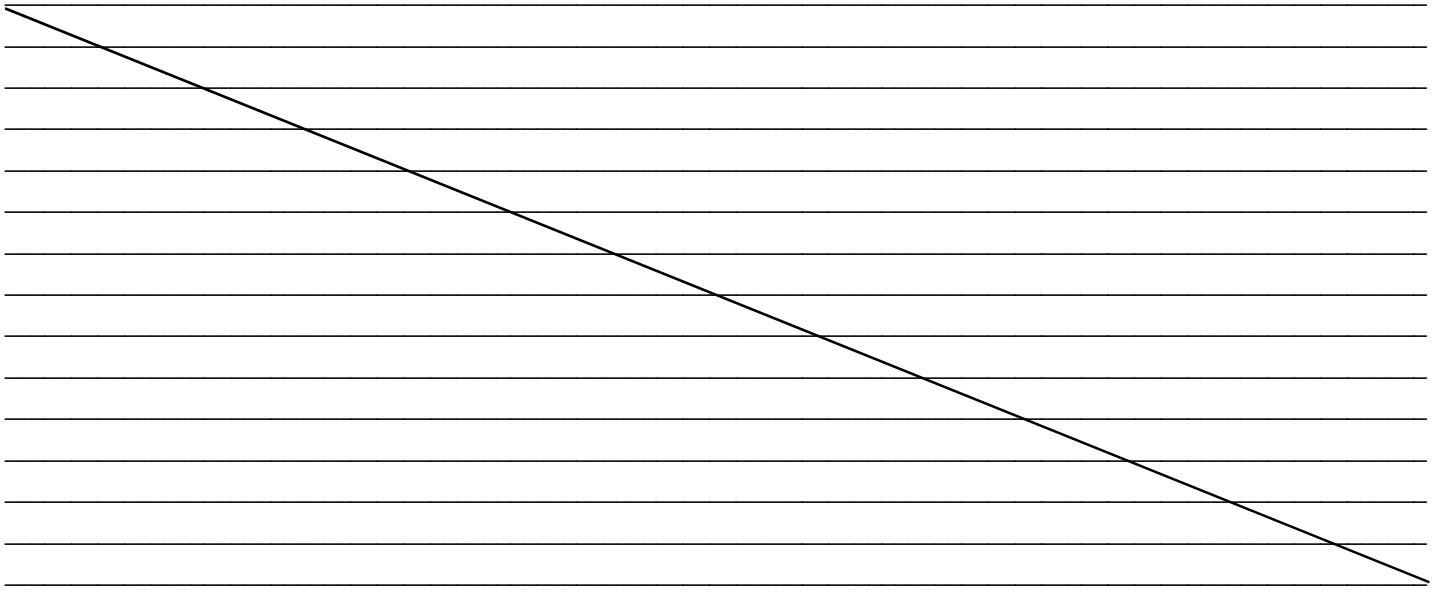
MSD recovery and RPD high for fluoride, MS recovery within control. MS/MSD recovery high for sulfate, RPD within control. Associated with unrelated sample, no qualification necessary.

3635666/3635667: MS recovery high for fluoride, MSD and RPD within control limits. Associated with -001, no qualification necessary.

3641952/3641953: MS/MSD recovery low for chloride, RPD within control. MS/MSD recovery high for fluoride, RPD within control. MS recovery high for sulfate, MSD recovery and RPD within control. Associated with unrelated sample, no qualification necessary.

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

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



QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UG-3	Chloride	19.7	J	Analyzed outside hold time
"	Fluoride	0.47	J	"
"	Sulfate	79.1	J	"
"	Iron	50	U	Detected in blank, result < 10X blank and RL
S-TMW-1	"	50	U	"
S-SCL4A-FB-1	Calcium	200	U	"
"	Sodium	500	U	"
S-TMW-3	Fluoride	0.32	J	Detected in blank, result < 10x field blank and > RL
S-UG-3	Fluoride	0.47	J	Initial calibration outside control limits

Signature: Grant Morey Date: 1/22/2025

Appendix B

Alternative Source Demonstration – November 2023 Sampling Event

REPORT

SCL4A – 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 Road
Maryland Heights, MO 63043

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1.0 CERTIFICATION STATEMENT

This *SCL4A – 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 *SCL4A – 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 SCL4A – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for Statistically Significant Increases (SSI) identified for Ameren Missouri's (Ameren) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) Cell 4A, referred to as the SCL4A. 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 the 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 the SCL4A. The SEC is approximately 1,100 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 SCL4A 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, which can range from approximately 100 to 130 feet in thickness, make up 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 Cell 4A – SCL4A

UWL Cell 4A is referred to by Ameren as the SCL4A, or "Landfill Cell 4A." The SCL4A is approximately 15 acres in size and is located south of the generating plant on the south side of Highway 94 (**Figure 1**). The CCR Unit manages CCR from the SEC including "fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels" (Gredell and Reitz & Jens, 2014). These wastes are managed using a dry disposal process and are moisture conditioned (30-40% moisture content) to minimize dust and facilitate disposal. The CCR waste is trucked across Highway 94 from the plant and disposed in the SCL4A.

The SCL4A 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 in order 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 seasonal low elevation for groundwater. Quarterly groundwater samples have been collected at UG-3 since June 2008 for the analysis of state required UWL

parameters, and TMW-1, TMW-2, and TMW-3 have been sampled since May 2016 for CCR Rule sampling events.

The permit for the Sioux UWL was issued July 30, 2010 (permit #0918301) for the SCPC (Cell 1). Nine sampling events were performed prior to July 30, 2010, and represent groundwater quality prior to CCR placement in the SCPC. The SCL4A was the second cell that was constructed at this UWL. The SCL4A construction was not completed until 2014 and no CCR was placed in the unit until after the final revisions to the Proposed Construction Permit Modification on August 16, 2014. 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) the required eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of the CCR Rule.

The groundwater monitoring system for the SCL4A consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. One existing monitoring well (UG-3) was installed by Gredell Engineering Resources, Inc., in December 2007 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-1, TMW-2, TMW-3, BMW-1S, and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCL4A GMP and the SCL4A 2017 Annual Report.

Between May 2016 and June 2017, eight baseline sampling events were completed for the SCL4A. After baseline sampling, the first Detection Monitoring event was completed in November 2017 and Detection Monitoring has continued on a semi-annual basis thereafter. Laboratory testing was performed for the following Appendix III constituents 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 SCL4A Statistical Analysis Plan (SAP). In August 2019 and June 2021, the background dataset used to calculate statistical limits was expanded to include a total of eight additional Detection Monitoring events, as outlined in the SAP, bringing the total number of background observations to at least sixteen per constituent per well. The following provides a summary of the Detection Monitoring results to date.

Since November 2017, several ASDs have been prepared for detections in well UG-3, TMW-1, and TMW-2. These previous ASDs are available in the 2018 through 2023 Annual Reports for the SCL4A 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 SCL4A, but rather primarily the result of relatively low calculated UPLs

that were not representative of the natural geochemical variability within the alluvial aquifer or primarily caused by the SCL4A being downgradient from the SCPA, which is currently in Corrective Action.

In November 2023, initial exceedances were identified for chloride at TMW-2 and TMW-3. Verification sampling results from February 2024 confirmed these to be SSIs. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASE

The November 2023 SSIs for chloride occurred at monitoring wells TMW-2 and TMW-3. These wells are screened the upper portion of the alluvial aquifer just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, TMW-2 and TMW-3 are located south of the SCL4A and Highway 94, 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 those pre-disposal data with the results from the eight CCR Rule baseline events, it was concluded that the groundwater at the SCL4A contained low-level pre-existing impacts from CCR that pre-date SCL4A operation. As a result of these pre-existing impacts, the SCL4A statistical analysis plan uses intrawell upper prediction limits (UPL) 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.

Table 2 provided in the text provides a summary of the historical UPLs at TMW-2, TMW-3, and the background wells (BMW-1S and BMW-3S) as well as the range of results and most recent sampling results.

Table 2: Review of Statistically Significant Increase

Constituent	Well ID	UPL Based on Baseline Events	August 2019 Updated UPL	June 2021 Updated UPL	March 2024 Updated UPL	Baseline Sampling Event Range	Detection Monitoring Sampling Range (November 2017 – May 2023)	November 2023 Result	February 2024 Result
Chloride (mg/L)	TMW-2	4.151	3.954	4.641	4.531	2.4 – 3.9	1.8 – 4.7	5.8	9.1
Chloride (mg/L)	TMW-3	3.1	3.1	3.1	3.383	1.6 – 3.1	1.6 – 3.6	5.1	9.1
Chloride (mg/L)	Background Wells (BMW-1S & BMW-3S)	12.34	12.32	13.12	13.65	1.9 – 16.8	6.3 – 13.2	7.2, 13.4	NS

Notes:
1) mg/L – milligrams per liter.
2) UPL – upper prediction limit.
3) UPLs calculated using Sanitas™ software.
4) UWL – Utility Waste Landfill.
5) J – result is an estimated value.
6) NS – Not Sampled.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSI at the SCL4A is not caused by a release from the SCL4A, but rather from an alternative source. The following section describes the different lines of evidence, listed below, that demonstrate this position.

- Presence of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCL4A operation, especially on the northern side of the SCL4A.
- Similarity of chloride concentrations in nearby and background monitoring wells.
- Use of road salt (NaCl) during the construction of the adjacent SCPD Cell and nearby.

- Documentation of construction of the SCL4A with a composite liner system including a 60-mil HDPE geomembrane liner and a 2-foot thick compacted clay layer.

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 SCL4A has historically received fly ash. FGD type wastes at the SEC are managed at the SCPC and SCPD, located to the west of the SCL4A.

5.2 Evaluation of SSI

5.2.1 Boron Concentrations

Boron is typically the key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early indicator of impacts from a CCR Unit. If groundwater was impacted by the SCL4A, current boron concentrations should be statistically elevated with respect to pre-CCR placement, background monitoring wells, and compared to those in the baseline sampling.

Figure 2 displays historical boron concentrations at TMW-2 and TMW-3 as well as background wells BMW-1S and BMW-3S. If the SSIs at TMW-2 and TMW-3 were caused by impacts from the SCL4A, boron concentrations would increase as a first indicator of CCR influence on the groundwater. **Figure 2** demonstrates that current boron concentrations are nearly identical to those from previous sampling events and background levels. This information displays that TMW-2 and TMW-3 do not have boron impacts, and therefore, a source other than CCR is likely the cause of the SSIs.

5.2.2 Chloride Concentrations

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. At the SEC, FGD wastes are managed in the SCPC, located west of the SCL4A (see **Figure 1**). The nearest public roadways to TMW-2 are Highway 94 approximately 1,400 feet to the north, and Dwiggins Road approximately 1,100 feet to the south. Additionally, there is a CCR haul road directly north of the SCL4A and there were equipment haul roads to the east and south of the SCL4A in 2023 associated with the construction of the SCPD.

Chloride concentrations for the November 2023 sampling event at TMW-2 and TMW-3 are 5.8 and 5.1 respectively. Chloride concentrations of 9.1 mg/L were present in the February 2024 sampling event for both TMW-2 and TMW-3. These values are just above the original calculated UPL of 4.151 and 3.1 mg/L for chloride concentrations at TMW-2 and TMW-3, which was calculated based on eight baseline sampling events in 2016 and 2017 during which time chloride concentrations ranged from 2.4 to 3.9 and 1.6 to 3.1 mg/L, respectively. There have been subsequent updates for the UPLs since the initial baseline limit, and the latest chloride limits from the March 2024 background updates are 4.531 and 3.383 for TMW-2 and TMW-3, respectively.

Chloride concentrations in shallow alluvial background monitoring wells located 1 mile to the northeast of SCL4A (wells BMW-1S and BMW-3S) have ranged from 1.9 to 16.8 mg/L since they were installed in 2016. Based on baseline sampling, the initial background UPL for chloride was 12.34 mg/L. The current UPL as of the latest background updates (June 2024) is 13.65 mg/L. Each of these background UPLs are greater than any chloride result at TMW-2 and TMW-3.

Figure 3 displays chloride results in the monitoring wells with chloride SSIs (TMW-2 and TMW-3) compared to background results from site background wells BMW-1S and BMW-3S. This figure displays that the concentrations of 5.8 and 5.1 mg/L are well below those reported for background wells at 6.3 – 13.2 mg/L. This demonstrates that the results from TMW-2 and TMW-3 are well below those of unimpacted background limits for chloride in the shallow zone of the alluvial aquifer.

Throughout 2023 and during the time of the November 2023 sampling event, the new SCPD cell was being constructed to the east of the SCL4A. Road salt (NaCl) applied to roadways for ice control is a common alternative source for elevated chloride concentrations, especially in areas near highways or construction zones. **Figures 4** and **5** display a multi-constituent time series plot comparing chloride and sodium values which are the common constituents associated with road salt. This plot displays a notable correlation between sodium and chloride, indicating that these two constituents are moving through the aquifer together. The correlation and coinciding spikes of sodium and chloride are a clear indication that elevated chloride concentrations levels at TMW-2 and TMW-3 are caused by road salt applications associated with the construction of the SCPD and/or nearby roads.

6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCL4A IMPACT

Based on the information presented in Section 5, above, the SSIs for chloride in the November 2023 monitoring event at TMW-2 and TMW-3 are not a result of impacts from the SCL4A. The SSIs appear to be a result of (1) pre-existing low concentrations of CCR indicators from the upgradient SCPA that predate the SCL4A, (2) relatively low calculated UPLs, (3) a relatively small set of baseline data that does not reflect the extent of natural temporal and spatial variability of groundwater chemistry within the aquifer and (4) the use of road salt (NaCl) during the construction of the SCPD and/or use on nearby roads. Chloride concentrations at TMW-2 and TMW-3 are elevated compared to their intrawell UPLs, however, when compared to shallow background monitoring wells, the concentrations are well below the background limits. Additionally, comparisons of chloride and sodium concentrations display that these two constituents are spiking and declining together, indicating that they are moving through the aquifer together. The recent spike in chloride and sodium is associated with de-icing from the construction of the adjacent SCPD and/or salting nearby roads.

Along with the lines of evidence listed above, SCL4A is documented to be properly constructed with 2 feet of low permeability compacted clay overlain by a 60-mil HDPE liner.

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Tables

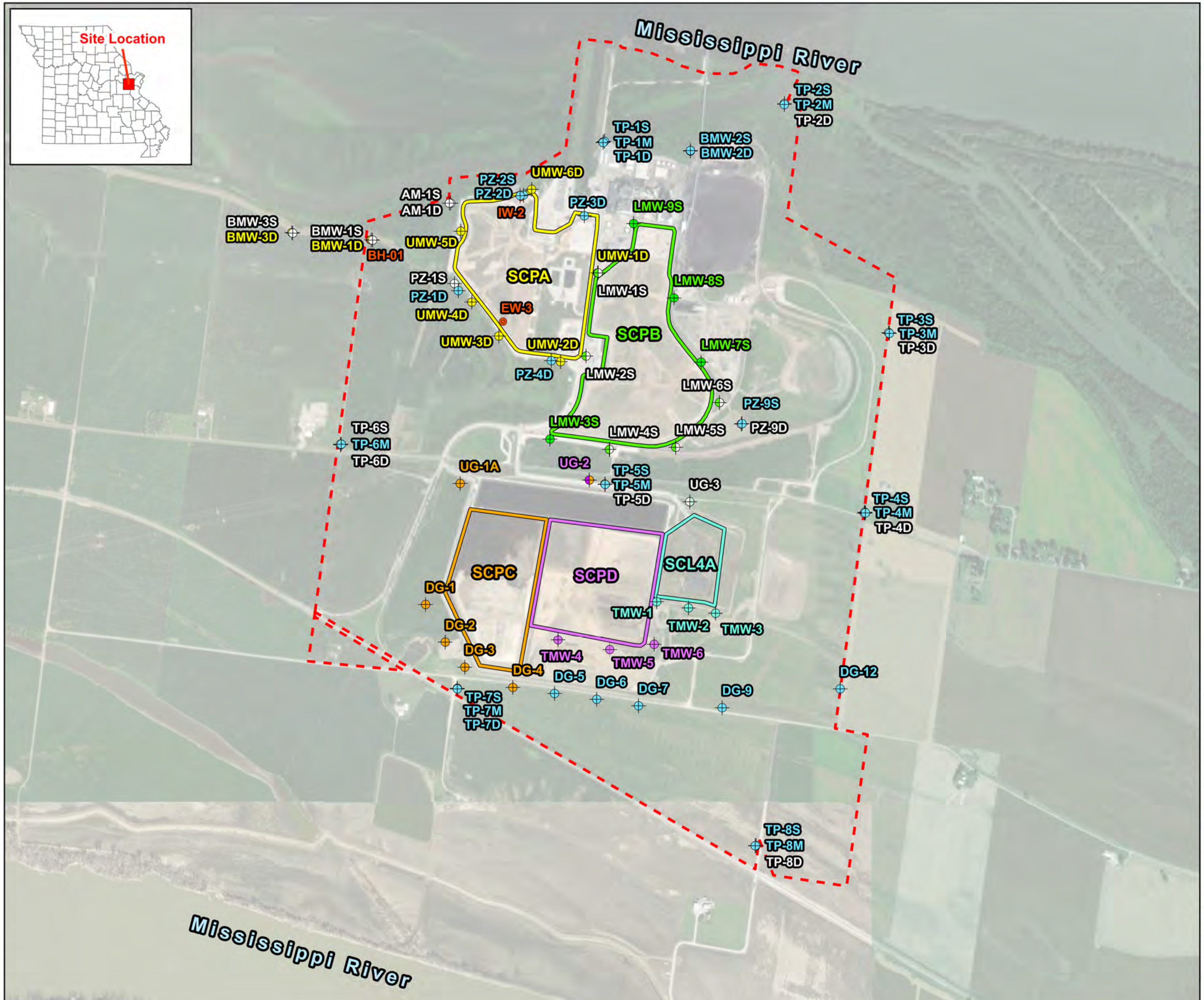
Table 4
November 2023 Detection Monitoring Results
SCL4A - Landfill Cell 4A
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1S	BMW-3S	Prediction Limit UG-3	UG-3	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
November 2023 Detection Monitoring Results											
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.678-7.373	7.04	6.531-7.438	7.11	6.71-7.226	6.96	6.573-7.424	7.01
BORON, TOTAL	µg/L	57.9 J	58.9 J	1,105	638	DQR	80.2 J	101.4	85.9 J	109	96.1 J
CALCIUM, TOTAL	µg/L	136,000	114,000	171,791	107,000	118,531	107,000	132,299	123,000	145,416	134,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	84.34	34.5	4.359	2.3	4.531	5.8	3.383	5.1
FLUORIDE, TOTAL	mg/L	ND	ND	0.39	ND	0.4613	ND	0.4211	ND	0.37	ND
SULFATE, TOTAL	mg/L	46.9	12.3	136.3	65.0	62.35	54.8	86.88	28.8	65.78	40.9
TOTAL DISSOLVED SOLIDS	mg/L	475	398	661.4	504	452.6	368	518	430	493	475
February 2024 Verification Sampling Event											
DATE	NA								2/7/2024		2/7/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L								9.1		9.1
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. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
7. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
8. 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: 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

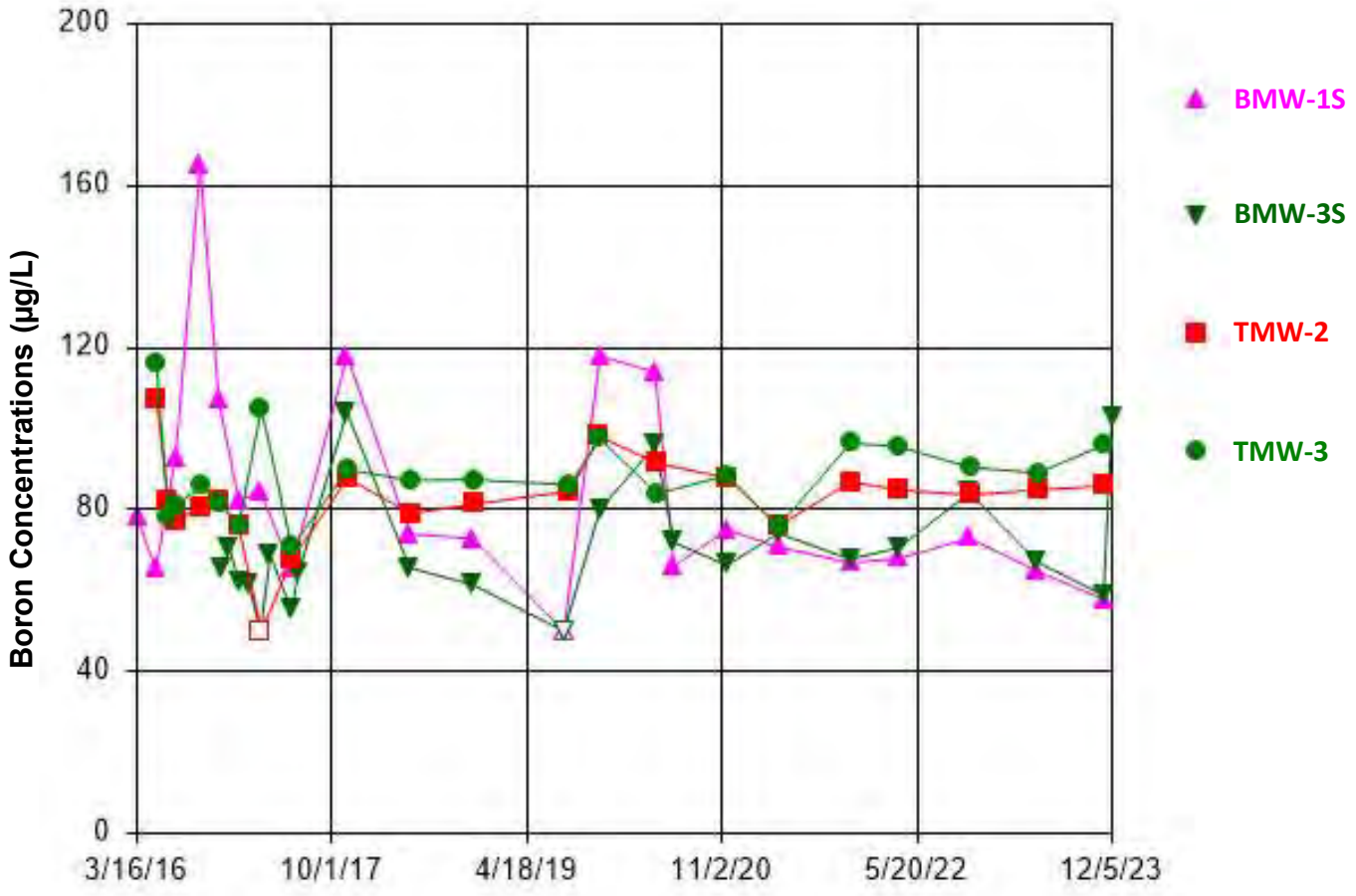
PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

Ameren

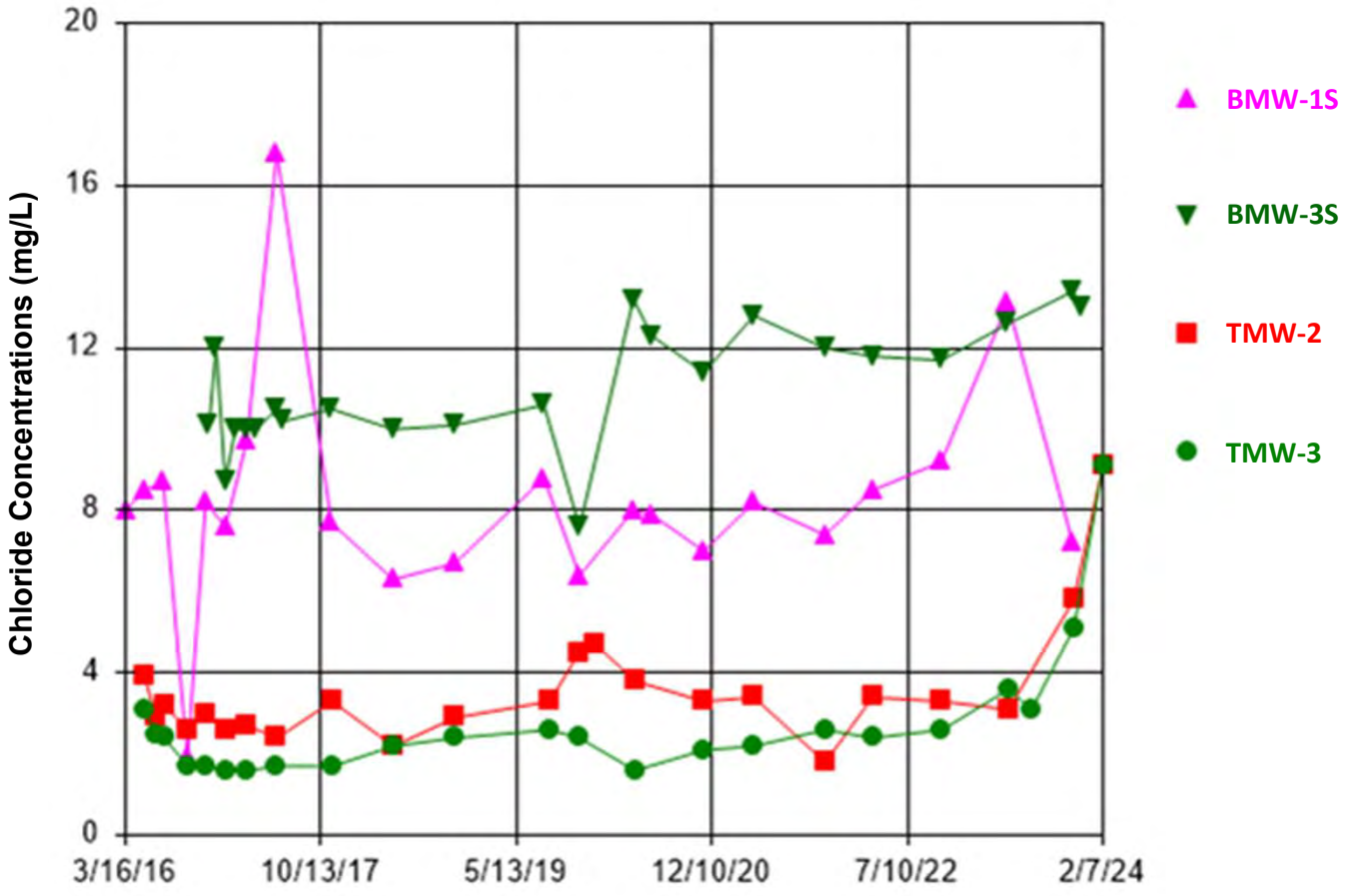
ROCKSMITH GEOENGINEERING

DESIGN	JSI	YYYY-MM-DD	2023-03-29
PREPARED	JSI	PROJECT No.	23009
REVIEW	GTM		
APPROVED	MNH	FIGURE 1	



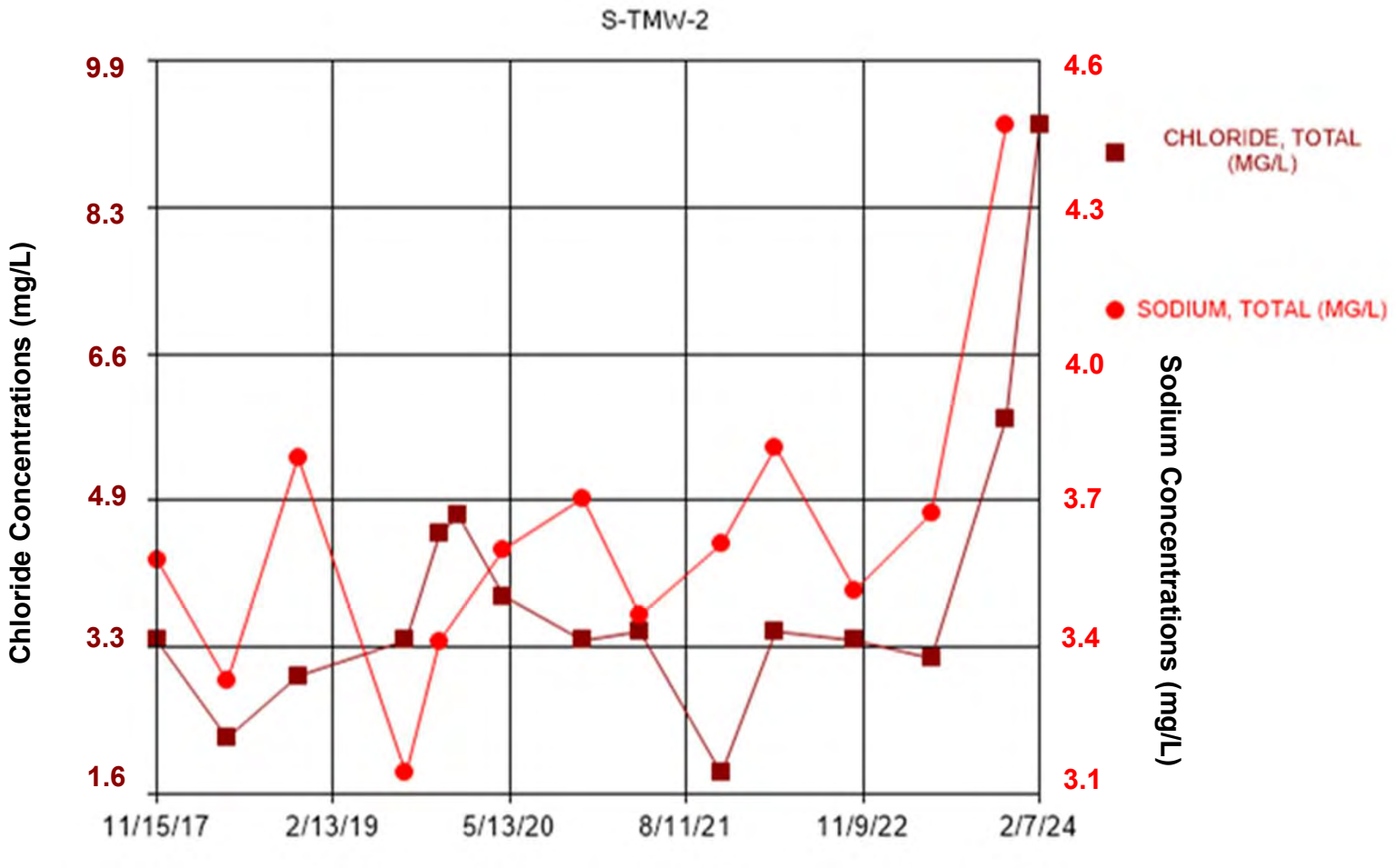
Notes
1) µg/L – Micrograms per liter.
2) Points not connected to lines are considered outliers as specified in the Updated Statistical Limit Technical Memorandum for the SCL4A.
3) Non-detected concentrations are depicted as unfilled points.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**					**Timeseries Plot of Boron Concentrations**		
DRAWN	CHECKED	REVIEWED	DATE		Rev No.	JOB NO.	FIGURE
JSI	JTA	MNH	2024-06-20		NA	23009-24	**2**



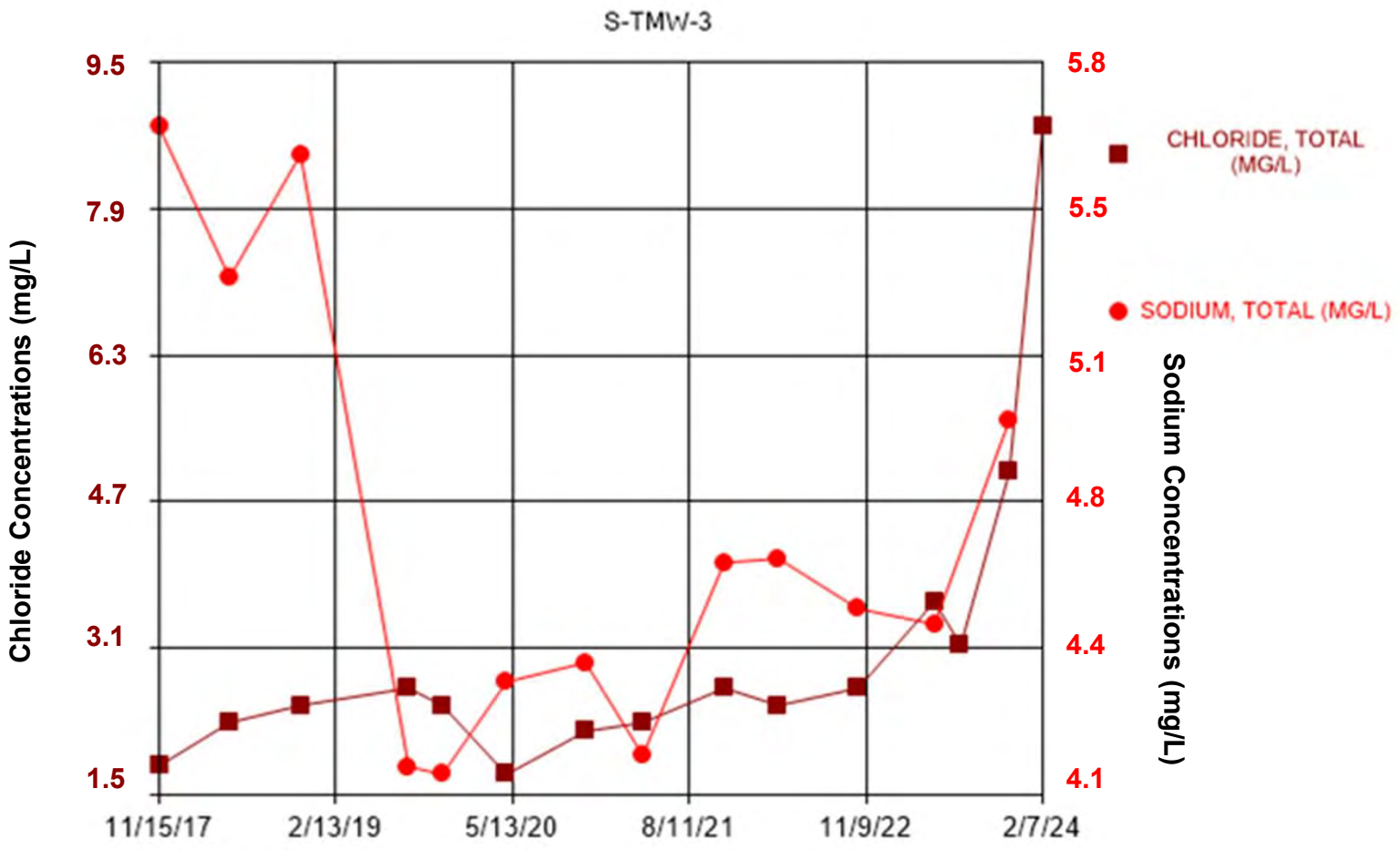
Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**					**Time Series Plot for Chloride Concentrations**		
DRAWN	CHECKED	REVIEWED	DATE		Rev No.	JOB NO.	FIGURE
JSI	JTA	MNH	2024-06-20		NA	23009-24	**3**



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**					**Time Series Plot for Chloride and Sodium Concentrations – TMW-2**		
DRAWN	CHECKED	REVIEWED	DATE		Rev No.	JOB NO.	FIGURE
JSI	JTA	MNH	2024-06-20		NA	23009-24	**4**



Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER					Time Series Plot for Chloride and Sodium Concentrations – TMW-3		
DRAWN JSI	CHECKED JTA	REVIEWED MNH	DATE 2024-06-20	ROCKSMITH GEOENGINEERING	Rev No. NA	JOB NO. 23009-24	FIGURE 5

Appendix C

Alternative Source Demonstration – May 2024 Sampling Event

REPORT

SCL4A – 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 Road
Maryland Heights, MO 63043

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TABLES

FIGURES

1.0 CERTIFICATION STATEMENT

This *SCL4A – 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 *SCL4A – 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 SCL4A – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) Cell 4A, referred to as the SCL4A. 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 the 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 the SCL4A. The SEC is approximately 1,100 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 SCL4A 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, which can range from approximately 100 to 130 feet in thickness, make up 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 Cell 4A – SCL4A

UWL Cell 4A is referred to by Ameren as the SCL4A, or "Landfill Cell 4A." The SCL4A is approximately 15 acres in size and is located south of the generating plant on the south side of Highway 94 (**Figure 1**). The CCR Unit manages CCR from the SEC including "fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels" (Gredell and Reitz & Jens, 2014). These wastes are managed using a dry disposal process and are moisture conditioned (30-40% moisture content) to minimize dust and facilitate disposal. The CCR waste is trucked across Highway 94 from the plant and disposed in the SCL4A.

The SCL4A 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 in order 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 seasonal low elevation for groundwater. Quarterly groundwater samples have been collected at UG-3 since June 2008 for the analysis of state required UWL

parameters, and TMW-1, TMW-2, and TMW-3 have been sampled since May 2016 for CCR Rule sampling events.

The permit for the SEC UWL was issued July 30, 2010 (permit #0918301) for the SCPC (Cell 1). Nine sampling events were performed prior to July 30, 2010, and represent groundwater quality prior to CCR placement in the SCPC. The SCL4A was the second cell that was constructed at this UWL. The SCL4A construction was not completed until 2014 and no CCR was placed in the unit until after the final revisions to the Proposed Construction Permit Modification on August 16, 2014. 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) the required eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of the CCR Rule.

The groundwater monitoring system for the SCL4A consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. One existing monitoring well (UG-3) was installed by Gredell Engineering Resources, Inc., in December 2007 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-1, TMW-2, TMW-3, BMW-1S, and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCL4A GMP and the SCL4A 2017 Annual Report.

Between May 2016 and June 2017, eight baseline sampling events were completed for the SCL4A. After baseline sampling, the first Detection Monitoring event was completed in November 2017 and Detection Monitoring has continued on a semi-annual basis thereafter. Laboratory testing was performed for the following Appendix III constituents 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 SCL4A Statistical Analysis Plan (SAP). In March 2024, the background dataset used to calculate statistical limits was expanded to include a total number of background observations to at least 20 per constituent per well. The following provides a summary of the Detection Monitoring results to date.

Since November 2017, several ASDs have been prepared for SSIs at wells UG-3, TMW-1, TMW-2, and TMW-3. These previous ASDs are available in the 2018 through 2023 Annual Reports for the SCL4A 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 SCL4A, but rather primarily the result of relatively low calculated UPLs that were not representative of the natural geochemical variability within the alluvial aquifer or primarily caused by the SCL4A being downgradient from the SCPA, which is currently in Corrective Action.

In May 2024, initial exceedances were identified for calcium, chloride, and total dissolved solids at TMW-1, calcium at TMW-2, and chloride at TMW-3. Verification sampling results from July 2024 confirmed SSIs of calcium and chloride at TMW-1, calcium at TMW-2, and chloride at TMW-3. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

The May 2024 SSIs occurred at monitoring wells TMW-1, TMW-2, and TMW-3. These wells are screened the upper portion of the alluvial aquifer just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, TMW-1, TMW-2, and TMW-3 are located south of the SCL4A and Highway 94, 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 those pre-disposal data with the results from the eight CCR Rule baseline events, it was concluded that the groundwater at the SCL4A contained low-level pre-existing impacts from CCR that pre-date SCL4A operation. As a result of these pre-existing impacts, the SCL4A statistical analysis plan uses intrawell upper prediction limits (UPL) 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.

Table 2 provided in the text provides a summary of the historical UPLs at TMW-2, TMW-3, and the background wells (BMW-1S and BMW-3S) as well as the range of results and most recent sampling results.

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	August 2019 Updated UPL	June 2021 Updated UPL	Current UPL (March 2024 Update)	Baseline Sampling Event Range	Detection Monitoring Sampling Range (November 2017 – February 2024)	May 2024 Result	July 2024 Result
Calcium (µg/L)	TMW-1	118,318	115,800	119,842	118,531	97,300 – 114,000	91,700 – 119,000	124,000 J	125,000 J
Chloride (mg/L)	TMW-1	5.179	4.463	4.199	4.359	1.8 – 3.9	1.5 – 4.6	12.8 J	9.0 J
Calcium (µg/L)	TMW-2	135,076	134,272	133,759	132,299	105,000 – 127,000	105,000 – 131,000	135,000	134,000
Chloride (mg/L)	TMW-3	3.1	3.1	3.1	3.383	1.6 – 3.1	1.6 – 9.1	14.2	19.1
Calcium (µg/L)	Background Wells (BMW-1S & BMW-3S)	170,705	168,826	166,512	174,465	110,000 – 162,000	102,000 - 184,000	133,000 & 116,000	NS
Chloride (mg/L)	Background Wells (BMW-1S & BMW-3S)	12.34	12.32	13.12	13.65	7.6 – 12.0*	6.3 – 13.4	7.2 & 11.1	NS

Notes:
1) mg/L – milligrams per liter.
2) UPL – upper prediction limit.
3) UPLs calculated using Sanitas™ software.
4) UWL – Utility Waste Landfill.
5) J – result is an estimated value.
6) NS – Not Sampled.
7) The UPLs for the background wells listed are used for the SCPB detection monitoring network. Current UPLs for these wells were most recently updated in September 2023.
8) *Two outliers at BMW-1S are not included in the baseline range. A low outlier of 1.9 mg/L and a high outlier of 16.8 mg/L.

5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at the SCL4A are not caused by a release from the SCL4A, but rather from an alternative source. The following section describes the different lines of evidence, listed below, that demonstrate this position.

- Presence of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCL4A operation, especially on the northern side of the SCL4A.
- Similarity to chloride and calcium concentrations at nearby and background monitoring wells.
- A lack of elevated boron concentrations that would be expected with impacts from the SCL4A.
- Use of road salt (NaCl) during the construction of the adjacent SCPD Cell and nearby.
- Documentation of construction of the SCL4A with a composite liner system including a 60-mil HDPE geomembrane liner and a 2-foot thick compacted clay layer.

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.

Historically, the SCL4A has predominately received fly ash, but other minor amounts of other CCR materials are also managed at the unit. FGD type wastes at the SEC are managed at the SCPC and SCPD, located to the west of the SCL4A.

5.2 Evaluation of SSIs

5.2.1 Boron Concentrations

Boron is typically the key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early indicator of impacts from a CCR Unit. If groundwater was impacted by the SCL4A, current boron

concentrations should be statistically elevated with respect to pre-CCR placement baseline results as well as background monitoring results.

Figure 2 displays historical boron concentrations at TMW-1, TMW-2, and TMW-3 as well as background wells BMW-1S and BMW-3S. If the SSIs at TMW-1, TMW-2 and TMW-3 were caused by impacts from the SCL4A, boron concentrations would increase as a first indicator of CCR influence on the groundwater. **Figure 2** demonstrates that current boron concentrations are nearly identical to those from previous sampling events and background levels. This information displays that TMW-1, TMW-2, and TMW-3 do not have boron impacts, and therefore, a source other than CCR is likely the cause of the SSIs.

5.2.2 Chloride Concentrations

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. At the SEC, FGD wastes are managed in the SCPC and SCPD, located west of the SCL4A (see **Figure 1**). The nearest public roadways to TMW-1, TMW-2, and TMW-3 are Highway 94 approximately 1,400 feet to the north, and Dwiggins Road approximately 1,100 feet to the south. Additionally, there is a CCR haul road directly north of the SCL4A, and there were temporary equipment haul roads constructed in 2023 to the east and south of the SCL4A associated with the construction of the SCPD.

Chloride concentrations from the May 2024 sampling event at TMW-1 and TMW-3 are 12.8 J and 14.2 mg/L, respectively. Chloride concentrations of 9.0 J and 19.1 mg/L were present in the July 2024 sampling event for TMW-1 and TMW-3, respectively. These values are just above the original calculated chloride UPLs of 5.179 and 3.1 mg/L at TMW-1 and TMW-3, which were calculated based on eight baseline sampling events in 2016 and 2017 during which time chloride concentrations ranged from 1.8 to 3.9 (TMW-1) and 1.6 to 3.1 (TMW-3) mg/L. There have been subsequent updates to the UPLs since the initial baseline limits, and most recently, UPLs were updated in March 2024. Current UPLs for chloride are 4.359 mg/L at TMW-1 and 3.383 mg/L at TMW-3.

Chloride concentrations in shallow alluvial background monitoring wells located approximately 1 mile to the northwest of SCL4A (BMW-1S and BMW-3S) have ranged from 6.3 to 13.4 mg/L since their installation in 2016, with outliers of 1.9 and 16.8 mg/L at BMW-1S and 7.6 mg/L at BMW-3S. Based on baseline sampling, the initial UPL for chloride was 12.34 mg/L at these shallow background wells. The UPL as of the latest background updates (completed September 2023) is 13.65 mg/L, which is the limit currently used for the SCPB detection monitoring network. **Figure 3** displays chloride results in at the monitoring wells with chloride SSIs (TMW-1 and TMW-3) compared to results from site background wells BMW-1S and BMW-3S. This figure displays that the May 2024 chloride concentrations of 12.8 J and 14.2 mg/L are largely within the range of background results, which display a degree of natural variability.

Throughout 2023 and into early 2024, the expanded SCPD cell was being constructed to the west of the SCL4A. During construction, road salt (NaCl) was applied to roadways for ice control. The application of road salt is a common alternative source for elevated chloride concentrations, especially in areas near highways or construction zones. **Figures 4, 5** and **6** display a multi-constituent time series plot for each downgradient SCPD monitoring well that compares concentrations of chloride and sodium, the common constituents associated with road salt. This plot displays a notable correlation between sodium and chloride, indicating that these two constituents are moving through the aquifer together. The correlation and coinciding spikes of sodium and chloride are a clear indication that elevated chloride concentrations at TMW-1 and TMW-3 are caused by road salt applications associated with the construction of the SCPD and/or nearby roads. The same correlation is also present at TMW-2; however, during this sampling event the chloride concentrations were lower. The correlation and coinciding spikes of sodium and chloride are a clear indication that elevated chloride concentrations at TMW-1 and TMW-3 are caused by road salt applications associated with the construction of the SCPD and/or nearby roads.

5.2.3 Calcium Concentrations

Calcium is not known to be a key indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017), but can be an indicator for FGD type wastes. At the SEC, FGD waste is managed in the nearby SCPC and SCPD units to the west of the SCL4A; therefore, elevated concentrations in calcium alone are not a good indicator of CCR impacts from the SCL4A.

Calcium concentrations for the May 2024 sampling event at TMW-1 and TMW-2 are 124,000 J and 135,000 µg/L, respectively. Calcium concentrations of 125,000 J and 134,000 µg/L were present in the July 2024 verification sampling event at these respective wells. These values are just above the original calculated UPL of 118,318 µg/L at TMW-1 and below the original UPL of 135,076 µg/L at TMW-2. The original UPLs were calculated based on eight baseline sampling events in 2016 and 2017, when calcium concentrations ranged from 91,700 to 114,000 µg/L at TMW-1 and 105,000 to 131,000 µg/L at TMW-2. There have been subsequent updates for the UPLs since the initial baseline limits were established, with the latest chloride limits from March 2024 background updates being 118,531 and 132,299 µg/L for TMW-1 and TMW-3, respectively.

Calcium concentrations in shallow alluvial background monitoring wells located 1-mile to the northwest of SCL4A (BMW-1S and BMW-3S) have ranged from 102,000 to 184,000 µg/L since they were installed in 2016. Based on baseline sampling, the initial background UPL for calcium was 170,705 µg/L. The UPL as of the latest background updates (completed September 2023) is 174,465 µg/L, which is the limit currently used for the SCPB detection monitoring network.

Figure 7 displays calcium results in the monitoring wells with calcium SSIs (TMW-1 and TMW-2) compared to results from site background wells BMW-1S and BMW-3S. This figure displays that the concentrations of 124,000 J µg/L and 135,000 µg/L are well below the background UPL of 174,465 µg/L. This demonstrates that calcium concentrations at TMW-1 and TMW-2 are well below those of unimpacted background groundwater in the shallow zone of the alluvial aquifer. This provides evidence that the data points used to calculate the intrawell UPL for calcium at TMW-1 and TMW-2 do not completely account for the natural geochemical variability within the groundwater.

Table 4, below, displays the current intrawell UPL for each CCR Rule groundwater monitoring well south the UWL cells. As displayed in **Table 4**, the SSI values in TMW-1 and TMW-2 would not be an SSI at any other monitoring wells south of the UWL based on current intrawell UPLs. Therefore, since these calcium results at TMW-1 and TMW-2 are less than results at background monitoring wells and nearby monitoring wells, the SSIs are likely the result of a limited baseline sampling period that did not capture the full range of natural geochemical variability within the shallow zone of the alluvial aquifer.

Table 4 – Comparison of Intrawell UPLs for Calcium in Monitoring Well South of the UWL

Well ID	DG-1	DG-2	DG-3	DG-4	TMW-1	TMW-2	TMW-3	TMW-4	TMW-5	TMW-6
Current Calcium UPL (µg/L)	174,000	166,000	169,490	166,717	118,531	132,299	145,416	146,033	156,060	179,541

To further investigate the geochemical variability of calcium 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 8 occasions prior to the receipt of FGD in the SCPC and 25 occasions prior to the placement of CCR (fly ash and bottom ash) in the SCL4A. These DG-xx monitoring wells are screened at approximately the same depth as TMW-1 and TMW-2 in the shallow zone of the alluvial aquifer. **Figure 8** displays a box and whisker plot of the calcium 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 parametric UPL for calcium is 200,170 µg/L. As displayed in **Figure 8**, May 2024 and July 2024 sampling results at TMW-1 and TMW-2 are within the pre-CCR sampling results range for each DG-xx monitoring well and are well below the pre-CCR UPL.

Based on these data, the variability in calcium concentrations over time is not a result of CCR impacts from the SCL4A on the surrounding groundwater. The SSI is likely a result of geochemical variability of the aquifer, which is not captured by the limited dataset used for UPL calculation.

6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCL4A IMPACT

Based on the information presented in Section 5, the SSIs of chloride and calcium observed in May 2024 at TMW-1, TMW-2, and TMW-3 are not a result of impacts from the SCL4A. The SSIs appear to be a result of (1) pre-existing low concentrations of CCR indicators from the upgradient SCPA that predate the SCL4A, (2) relatively low calculated UPLs, (3) a relatively small set of baseline data that does not reflect the extent of natural temporal and spatial variability of groundwater chemistry within the aquifer, (4) a lack of elevated boron, a primary CCR impact indicator, in the monitoring wells with an SSI, and (5) the use of road salt (NaCl) during the construction of the SCPD and/or use on nearby roads.

Chloride concentrations at TMW-1 and TMW-3 are elevated compared to their intrawell UPLs; however, when compared to shallow background monitoring wells, the concentrations are similar to background results. Additionally, comparisons of chloride and sodium concentrations at SCL4A monitoring wells display that these two constituents are historically correlated, indicating that they are moving through the aquifer together. The recent spike in chloride and sodium is associated with deicing from the construction of the adjacent SCPD and/or road salt application on nearby roads.

At least 20 samples have been used to complete the calcium UPL calculations at TMW-1 and TMW-2. However, when the intrawell limits are compared to nearby monitoring wells south of the UWL and background wells, the limits at TMW-1 and TMW-2 are lower. Results from TMW-1 and TMW-2 during the May 2024 sampling event would not have been an SSI at any other well south of the UWL or if the results were compared to background results using an interwell statistical method. It can take many years to of data collection to capture the full range of variability in groundwater concentrations that are representative of natural conditions or pre-existing impacts for any given aquifer. Therefore, because calcium is not a typical CCR indicator parameter and boron is not elevated in the monitoring wells with an SSI, the SSIs observed at TMW-1 and TMW-2 are not caused by impacts from the SCL4A but rather are the result of natural variability of pre-existing calcium concentrations within the alluvial aquifer at the site.

Along with the lines of evidence listed above, SCL4A is documented to be properly constructed with 2 feet of low permeability compacted clay overlain by a 60-mil HDPE liner.

7.0 REFERENCES

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Tables

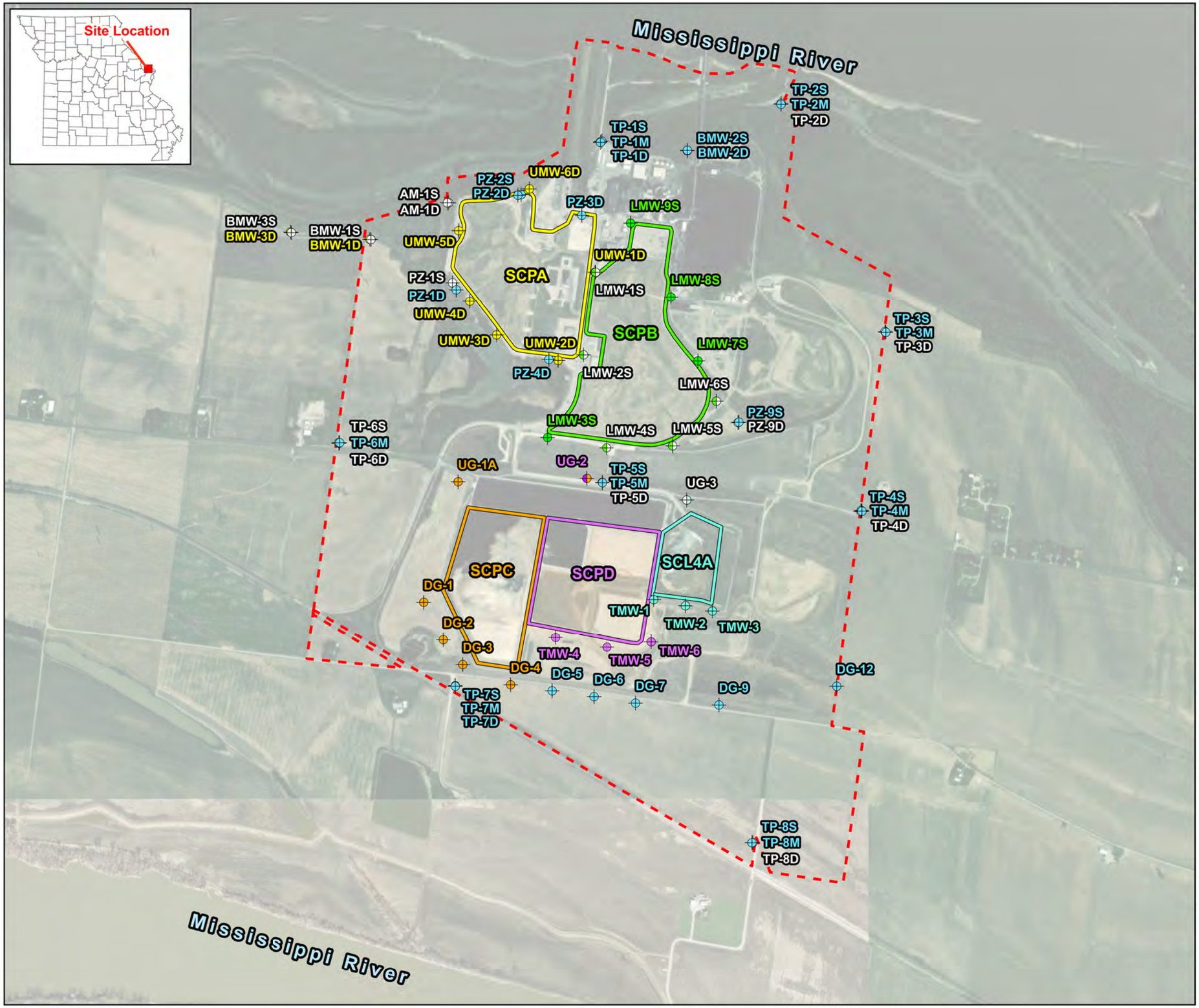
Table 1
May 2024 Detection Monitoring Results
SCL4A - Landfill Cell 4A
Sioux Energy Center, St. Charles County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1S	BMW-3S	Prediction Limit UG-3	UG-3	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
May 2024 Detection Monitoring Results											
DATE	NA	5/28/2024	5/28/2024	NA	5/28/2024	NA	5/30/2024	NA	5/29/2024	NA	5/29/2024
pH	SU	6.86	6.95	6.678-7.373	7.00	6.531-7.438	7.16	6.71-7.226	7.08	6.573-7.424	6.97
BORON, TOTAL	µg/L	58.1 J	54.1 J	1,105	345	DQR	85.5 J	101.4	84.0 J	109	56.8 J
CALCIUM, TOTAL	µg/L	133,000	116,000	171,791	129,000	118,531	124,000 J	132,299	135,000	145,416	113,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	84.34	28.0	4.359	12.8 J	4.531	4.0	3.383	14.2
FLUORIDE, TOTAL	mg/L	ND	ND	0.39	ND	0.4613	ND	0.4211	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	19.7	136.3	81.8	62.35	57.6 J	86.88	34.0 J	65.78	42.4
TOTAL DISSOLVED SOLIDS	mg/L	470	529	661.4	517	452.6	465	518	453	493	433
July 2024 Verification Sampling Event											
DATE	NA						7/29/2024		7/30/2024		7/30/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L						125,000 J		134,000		
CHLORIDE, TOTAL	mg/L						9.0 J				19.1
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L						440				

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. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
9. 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: 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

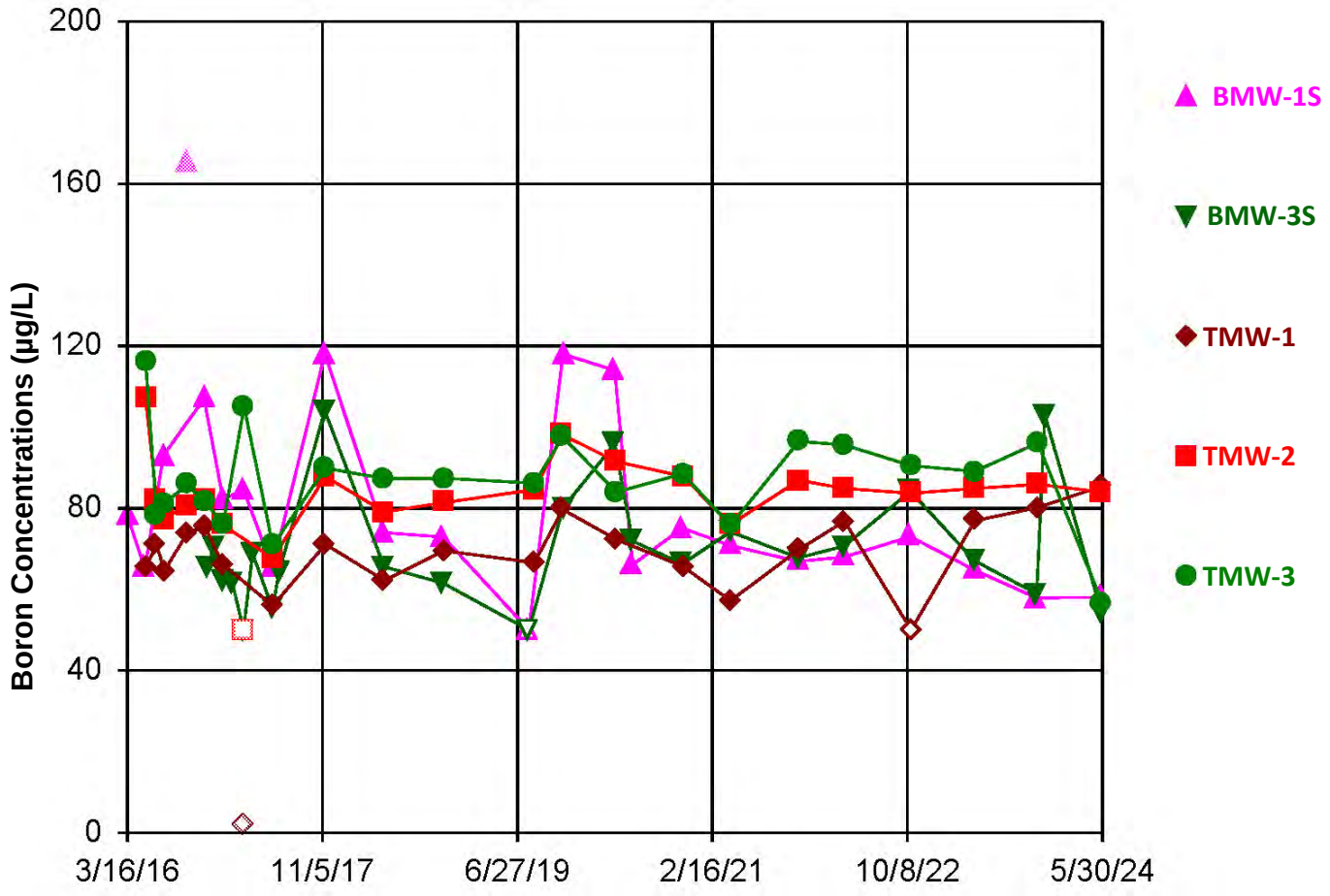
CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

Ameren

ROCKSMITH GEOENGINEERING

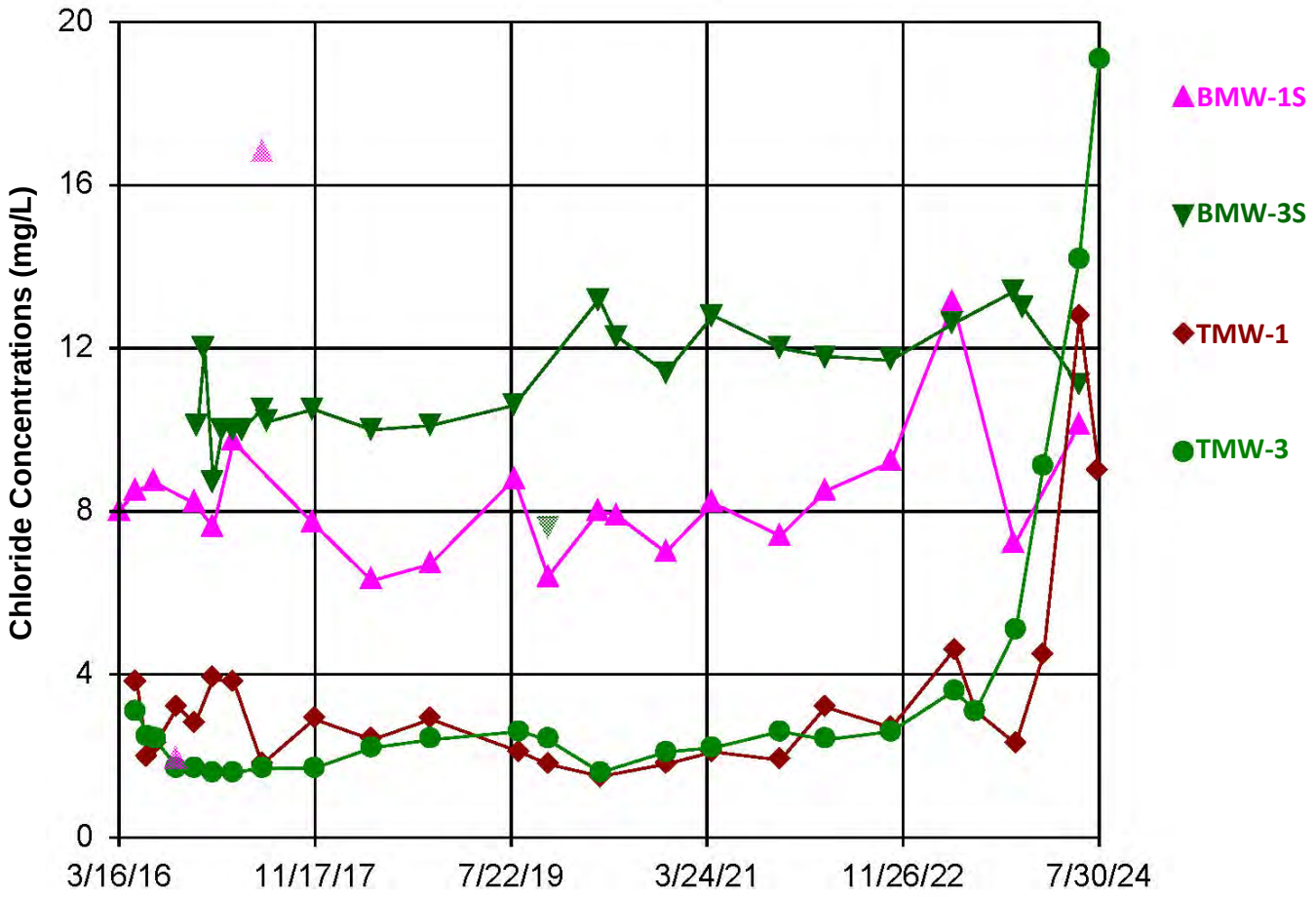
DESIGN	JSI	YYYY-MM-DD	2024-12-04
PREPARED	JSI	PROJECT No.	23009-24
REVIEW	GTM		
APPROVED	MNH		

FIGURE 1



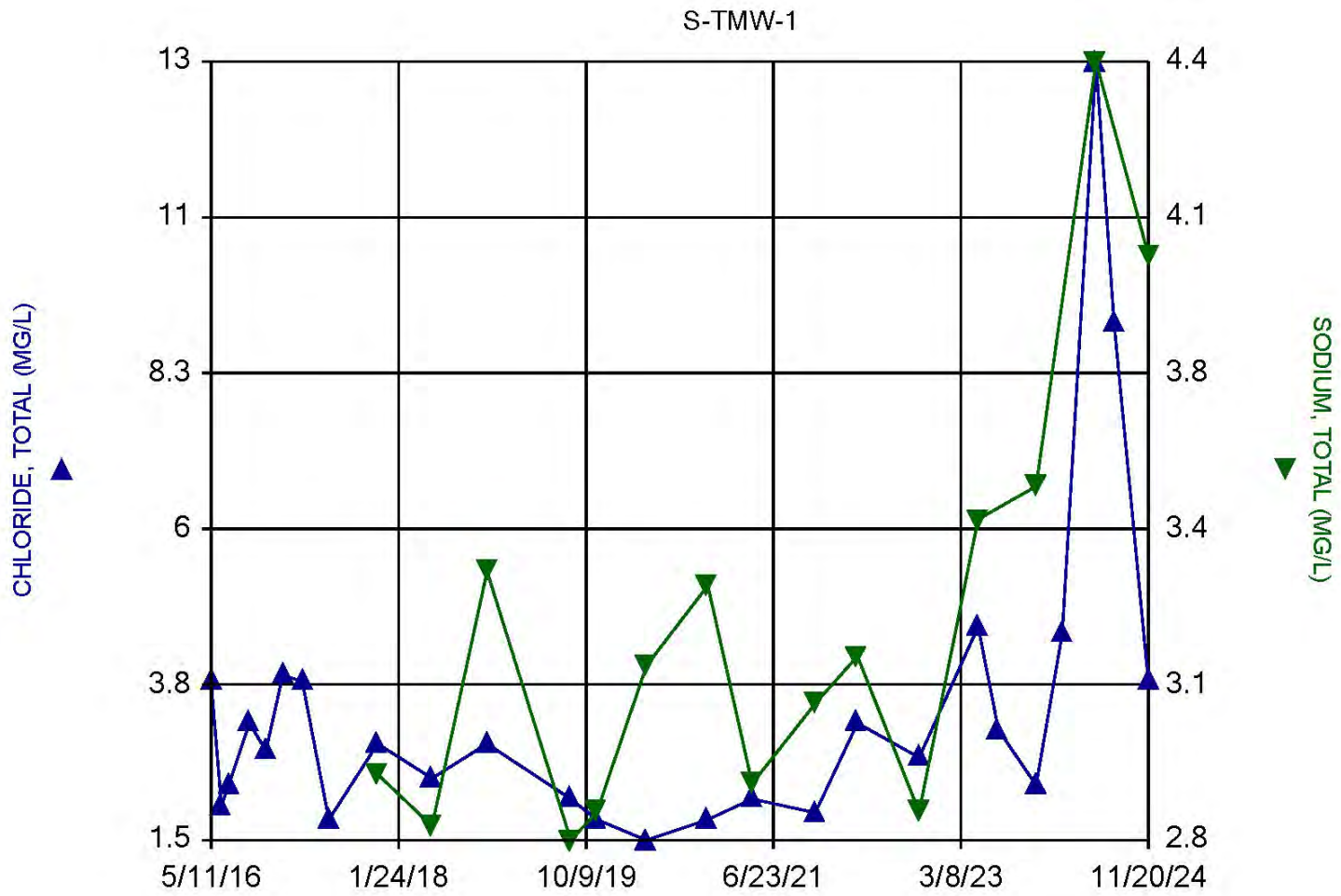
Notes
1) µg/L – Micrograms per liter.
2) Points not connected to lines are considered outliers as specified in the Updated Statistical Limit Technical Memorandum for the SCL4A.
3) Hollow symbols indicate non-detect values. Non-detects plotted as ½ the Method Detection Limit.

CLIENT/PROJECT					TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**					**Timeseries Plot of Boron Concentrations**		
DRAWN JSI	CHECKED GTM	REVIEWED MNHX	DATE 2024-12-30	ROCKSMITH GEOENGINEERING	Rev No. NA	JOB NO. 23009-24	FIGURE **2**



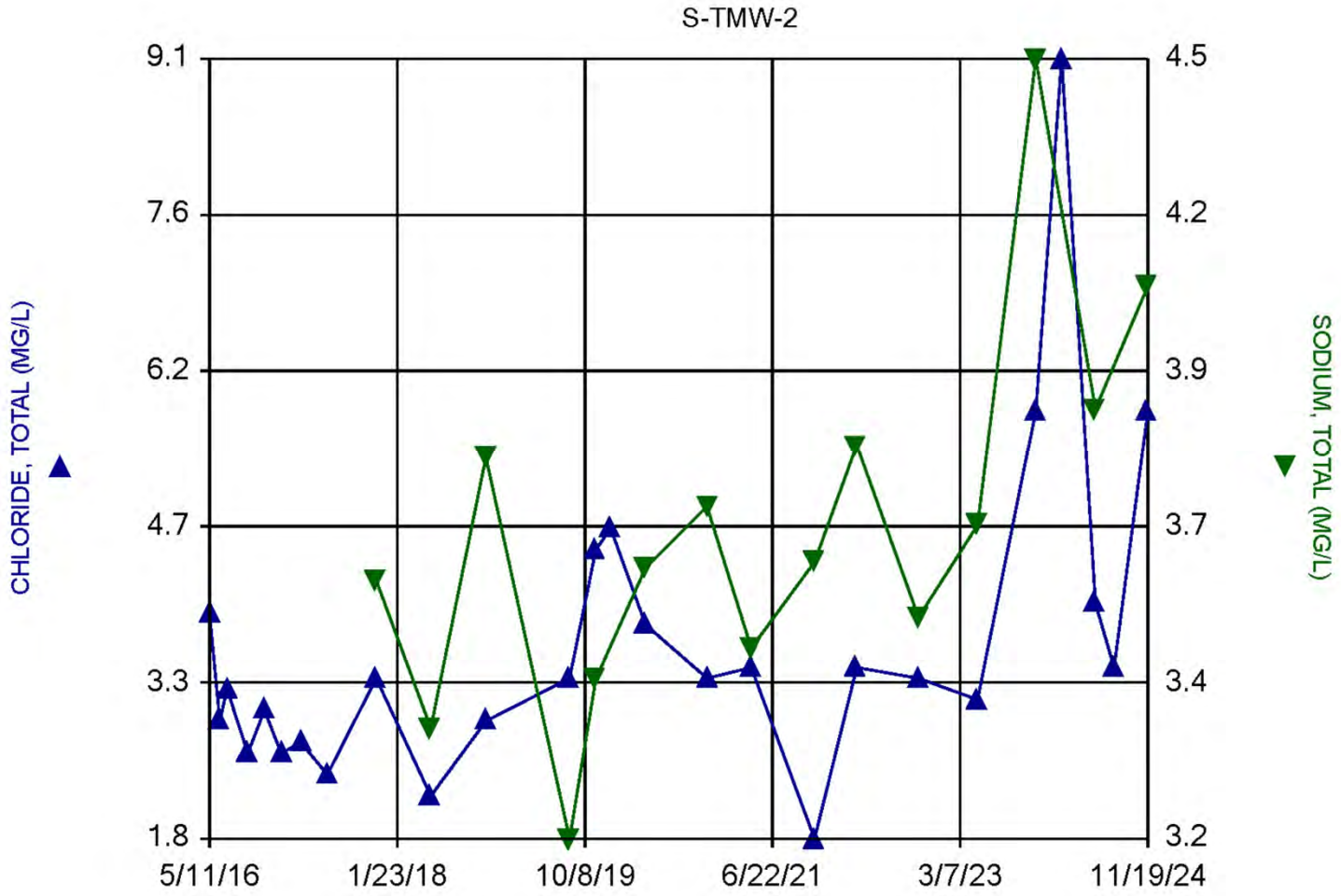
Notes
1) mg/L – Milligrams per liter.
2) Points not connected to lines are considered outliers as specified in the Updated Statistical Limit Technical Memorandum for the SCL4A.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Time Series Plot of Chloride Concentrations**		
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2024-12-30	Rev No. NA	JOB NO. 23009-24	FIGURE **3**



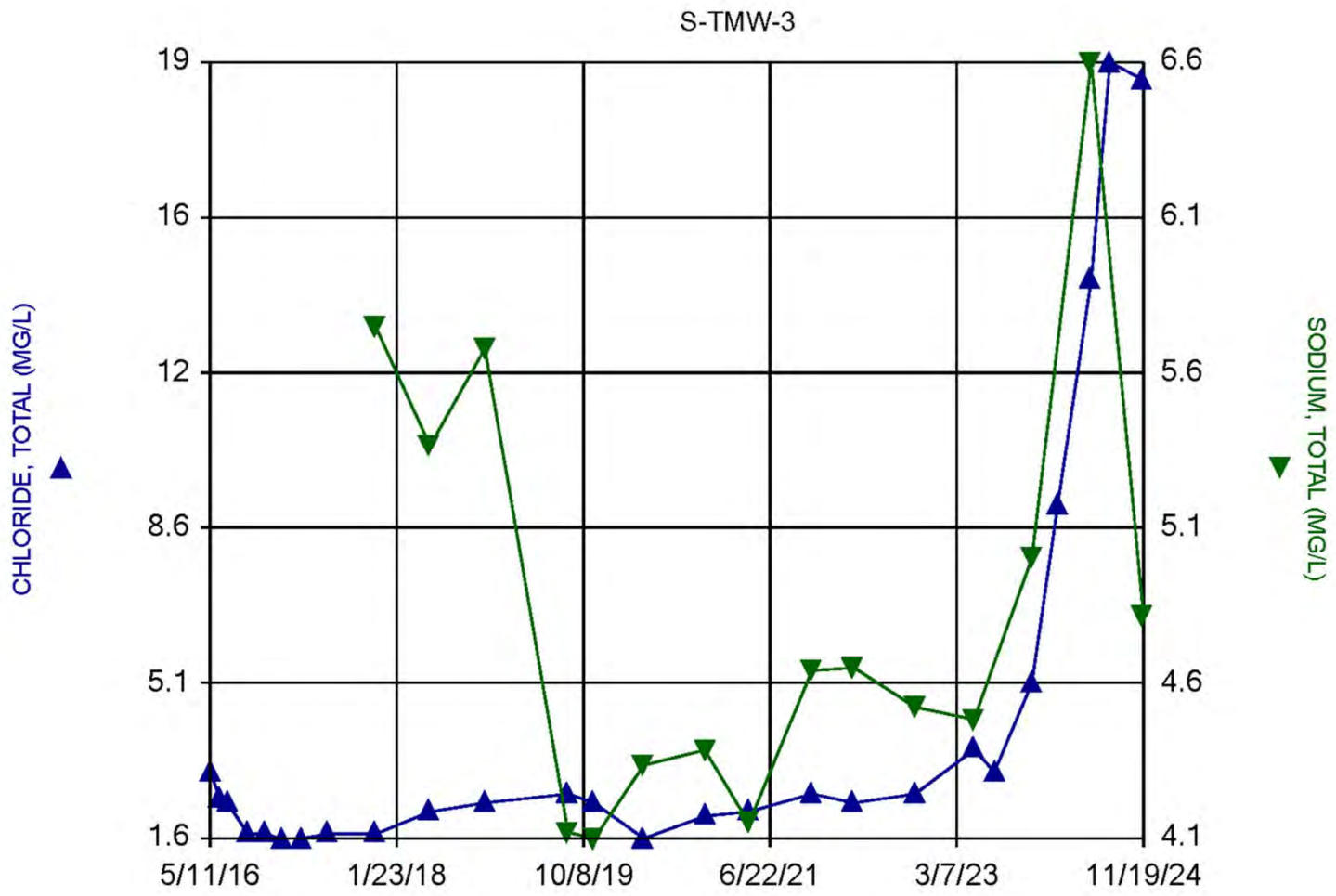
Notes
1) mg/L – Milligrams per liter.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Time Series Plot of Chloride and Sodium Concentrations – TMW-1**		
DRAWN	CHECKED	REVIEWED	DATE	Rev No.	JOB NO.	FIGURE
JSI	GTM	MNH	2024-12-30	NA	23009-24	**4**



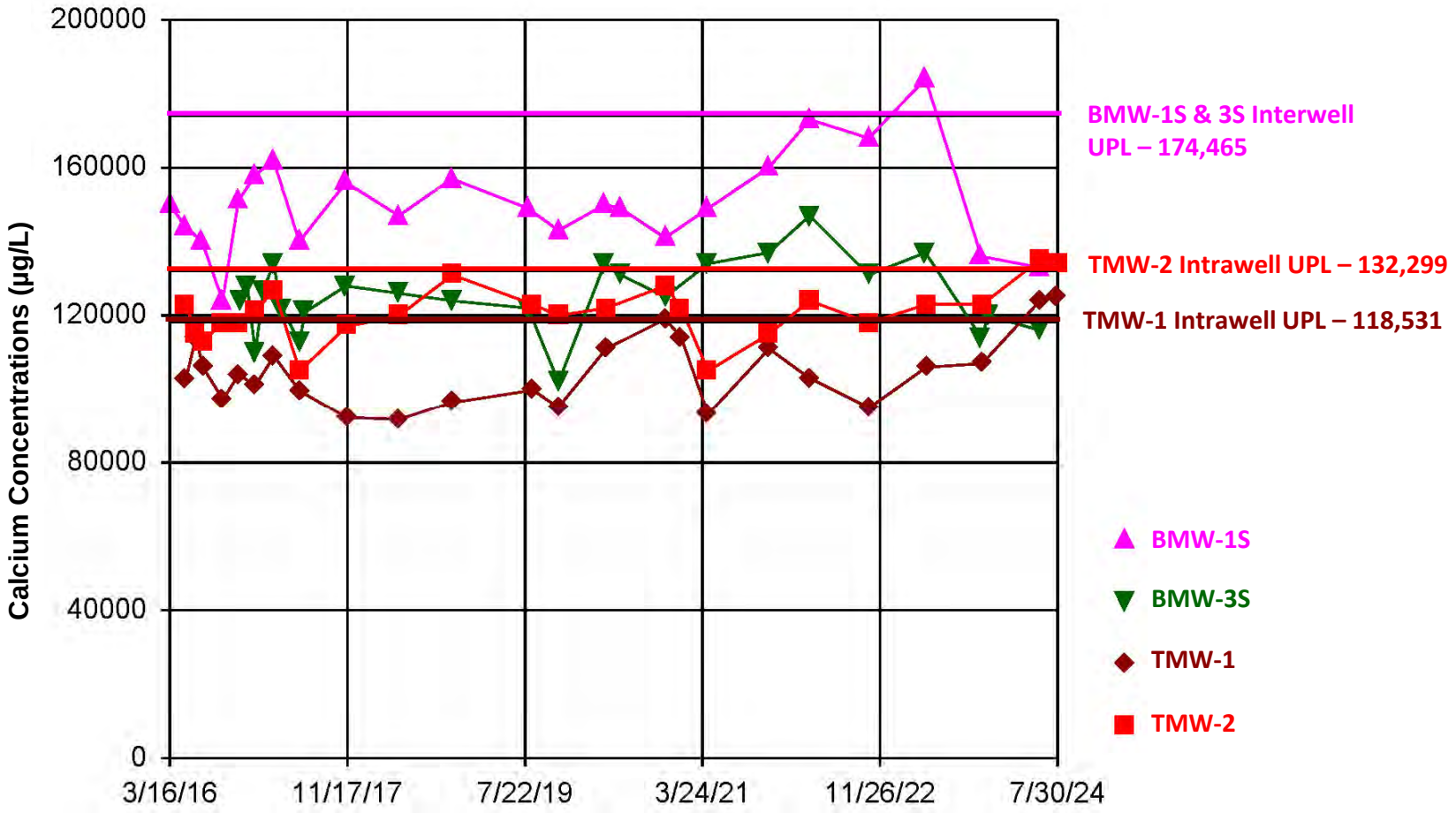
Notes
1) mg/L – Milligrams per liter.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Time Series Plot of Chloride and Sodium Concentrations – TMW-2**		
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2024-12-30	Rev No. NA	JOB NO. 23009-24	FIGURE **5**



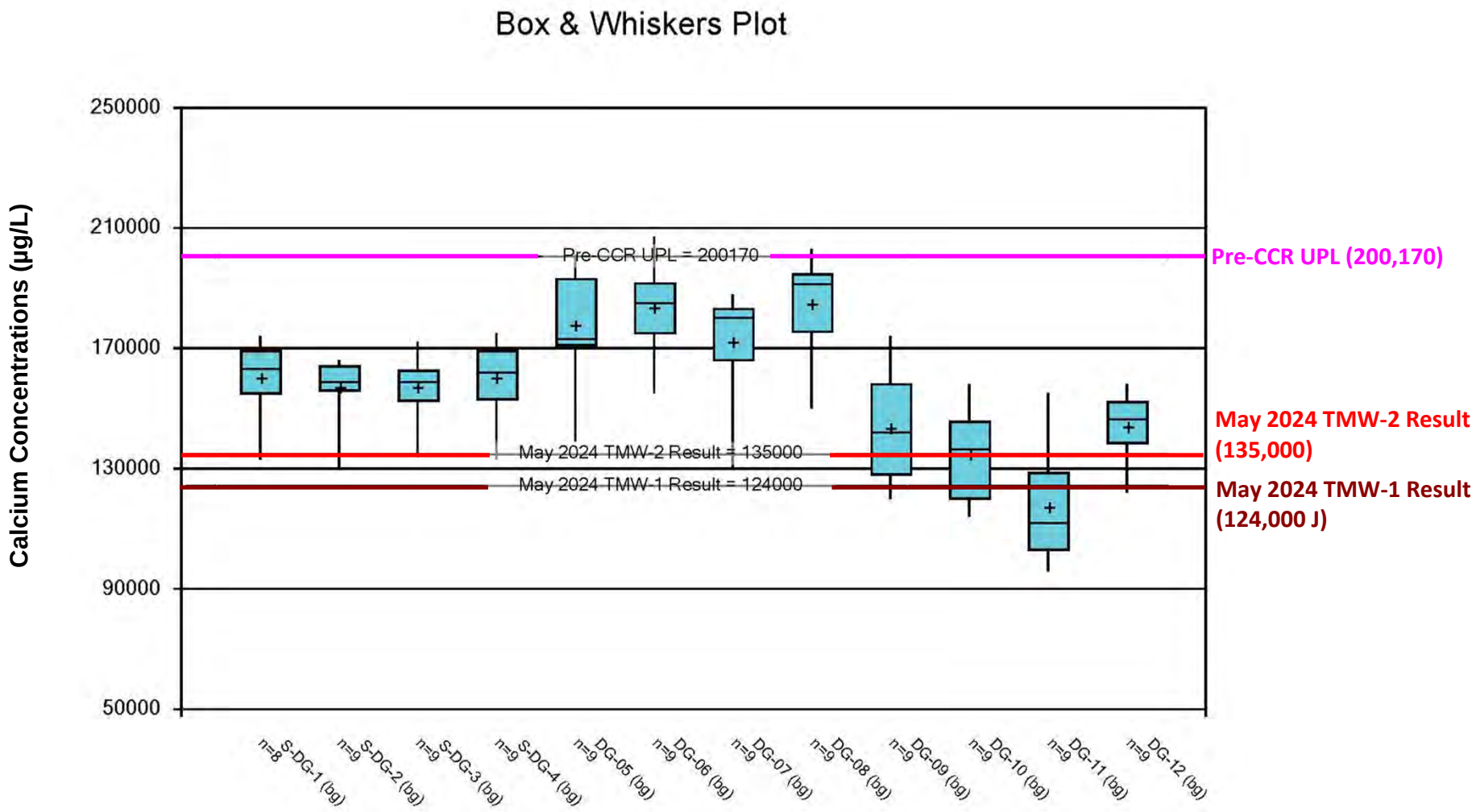
Notes
1) mg/L – Milligrams per liter.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Time Series Plot of Chloride and Sodium Concentrations – TMW-3**		
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2024-12-30	Rev No. NA	JOB NO. 23009-24	FIGURE **6**



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.

CLIENT/PROJECT				TITLE		
AMEREN MISSOURI SIOUX ENERGY CENTER				Time Series Plot of Calcium Concentrations		
DRAWN JSI	CHECKED GTM	REVIEWED MNH	DATE 2024-12-30	Rev No. NA	JOB NO. 23009-24	FIGURE 7



Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) CCR – Coal Combustion Residuals.
4) UWL – Utility Waste Landfill.

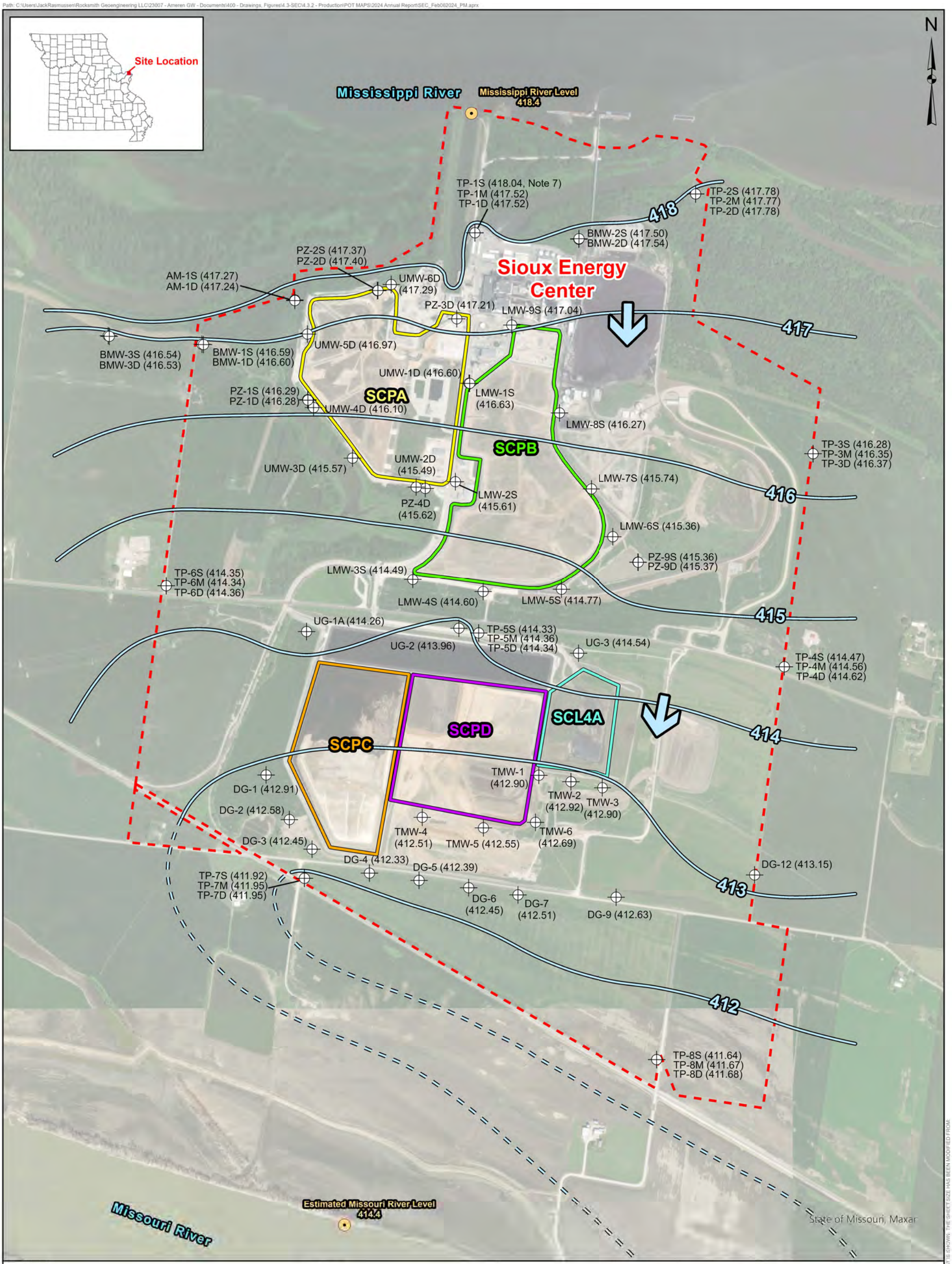
CLIENT/PROJECT				TITLE
AMEREN MISSOURI **SIOUX ENERGY CENTER**				**Pre-CCR Calcium Plots – Downgradient UWL Monitoring Wells**
DRAWN	CHECKED	REVIEWED	DATE	Rev No. / JOB NO. / FIGURE
JSI	GTM	MNH	2024-12-30	NA / 23009-24 / **8**

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

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- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

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- Monitoring Well or Piezometer
- Groundwater Flow Direction

NOTES

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3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
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6.) FGD - FLUE GAS DESULFURIZATION.

REFERENCES

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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

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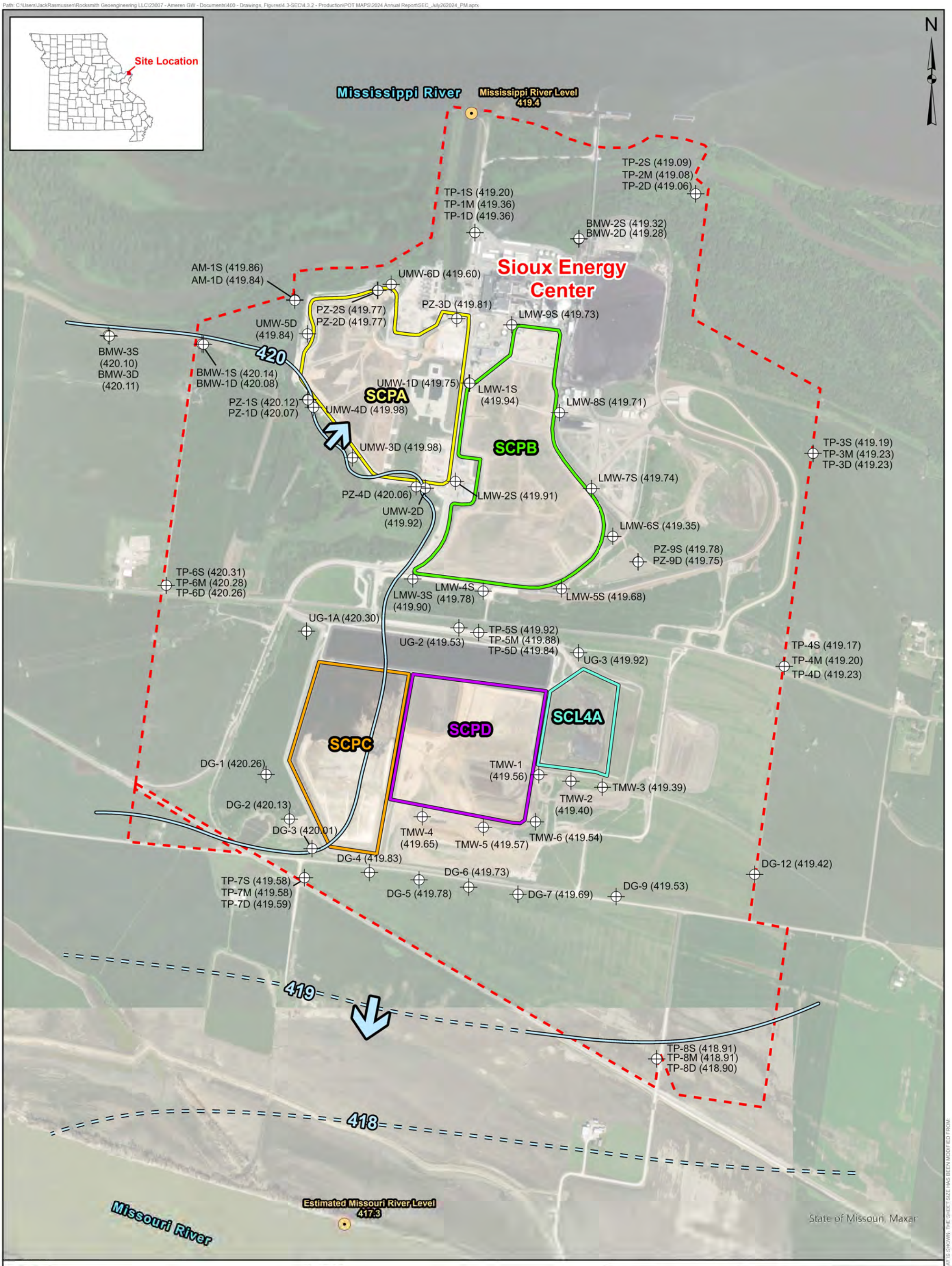

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6.) FGD - FLUE GAS DESULFURIZATION.

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
JULY 26, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

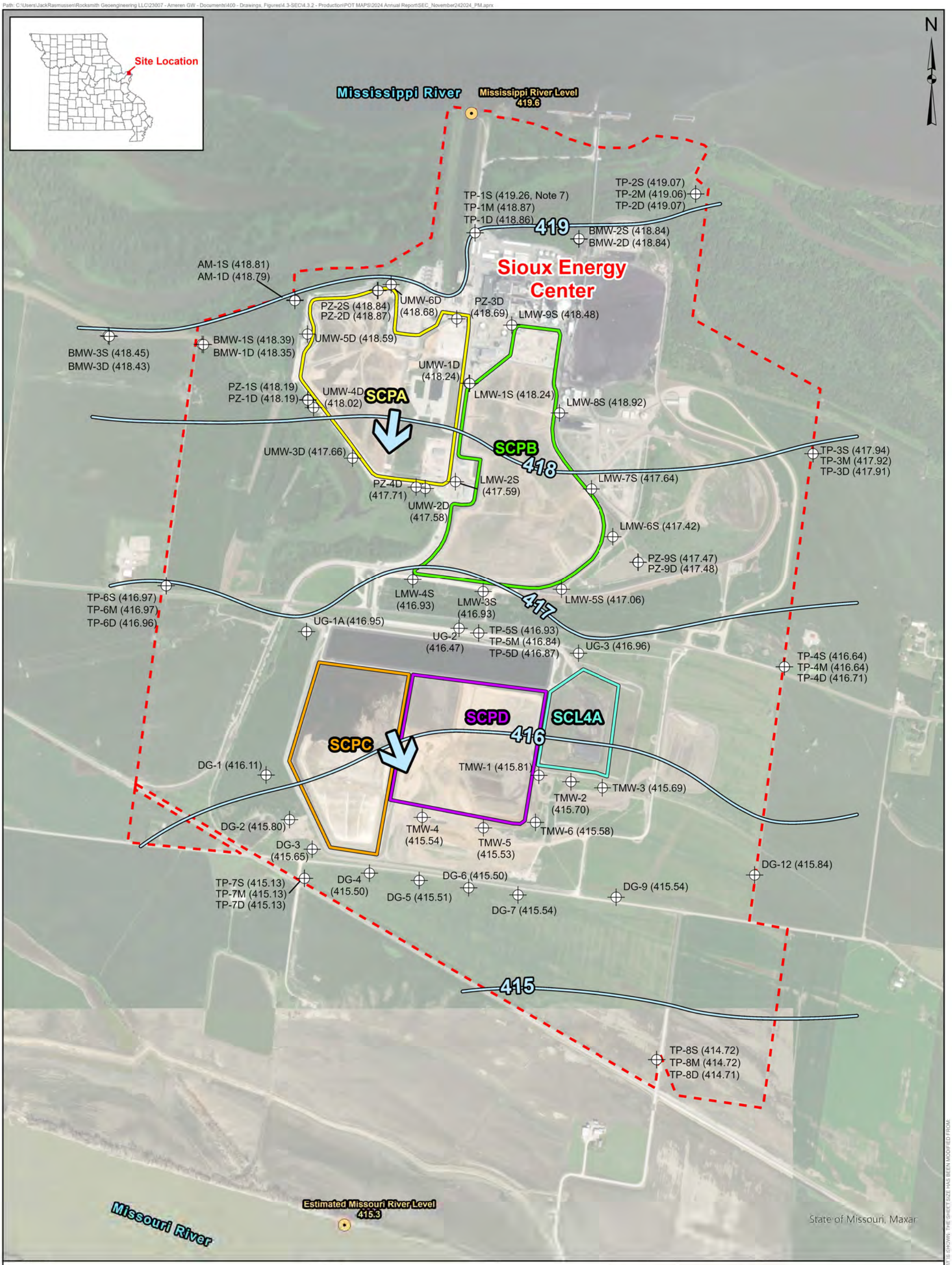
ROCKSMITH GEOENGINEERING

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
- 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
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