

REPORT

2024 Annual Groundwater Monitoring and Corrective Action Report

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

January 31, 2025

Project Number: 23009-24

Submitted to:



Ameren Missouri
1901 Chouteau Avenue
St. Louis, Missouri 63103

Submitted by:



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



EXECUTIVE SUMMARY AND STATUS OF THE SCPD 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 SCPD Coal Combustion Residuals (CCR) Surface Impoundment at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCPD describes CCR Rule groundwater monitoring activities from January 1, 2024 through December 31, 2024.

The SCPD began receiving CCR waste on December 14, 2022. Throughout 2024, the SCPD CCR unit has been operating under the Detection Monitoring Program (§257.94), with the first Detection Monitoring sampling event beginning on May 2, 2023. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. SSIs were determined during each sampling event in 2024, and a summary of the SSIs for the past year is provided in **Table 1**.

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

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt	Parameters Collected	Verified SSIs	SSI Determination Date	ASD Completion Date
November 2023 Sampling Event	Detection Monitoring, November 10-13, 2023	December 27, 2023	Appendix III, Major Cations and Anions	Boron: UG-2 Sulfate: TMW-5	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 28-29, 2024	July 9, 2024	Appendix III, Major Cations and Anions	Chloride: TMW-6 Sulfate: TMW-4, TMW-5	October 7, 2024	January 3, 2025
	Verification Sampling, July 29, 2024	August 12, 2024	Detected Appendix III parameters			
November 2024 Sampling Event	Detection Monitoring, November 14-20, 2024	December 24, 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 sampling event and are discussed further in this Annual Report.

There were no changes made to the monitoring system in 2024 with no new wells being installed or decommissioned.

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1.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPD. The groundwater monitoring system consists of six groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1** and is listed on **Table 2**, below. No new monitoring wells were installed or decommissioned in 2024 as a part of the CCR Rule monitoring program for the SCPD. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the SCPD.

2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCPD 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-2	TMW-4	TMW-5	TMW-6	
	Date of Sample Collection						
February 2024 Verification Sampling	-	-	2/7/2024	-	2/7/2024	-	Detection
May 2024 Sampling Event	5/28/2024	5/28/2024	5/28/2024	5/29/2024	5/29/2024	5/29/2024	Detection
July 2024 Verification Sampling	-	-	-	7/29/2024	7/29/2024	7/29/2024	Detection
November 2024 Sampling Event	11/20/2024	11/20/2024	11/14/2024	11/19/2024	11/19/2024	11/19/2024	Detection
Total Number of Samples Collected	2	2	3	3	4	3	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.

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 the report. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed 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 2024 sampling events are provided in **Appendix A**. Laboratory Analytical data for the November 2023 Detection Monitoring event are provided in the 2023 Annual Report for the SCPD.

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 November 2023 SSIs and is provided in **Appendix B**. This ASD demonstrates that the SSIs at monitoring wells UG-2 and TMW-5 are not caused by the SCPD CCR Unit, and therefore, the SCPD CCR Unit remains in Detection Monitoring.

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

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

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

2.3 Sampling Issues

No notable sampling issues were encountered at the SCPD 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.

Tables

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

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
November 2023 Detection Monitoring Event											
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.29 - 7.5	7.10	6.585-7.26	7.06	6.642-7.223	6.95	6.59-7.093	6.95
BORON, TOTAL	µg/L	57.9 J	58.9 J	277.7	1,700	122.2	93.7 J	116.0	93.3 J	131.8	120
CALCIUM, TOTAL	µg/L	136,000	114,000	143,772	119,000	146,033	117,000 J	156,060	132,000	179,541	134,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	93.74	12.9 J	3.216	2.0 J	2.435	1.4 J	11.02	2.0 J
FLUORIDE, TOTAL	mg/L	ND	ND	0.34	ND	0.48	ND	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	46.9	12.3	93.63	0.79 J	44.43	44.3 J	46.12	50.0 J	51.85	36.0 J
TOTAL DISSOLVED SOLIDS	mg/L	475	398	657.3	483	571	451	600.6	516	719.8	542
February 2024 Verification Sampling Event											
DATE	NA				2/7/2024				2/7/2024		
pH	SU										
BORON, TOTAL	µg/L				1,360						
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								72.8		
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. 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
SCPD Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
May 2024 Detection Monitoring Event											
DATE	NA	5/28/2024	5/28/2024	NA	5/28/2024	NA	5/29/2024	NA	5/29/2024	NA	5/29/2024
pH	SU	6.86	6.95	6.29 - 7.50	7.04	6.585-7.26	7.16	6.642-7.223	7.02	6.59-7.093	6.88
BORON, TOTAL	µg/L	58.1 J	54.1 J	277.7	143	122.2	74.9 J	116.0	81.3 J	131.8	93.5 J
CALCIUM, TOTAL	µg/L	133,000	116,000	143,772	87,100	146,033	96,800	156,060	109,000	179,541	143,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	93.74	6.7	3.216	2.1 J	2.435	1.6	11.02	16.5
FLUORIDE, TOTAL	mg/L	ND	ND	0.34	ND	0.48	0.16 J	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	19.7	93.63	35.8	44.43	73.9 J	46.12	72.1	51.85	45.8
TOTAL DISSOLVED SOLIDS	mg/L	470	529	657.3	335	571	381	600.6	403	719.8	499
July 2024 Verification Sampling Event											
DATE	NA						7/29/2024		7/29/2024		7/29/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										28.2 J
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L						69.2 J		64.6		
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. 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

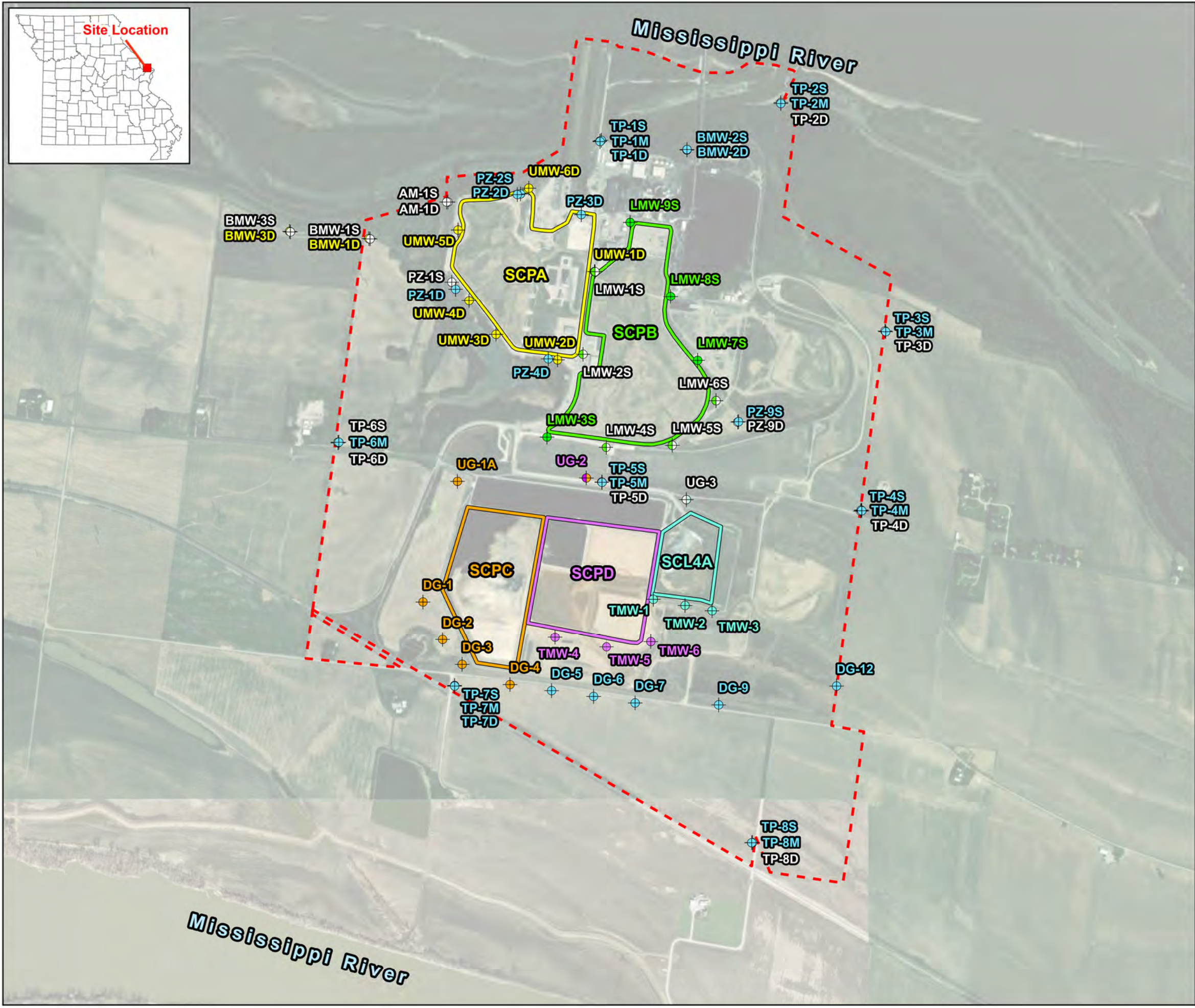
Table 5
November 2024 Detection Monitoring Results
SCPD Surface Impoundment
Sioux Energy Center, St. Charles County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS			
ANALYTE	UNITS	BMW-1S	BMW-3S	UG-2	TMW-4	TMW-5	TMW-6
November 2024 Detection Monitoring Event							
DATE	NA	11/20/2024	11/20/2024	11/14/2024	11/19/2024	11/19/2024	11/19/2024
pH	SU	6.57	6.72	7.08	7.07	6.91	6.63
BORON, TOTAL	µg/L	61.9 J	57.3 J	112	100	72.5 J	106
CALCIUM, TOTAL	µg/L	175,000	113,000	90,800	116,000	99,800	133,000
CHLORIDE, TOTAL	mg/L	14.2	13.1	26.5	2.4	1.5	5.1
FLUORIDE, TOTAL	mg/L	ND	ND	0.29	0.43	0.40 J	0.30 J
SULFATE, TOTAL	mg/L	37.1	17.1	29.4	58.1	83.9	44.5
TOTAL DISSOLVED SOLIDS	mg/L	613	413	409	484	405	556

- 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

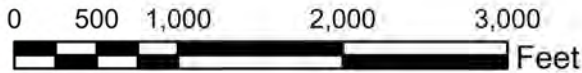


SIoux ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

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

- REFERENCES**
- Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.



PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIoux ENERGY CENTER



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



February 23, 2024

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

RE: Project: AMEREN SCPD-VERIFICATION SAMP.
Pace Project No.: 60446940

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,

A handwritten signature in cursive script, reading "Jamie Church".

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

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CERTIFICATIONS

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

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

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SAMPLE SUMMARY

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60446940001	S-TMW-5	Water	02/07/24 14:50	02/09/24 05:30
60446940002	S-SCPD-DUP-1	Water	02/07/24 00:00	02/09/24 05:30
60446940003	S-SCPD-FB-1	Water	02/07/24 09:08	02/09/24 05:30
60446937001	S-UG-2	Water	02/07/24 09:10	02/09/24 05:30

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60446940001	S-TMW-5	EPA 200.7	JXD	1	PASI-K
		EPA 300.0	PL	1	PASI-K
60446940002	S-SCPD-DUP-1	EPA 200.7	JXD	1	PASI-K
		EPA 300.0	RKA	1	PASI-K
60446940003	S-SCPD-FB-1	EPA 200.7	JXD	1	PASI-K
		EPA 300.0	RKA	1	PASI-K
60446937001	S-UG-2	EPA 200.7	JXD	1	PASI-K
		SM 2540C	KVI	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Sample: S-TMW-5		Lab ID: 60446940001		Collected: 02/07/24 14:50		Received: 02/09/24 05:30		Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City							
Boron	85.3J	ug/L	100	6.4	1	02/14/24 10:28	02/16/24 15:05	7440-42-8	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City							
Sulfate	72.8	mg/L	10.0	5.5	10		02/22/24 23:16	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Sample: S-SCPD-DUP-1		Lab ID: 60446940002		Collected: 02/07/24 00:00		Received: 02/09/24 05:30		Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City							
Boron	1260	ug/L	100	6.4	1	02/14/24 10:28	02/16/24 15:11	7440-42-8	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City							
Sulfate	74.6	mg/L	10.0	5.5	10		02/21/24 17:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Sample: S-SCPD-FB-1		Lab ID: 60446940003		Collected: 02/07/24 09:08		Received: 02/09/24 05:30		Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City							
Boron	<6.4	ug/L	100	6.4	1	02/14/24 10:28	02/16/24 15:19	7440-42-8	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City							
Sulfate	0.75J	mg/L	1.0	0.55	1		02/21/24 17:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Sample: S-UG-2		Lab ID: 60446937001		Collected: 02/07/24 09:10		Received: 02/09/24 05:30		Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City							
Boron	1360	ug/L	100	6.4	1	02/16/24 12:01	02/20/24 09:32	7440-42-8	
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	511	mg/L	10.0	10.0	1		02/12/24 11:06		AB

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

QC Batch: 883188

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60446940001, 60446940002, 60446940003

METHOD BLANK: 3496094

Matrix: Water

Associated Lab Samples: 60446940001, 60446940002, 60446940003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<6.4	100	6.4	02/16/24 14:55	

LABORATORY CONTROL SAMPLE: 3496095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	957	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3496096 3496097

Parameter	Units	60446940001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	85.3J	1000	1000	1010	1030	92	95	70-130	3	20	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

QC Batch: 883490

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60446937001

METHOD BLANK: 3497213

Matrix: Water

Associated Lab Samples: 60446937001

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

LABORATORY CONTROL SAMPLE: 3497214

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3497215 3497216

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3497217 3497218

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

MATRIX SPIKE SAMPLE: 3497219

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

QC Batch:	882943	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60446937001

METHOD BLANK: 3495313 Matrix: Water

Associated Lab Samples: 60446937001

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

LABORATORY CONTROL SAMPLE: 3495314

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

SAMPLE DUPLICATE: 3495315

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

SAMPLE DUPLICATE: 3495316

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

QC Batch:	883836	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60446940001, 60446940002, 60446940003

METHOD BLANK: 3498689 Matrix: Water

Associated Lab Samples: 60446940001, 60446940002, 60446940003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
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
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
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
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
Sulfate	mg/L	72.8	50	50	122	121	98	97	80-120	1	15	

SAMPLE DUPLICATE: 3498693

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

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

SAMPLE DUPLICATE: 3498696

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

SAMPLE DUPLICATE: 3498699

Parameter	Units	60446940001 Result	Dup Result	RPD	Max RPD	Qualifiers
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 SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

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

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

AB Analyte was detected in an associated instrument blank.

D6 The precision between the sample and sample duplicate exceeded laboratory control limits.

MW Due to matrix interference, achieving a constant weight is not possible.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD-VERIFICATION SAMP.

Pace Project No.: 60446940

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60446937001	S-UG-2	EPA 200.7	883490	EPA 200.7	883506
60446940001	S-TMW-5	EPA 200.7	883188	EPA 200.7	883207
60446940002	S-SCPD-DUP-1	EPA 200.7	883188	EPA 200.7	883207
60446940003	S-SCPD-FB-1	EPA 200.7	883188	EPA 200.7	883207
60446937001	S-UG-2	SM 2540C	882943		
60446940001	S-TMW-5	EPA 300.0	883836		
60446940002	S-SCPD-DUP-1	EPA 300.0	883836		
60446940003	S-SCPD-FB-1	EPA 300.0	883836		

REPORT OF LABORATORY ANALYSIS

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WO#: 60446940



DC#_Title: ENV-FRM-LENE-0009_Sample C

Revision: 2

Effective Date: 01/12/2022

Issued By: Lenexa

Client Name: Rocks with 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 1-2/15 Corr. Factor -0.3 Corrected 0.9/1.2

Date and initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____

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:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Rocksmith Geoeengineering, LLC	Report To:	Mark Haddock	Attention:	
Address:	5233 Roanoke Drive St. Charles, MO 63304	Copy To:	Jeffery Ingram, Grant Morey	Company Name:	Rocksmith
Email To:	mark.haddock@rocksmithgeo.com	Purchase Order No.:	COC #3	Address:	
Phone:	314-974-5678	Project Name:	Ameren SCPD - Verification Sampling	Pace Quote Reference:	
Requested Due Date/TAT:	Standard	Project Number:	COC#3	Pace Project Manager:	Jamie Church
				Pace Profile #:	15856, line 1

Page: 1 of 1

REGULATORY AGENCY	
<input type="checkbox"/> NPDES	<input checked="" type="checkbox"/> GROUND WATER
<input type="checkbox"/> UST	<input type="checkbox"/> RCRA
<input type="checkbox"/> OTHER	
Site Location	MO
STATE:	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DW DRINKING WATER WT WASTE WATER WW WASTE WATER P PRODUCT SL SOLID OL OIL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED			SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives										Analysis Test ↑	Y/N ↑	Requested Analysis Filtered (Y/N)										Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
					COMPOSITE START	COMPOSITE END/GRAB	DATE			TIME	DATE	TIME	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃	Methanol			Other	Boron	Sulfate	N	N	N	N	N	N	N			N	N	N																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		SAMPLE CONDITIONS	
	DATE	TIME	DATE	TIME	RECEIVED ON	TEMP IN °C
Grant Morey / Rocksmith	2-8-24	1340	Grant Morey	2/9 0530	1.2	
					0.9	

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on	Custody Cooler	Samples Intact
PRINT Name of SAMPLER:	Grant Morey				
SIGNATURE of SAMPLER:	Grant Morey				
DATE Signed (MM/DD/YYYY):					
02/08/24					

Client: Rocksmith

Site: Ameren SCPD

Profile #

15856-1

Notes

Do not log line 1

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																													
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

Container Codes

Container Codes

Glass		Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1C	1L NaOH plastic
DG9H	40mL HCl amber vial	WGFU	4oz clear soil jar	BP1N	1L HNO3 plastic
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2C	500mL NaOH plastic
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3C	250mL NaOH plastic
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate
				BP4U	125mL unpreserved plastic
				BP4N	125mL HNO3 plastic
				BP4S	125mL H2SO4 plastic
				WPDU	16oz unpreserved plastic

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

Work Order Number:

60446940



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 – SCPD Verification – Data Package 60446940**

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 Name: Ameren SCPD Verification
Reviewer: G. Morey

Project Manager: J. Ingram
Project Number: 23009
Validation Date: 3/19/2024

Laboratory: Pace Analytical

SDG #: 60446940

Analytical Method (type and no.): EPA 200.7 (Boron); EPA 300.0 (Sulfate); SM 2540C (Total Dissolved Solids)

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____

Sample Names S-TMW-5, S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2

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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>2/7/2024</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>ANT/GTM</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>_____</u>
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Spec Cond, Turb, Temp, DO, ORP</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>No lab narrative.</u>
Note Deficiencies: <u>_____</u>				
<u>_____</u>				
<u>_____</u>				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See notes
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See notes
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S-SCPD-DUP-1 @ S-UG-2
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See notes
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Comments/Notes:

General:

Dilutions noted in some samples for sulfate, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

3495313: TDS detected in method blank (31.5). Associated with sample -001. Result > RL and 10x blank, no qualification necessary.

Field Blank:

S-SCPD-FB-1 @ S-UG-2: Sulfate (0.75J). Sulfate not analyzed in parent sample, no qualification necessary.

Lab Duplicate:

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

Lab duplicate max RPD: 10%: TDS

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

[illegible]

Signature: Grant Morey

Date: 3/19/2024



July 09, 2024

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

RE: Project: AMEREN SCPD
Pace Project No.: 60453819

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on May 30, 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,

A handwritten signature in blue ink, reading "Jamie Church".

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

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CERTIFICATIONS

Project: AMEREN SCPD

Pace Project No.: 60453819

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

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SAMPLE SUMMARY

Project: AMEREN SCPD

Pace Project No.: 60453819

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60453819001	S-TMW-4	Water	05/29/24 09:13	05/30/24 05:35
60453819002	S-TMW-5	Water	05/29/24 10:08	05/30/24 05:35
60453819003	S-TMW-6	Water	05/29/24 11:20	05/30/24 05:35
60453819004	S-SCPD-DUP-1	Water	05/29/24 00:00	05/30/24 05:35
60453819005	S-SCPD-FB-1	Water	05/29/24 11:15	05/30/24 05:35
60453817001	S-UG-2	Water	05/28/24 13:25	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

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD

Pace Project No.: 60453819

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60453819001	S-TMW-4	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
60453819002	S-TMW-5	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
60453819003	S-TMW-6	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
60453819004	S-SCPD-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
60453819005	S-SCPD-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
60453817001	S-UG-2	EPA 200.7	JXD	7	PASI-K
		SM 2320B	SR1	1	PASI-K
		SM 2540C	KVI	1	PASI-K
		EPA 300.0	PL	3	PASI-K
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 SCPD

Pace Project No.: 60453819

Sample: S-TMW-4 Lab ID: 60453819001 Collected: 05/29/24 09:13 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	74.9J	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:07	7440-42-8	M1
Calcium	96800	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:07	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:07	7439-89-6	
Magnesium	22000	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:07	7439-95-4	
Manganese	425	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:07	7439-96-5	
Potassium	4930	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:07	7440-09-7	
Sodium	3830	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:07	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	276	mg/L	20.0	10.5	1		06/07/24 14:10		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	381	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	2.1	mg/L	1.0	0.53	1		06/12/24 16:48	16887-00-6	M1
Fluoride	0.16J	mg/L	0.20	0.12	1		06/12/24 16:48	16984-48-8	M1,N2
Sulfate	73.9	mg/L	10.0	5.5	10		06/12/24 17:47	14808-79-8	M1

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

Sample: S-TMW-5 Lab ID: 60453819002 Collected: 05/29/24 10:08 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	81.3J	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:18	7440-42-8	
Calcium	109000	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:18	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:18	7439-89-6	
Magnesium	20500	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:18	7439-95-4	
Manganese	493	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:18	7439-96-5	
Potassium	5130	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:18	7440-09-7	
Sodium	3980	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:18	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	302	mg/L	20.0	10.5	1		06/08/24 14:36		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	403	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	1.6	mg/L	1.0	0.53	1		06/12/24 19:16	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/12/24 19:16	16984-48-8	N2
Sulfate	72.1	mg/L	10.0	5.5	10		06/12/24 19:31	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

Sample: S-TMW-6 Lab ID: 60453819003 Collected: 05/29/24 11:20 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	<6.4	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:20	7440-42-8	
Calcium	<26.9	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:20	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:20	7439-89-6	
Magnesium	<20.1	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:20	7439-95-4	
Manganese	<0.39	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:20	7439-96-5	
Potassium	93.5J	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:20	7440-09-7	B
Sodium	194J	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:20	7440-23-5	B
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	433	mg/L	20.0	10.5	1		06/08/24 14:42		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	499	mg/L	10.0	10.0	1		06/04/24 12:50		
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Kansas City									
Chloride	16.5	mg/L	1.0	0.53	1		06/12/24 19:46	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/12/24 19:46	16984-48-8	N2
Sulfate	45.8	mg/L	10.0	5.5	10		06/12/24 20:01	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

Sample: S-SCPD-DUP-1 Lab ID: 60453819004 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	78.6J	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:22	7440-42-8	
Calcium	107000	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:22	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:22	7439-89-6	
Magnesium	20100	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:22	7439-95-4	
Manganese	470	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:22	7439-96-5	
Potassium	4990	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:22	7440-09-7	
Sodium	3860	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:22	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	300	mg/L	20.0	10.5	1		06/08/24 14:48		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	389	mg/L	10.0	10.0	1		06/04/24 12:50		
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Kansas City									
Chloride	1.5	mg/L	1.0	0.53	1		06/12/24 20:16	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/12/24 20:16	16984-48-8	N2
Sulfate	75.3	mg/L	10.0	5.5	10		06/12/24 20:30	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

Sample: S-SCPD-FB-1 Lab ID: 60453819005 Collected: 05/29/24 11:15 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	93.5J	ug/L	100	6.4	1	06/05/24 15:40	06/07/24 16:24	7440-42-8	
Calcium	143000	ug/L	200	26.9	1	06/05/24 15:40	06/07/24 16:24	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 15:40	06/07/24 16:24	7439-89-6	
Magnesium	27700	ug/L	50.0	20.1	1	06/05/24 15:40	06/07/24 16:24	7439-95-4	
Manganese	222	ug/L	5.0	0.39	1	06/05/24 15:40	06/07/24 16:24	7439-96-5	
Potassium	7620	ug/L	500	69.7	1	06/05/24 15:40	06/07/24 16:24	7440-09-7	
Sodium	5120	ug/L	500	115	1	06/05/24 15:40	06/07/24 16:24	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	<10.5	mg/L	20.0	10.5	1		06/08/24 14:54		
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 12:50		
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 20:45	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/12/24 20:45	16984-48-8	N2
Sulfate	<0.55	mg/L	1.0	0.55	1		06/12/24 20:45	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

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

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Kansas City									
Boron	143	ug/L	100	6.4	1	06/05/24 14:26	06/07/24 12:53	7440-42-8	
Calcium	87100	ug/L	200	26.9	1	06/05/24 14:26	06/07/24 12:53	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	06/05/24 14:26	06/07/24 12:53	7439-89-6	
Magnesium	18100	ug/L	50.0	20.1	1	06/05/24 14:26	06/07/24 12:53	7439-95-4	
Manganese	25.4	ug/L	5.0	0.39	1	06/05/24 14:26	06/07/24 12:53	7439-96-5	
Potassium	4150	ug/L	500	69.7	1	06/05/24 14:26	06/07/24 12:53	7440-09-7	
Sodium	8680	ug/L	500	115	1	06/05/24 14:26	06/07/24 12:53	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	272	mg/L	20.0	10.5	1		06/06/24 15:57		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	335	mg/L	10.0	10.0	1		06/03/24 13:07		
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Kansas City									
Chloride	6.7	mg/L	1.0	0.53	1		06/13/24 05:13	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/13/24 05:13	16984-48-8	N2
Sulfate	35.8	mg/L	5.0	2.8	5		06/13/24 05:31	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

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 CaCO ₃	408	mg/L	20.0	10.5	1		06/05/24 17:24		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	470	mg/L	10.0	10.0	1		06/03/24 13:05		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City							
Chloride	10.1	mg/L	1.0	0.53	1		06/12/24 18:30	16887-00-6	
Fluoride	<0.12	mg/L	0.20	0.12	1		06/12/24 18:30	16984-48-8	N2
Sulfate	37.7	mg/L	10.0	5.5	10		06/12/24 18:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD

Pace Project No.: 60453819

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 CaCO ₃	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	

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 896847

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3549596

Matrix: Water

Associated Lab Samples: 60453812001, 60453812002, 60453817001

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

LABORATORY CONTROL SAMPLE: 3549597

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3549598 3549599

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

MATRIX SPIKE SAMPLE: 3549600

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

MATRIX SPIKE SAMPLE:		3549600					
		60453812008	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 896850

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

METHOD BLANK: 3549612

Matrix: Water

Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

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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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

MATRIX SPIKE SAMPLE:		3549616					
		60453862001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 896743

Analysis Method: SM 2320B

QC Batch 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 CaCO ₃	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 CaCO ₃	mg/L	500	518	104	90-110	

SAMPLE DUPLICATE: 3549171

Parameter	Units	60453805003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	265	265	0	10	

SAMPLE DUPLICATE: 3549172

Parameter	Units	60453812001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	408	413	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 896832

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453817001

METHOD BLANK: 3549490

Matrix: Water

Associated Lab Samples: 60453817001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	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 CaCO ₃	mg/L	500	518	104	90-110	

SAMPLE DUPLICATE: 3549492

Parameter	Units	60453817003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	539	544	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 897224

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453819002, 60453819003, 60453819004, 60453819005

METHOD BLANK: 3551323

Matrix: Water

Associated Lab Samples: 60453819002, 60453819003, 60453819004, 60453819005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<10.5	20.0	10.5	06/08/24 13:39	

LABORATORY CONTROL SAMPLE: 3551324

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	502	100	90-110	

SAMPLE DUPLICATE: 3551325

Parameter	Units	60453717002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	1880	1730	8	10	

SAMPLE DUPLICATE: 3551326

Parameter	Units	60453957001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	224	226	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

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: 60453819001

METHOD BLANK: 3551348

Matrix: Water

Associated Lab Samples: 60453819001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	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 CaCO ₃	mg/L	500	520	104	90-110	

SAMPLE DUPLICATE: 3551350

Parameter	Units	60453818005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	354	368	4	10	

SAMPLE DUPLICATE: 3551351

Parameter	Units	60453819001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	276	280	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch:	896436	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3548054 Matrix: Water

Associated Lab Samples: 60453812001, 60453812002, 60453817001

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

LABORATORY CONTROL SAMPLE: 3548055

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

SAMPLE DUPLICATE: 3548056

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

SAMPLE DUPLICATE: 3548057

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 896439

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

METHOD BLANK: 3548058

Matrix: Water

Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

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 SCPD

Pace Project No.: 60453819

QC Batch: 897826

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Laboratory:

Pace Analytical Services - Kansas City

Associated Lab Samples: 60453812001, 60453812002, 60453817001

METHOD BLANK: 3554025

Matrix: Water

Associated Lab Samples: 60453812001, 60453812002, 60453817001

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

LABORATORY CONTROL SAMPLE: 3554026

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3554027 3554028

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

MATRIX SPIKE SAMPLE: 3554029

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD

Pace Project No.: 60453819

QC Batch: 897827 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

METHOD BLANK: 3554031 Matrix: Water
Associated Lab Samples: 60453819001, 60453819002, 60453819003, 60453819004, 60453819005

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	

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 SCPD

Pace Project No.: 60453819

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	

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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QUALIFIERS

Project: AMEREN SCPD

Pace Project No.: 60453819

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD

Pace Project No.: 60453819

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60453812001	S-BMW-1S	EPA 200.7	896847	EPA 200.7	897011
60453812002	S-BMW-3S	EPA 200.7	896847	EPA 200.7	897011
60453817001	S-UG-2	EPA 200.7	896847	EPA 200.7	897011
60453819001	S-TMW-4	EPA 200.7	896850	EPA 200.7	896993
60453819002	S-TMW-5	EPA 200.7	896850	EPA 200.7	896993
60453819003	S-TMW-6	EPA 200.7	896850	EPA 200.7	896993
60453819004	S-SCPD-DUP-1	EPA 200.7	896850	EPA 200.7	896993
60453819005	S-SCPD-FB-1	EPA 200.7	896850	EPA 200.7	896993
60453812001	S-BMW-1S	SM 2320B	896743		
60453812002	S-BMW-3S	SM 2320B	896743		
60453817001	S-UG-2	SM 2320B	896832		
60453819001	S-TMW-4	SM 2320B	897229		
60453819002	S-TMW-5	SM 2320B	897224		
60453819003	S-TMW-6	SM 2320B	897224		
60453819004	S-SCPD-DUP-1	SM 2320B	897224		
60453819005	S-SCPD-FB-1	SM 2320B	897224		
60453812001	S-BMW-1S	SM 2540C	896436		
60453812002	S-BMW-3S	SM 2540C	896436		
60453817001	S-UG-2	SM 2540C	896436		
60453819001	S-TMW-4	SM 2540C	896439		
60453819002	S-TMW-5	SM 2540C	896439		
60453819003	S-TMW-6	SM 2540C	896439		
60453819004	S-SCPD-DUP-1	SM 2540C	896439		
60453819005	S-SCPD-FB-1	SM 2540C	896439		
60453812001	S-BMW-1S	EPA 300.0	897826		
60453812002	S-BMW-3S	EPA 300.0	897826		
60453817001	S-UG-2	EPA 300.0	897826		
60453819001	S-TMW-4	EPA 300.0	897827		
60453819002	S-TMW-5	EPA 300.0	897827		
60453819003	S-TMW-6	EPA 300.0	897827		
60453819004	S-SCPD-DUP-1	EPA 300.0	897827		
60453819005	S-SCPD-FB-1	EPA 300.0	897827		

REPORT OF LABORATORY ANALYSIS

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WO#: 60453819



DC#_Title: ENV-FRM-LENE-0009_Sample

Revision: 2

Effective Date: 01/12/2022

Issued By: Lenexa

Client Name: Rochsmith Geoen

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 2.2/2.1 Corr. Factor 0.0 Corrected 2.2/2.1/1.4

Date and initials of person examining contents:

Temperature should be above freezing to 6°C 1.4

PS 5/30/24

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____

Client: Racksmith Geoeng

Profile #

15857

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	BP3C	BP3Z	WPDU	ZPLC	Other
1	WT																		3				3							
2																			1				1							
3																			1				1							
4																			1				1							
5																			1				1							
6																			1				1							
7																			1				1							
8																			1				1							
9																			1				1							
10																			1				1							
11																			1				1							
12																			1				1							

Container Codes

Glass		Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1C	1L NAOH plastic
DG9H	40mL HCl amber vial	WGKU	4oz clear soil jar	BP1N	1L HNO3 plastic
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2C	500mL NAOH plastic
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3C	250mL NaOH plastic
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered
BG3H	250mL HCl Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate
				BP4U	125mL unpreserved plastic
				BP4N	125mL HNO3 plastic
				BP4S	125mL H2SO4 plastic
				WPDU	16oz unpreserved plastic

Work Order Number:

60053819



Memorandum

August 7, 2024

To: Project File
Rocksmith Geoengineering, LLC

Project Number: 23009-24

CC: Mark Haddock, Jeffrey Ingram

From: Jack Rasmussen

Email: Jack.Rasmussen@Rocksmithgeo.com

RE: **Data Validation Summary, Sioux Energy Center – SCPD – Data Package 60453819**

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
 Project Name: Ameren SCPD
 Reviewer: J. Rasmussen

Project Manager: J. Ingram
 Project Number: 23009-24
 Validation Date: 8/7/2024

Laboratory: Pace Analytical

SDG #: 60453819

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-4, S-TMW-5, S-TMW-6, S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2, 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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>05/28/24 - 05/29/24</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>JTA, GTM</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>_____</u>
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Spec Cond, Turb, Temp, DO, ORP</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>No lab narrative.</u>

Note Deficiencies: Based on careful review of the data, it appears that metals results for S-TMW-6 (-003) are incorrectly rereported for S-SCPD-FB-1 (-005), and vice versa, likely due to labeling error. All 200.7 metals analysis for these sample locations will be recorded and referred to as the correct sample location in this document and data tables associated with this sampling event.

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>_____</u>

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				S-SCPD-DUP-1 @ S-TMW-5
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Comments/Notes:

General:

Sulfate diluted in some samples, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

3549612: potassium (99.7J), sodium (287J), associated with samples -19001 through -19005. Samples -19001, -19002, -19004, -19005 results > RL and 10x blank, no qualification necessary. Sample -19003 detected below RL, report at RL and qualified as non-detect (U).

Field Blank:

200.7 metals results are switched between S-TMW-6 (-19003) and S-SCPD-FB-1 (-19005) due to labeling error.

S-SCPD-FB-1 @ S-TMW-6: potassium (93.5J), sodium (194J). Sample results > RL and 10x blank, no qualification necessary.

Duplicates:

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

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

MS/MSD:

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

3549614/3549615: MS recovery low for calcium, MSD and RPD within control limits, associated with sample -19001, no qualification necessary.

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

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

3554033/3554034: MS/MSD recovery high for chloride, fluoride, sulfate. Associated with sample -19001, results qualified as estimates.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

[illegible]

Data Qualification:

Signature: _____

Page 5 of 5



August 12, 2024

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

RE: Project: AMEREN SCPD - VERIFICATION
Pace Project No.: 60457658

Dear Mark Haddock:

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

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

- Pace Analytical Services - Kansas City

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

Sincerely,

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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Pace Analytical Services Kansas

9608 Loiret Boulevard, Lenexa, KS 66219

Arkansas Certification #: 88-00679

Illinois Certification #: 2000302023-6

Colorado Division of Oil and Public Safety

Iowa Certification #: 118

Kansas Field Laboratory Certification #: E-92587

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Missouri Inorganic Drinking Water Certification

Nevada Certification #: KS000212024-1

Oklahoma Certification #: 2023-073

Texas Certification #: T104704407-23-17

Utah Certification #: KS000212022-13

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60457658001	S-TMW-4	Water	07/29/24 11:34	07/31/24 07:07
60457658002	S-TMW-5	Water	07/29/24 12:41	07/31/24 07:07
60457658003	S-TMW-6	Water	07/29/24 12:30	07/31/24 07:07
60457658004	S-SCPD-DUP-1	Water	07/29/24 00:00	07/31/24 07:07
60457658005	S-SCPD-FB-1	Water	07/29/24 12:53	07/31/24 07:07

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60457658001	S-TMW-4	EPA 300.0	PL	2	PASI-K
60457658002	S-TMW-5	EPA 300.0	PL	2	PASI-K
60457658003	S-TMW-6	EPA 300.0	PL	2	PASI-K
60457658004	S-SCPD-DUP-1	EPA 300.0	PL	2	PASI-K
60457658005	S-SCPD-FB-1	EPA 300.0	PL	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Sample: S-TMW-4		Lab ID: 60457658001		Collected: 07/29/24 11:34		Received: 07/31/24 07:07		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	3.0	mg/L	1.0	0.53	1		08/06/24 14:29	16887-00-6	
Sulfate	69.2	mg/L	10.0	5.5	10		08/06/24 14:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Sample: S-TMW-5		Lab ID: 60457658002		Collected: 07/29/24 12:41		Received: 07/31/24 07:07		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	2.1	mg/L	1.0	0.53	1		08/08/24 14:50	16887-00-6	
Sulfate	64.6	mg/L	5.0	2.8	5		08/06/24 15:05	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Sample: S-TMW-6		Lab ID: 60457658003		Collected: 07/29/24 12:30		Received: 07/31/24 07:07		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	28.2	mg/L	10.0	5.3	10		08/06/24 17:32	16887-00-6	D6,M1
Sulfate	52.3	mg/L	10.0	5.5	10		08/06/24 17:32	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Sample: S-SCPD-DUP-1		Lab ID: 60457658004		Collected: 07/29/24 00:00		Received: 07/31/24 07:07		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	28.7	mg/L	10.0	5.3	10		08/06/24 19:04	16887-00-6	
Sulfate	49.4	mg/L	10.0	5.5	10		08/06/24 19:04	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

Sample: S-SCPD-FB-1		Lab ID: 60457658005		Collected: 07/29/24 12:53		Received: 07/31/24 07:07		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		08/06/24 19:22	16887-00-6	
Sulfate	<0.55	mg/L	1.0	0.55	1		08/06/24 19:22	14808-79-8	

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QUALITY CONTROL DATA

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

QC Batch:	904194	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60457658001, 60457658002, 60457658003, 60457658004, 60457658005

METHOD BLANK:	3578340	Matrix:	Water
Associated Lab Samples:	60457658001, 60457658002, 60457658003, 60457658004, 60457658005		

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

METHOD BLANK:	3580377	Matrix:	Water
Associated Lab Samples:	60457658001, 60457658002, 60457658003, 60457658004, 60457658005		

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

LABORATORY CONTROL SAMPLE:	3578341					
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

LABORATORY CONTROL SAMPLE:	3580378					
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE:	3578342			3578343								
Parameter	Units	60457658003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	28.2	50	50	61.9	64.6	67	73	80-120	4	15	M1
Sulfate	mg/L	52.3	50	50	96.2	105	88	106	80-120	9	15	

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 SCPD - VERIFICATION

Pace Project No.: 60457658

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578345													3578346			
Parameter	Units	60457660002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual				
			Spike Conc.	Spike Conc.												
Chloride	mg/L	54.4	250	250	248	248	78	77	80-120	0	15	M1				
Sulfate	mg/L	537	250	250	762	736	90	80	80-120	3	15					

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578348					3578349							
Parameter	Units	60457662001	MS	MSD	MS	MSD	MS	MSD	% Rec	RPD	Max	Qual
		Result	Spike Conc.	Spike Conc.								
Chloride	mg/L	9.0	5	5	11.6	11.5	51	50	80-120	0	15	M1
Sulfate	mg/L	82.2	5	5	88.0	90.3	116	163	80-120	3	15	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3578351					3578352							
Parameter	Units	60457663003	MS	MSD	MS	MSD	MS	MSD	% Rec	RPD	Max	Qual
		Result	Spike	Spike								
Chloride	mg/L	34.0	25	25	45.7	45.7	47	47	80-120	0	15	M1
Sulfate	mg/L	83.3	25	25	108	110	101	105	80-120	1	15	

SAMPLE DUPLICATE: 3578344

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

SAMPLE DUPLICATE: 3578347

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

SAMPLE DUPLICATE: 3578350

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

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 SCPD - VERIFICATION
Pace Project No.: 60457658

SAMPLE DUPLICATE: 3578353

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

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

REPORT OF LABORATORY ANALYSIS



QUALIFIERS

Project: AMEREN SCPD - VERIFICATION

Pace Project No.: 60457658

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD - VERIFICATION
Pace Project No.: 60457658

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60457658001	S-TMW-4	EPA 300.0	904194		
60457658002	S-TMW-5	EPA 300.0	904194		
60457658003	S-TMW-6	EPA 300.0	904194		
60457658004	S-SCPD-DUP-1	EPA 300.0	904194		
60457658005	S-SCPD-FB-1	EPA 300.0	904194		

REPORT OF LABORATORY ANALYSIS



DC#_Title: ENV-FRM-LENE-0009_Sample C

Revision: 2

Effective Date: 01/12/2022

W0#: 60457658

Client Name: Rocksmitz GeoCourier: 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 1.4/1.0Date and initials of person
examining contents:

Temperature should be above freezing to 6°C

PV 7/31/24

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT#:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____



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

Client: Rocksmitz 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	5																			-										
2																				-										
3																				-										
4																				-										
5																				-										
6																														
7																														
8																														
9																														
10																														
11																														
12																														

Container Codes

Glass		Plastic		Misc.	
DG9B	40mL bisulfate clear vial	WGKU	8oz clear soil jar	BP1B	1L NaOH plastic
DG9H	40mL HCl amber vial	WGFU	4oz clear soil jar	BP1N	1L HNO3 plastic
DG9M	40mL MeOH clear vial	WG2U	2oz clear soil jar	BP1S	1L H2SO4 plastic
DG9Q	40mL TSP amber vial	JGFU	4oz unpreserved amber wide	BP1U	1L unpreserved plastic
DG9S	40mL H2SO4 amber vial	AG0U	100mL unores amber glass	BP1Z	1L NaOH, Zn Acetate
DG9T	40mL Na Thio amber vial	AG1H	1L HCl amber glass	BP2B	500mL NaOH plastic
DG9U	40mL amber unpreserved	AG1S	1L H2SO4 amber glass	BP2N	500mL HNO3 plastic
VG9H	40mL HCl clear vial	AG1T	1L Na Thiosulfate clear/amber glass	BP2S	500mL H2SO4 plastic
VG9T	40mL Na Thio. clear vial	AG1U	1liter unpres amber glass	BP2U	500mL unpreserved plastic
VG9U	40mL unpreserved clear vial	AG2N	500mL HNO3 amber glass	BP2Z	500mL NaOH, Zn Acetate
BG1S	1liter H2SO4 clear glass	AG2S	500mL H2SO4 amber glass	BP3B	250mL NaOH plastic
BG1U	1liter unpres glass	AG3S	250mL H2SO4 amber glass	BP3F	250mL HNO3 plastic - field filtered
BG3H	250mL HCL Clear glass	AG2U	500mL unpres amber glass	BP3N	250mL HNO3 plastic
BG3U	250mL Unpres Clear glass	AG3U	250mL unpres amber glass	BP3U	250mL unpreserved plastic
WGDU	16oz clear soil jar	AG4U	125mL unpres amber glass	BP3S	250mL H2SO4 plastic
		AG5U	100mL unpres amber glass	BP3Z	250mL NaOH, Zn Acetate
				BP4U	125mL unpreserved plastic
				BP4N	125mL HNO3 plastic
				BP4S	125mL H2SO4 plastic
				WPDU	16oz unpreserved plastic

Work Order Number:

60457658



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 – SCPD – Data Package 60457658**

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 duplicate criterion was not met, the associated sample result was qualified as an estimate (J for detects, UJ for non-detects).
- When a matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J, J+ for estimates based high, and J- for estimates based low). 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 SCPD - Verification

Project Number: 23009-24

Reviewer: J. Rasmussen

Validation Date: 08/14/2024

Laboratory: Pace Analytical

SDG #: 60457658

Analytical Method (type and no.): EPA 300.0 (Anions)

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____

Sample Names S-TMW-4, S-TMW-5, S-TMW-6, S-SCPD-DUP-1, S-SCPD-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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>07/29/2024</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>GTM/JTR</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Spec Cond, Turb, Temp, DO, ORP</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>No lab narrative.</u>
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<hr/>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<hr/>
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<hr/>
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<hr/>

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<hr/>
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<hr/>
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<hr/>

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				S-SCPD-DUP-1 @ S-TMW-4
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<hr/>
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<hr/>

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

Comments/Notes:

General:

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

Duplicate:

S-SCPD-DUP-1 @ S-TMW-4: field duplicate RPD exceeds control limit (20%) for chloride (162%) and sulfate (33%), results qualified as estimates.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

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

3578344: Lab duplicate exceeds max RPD for chloride, associated with sample -003, results qualified as estimates.

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

MS/MSD:

3578342/3578343: MS and MSD recovery low for chloride, RPD okay. Associated with sample -003, result qualified as estimates.

3578345/3578346: MS and MSD recovery low for chloride, RPD okay. Associated with unrelated sample.

3578348/3578349: MS and MSD recovery low for chloride, RPD okay. MSD recovery high for sulfate, MS and RPD okay.

Associated with unrelated sample, no qualification estimates.

3578351/3578352: MS and MSD recovery low for chloride, RPD okay. Associated with unrelated sample.

Data Qualification:

Signature: _____

Page 4 of 4



December 24, 2024

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

RE: Project: AMEREN SCPD (EVENT 1)
Pace Project No.: 60465166

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

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CERTIFICATIONS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

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

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SAMPLE SUMMARY

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60465166001	S-TMW-4	Water	11/19/24 09:08	11/21/24 10:01
60465166002	S-TMW-5	Water	11/19/24 10:01	11/21/24 10:01
60465166003	S-TMW-6	Water	11/19/24 11:07	11/21/24 10:01
60465166004	S-SCPD-DUP-1	Water	11/19/24 00:00	11/21/24 10:01
60465166005	S-SCPD-FB-1	Water	11/19/24 09:59	11/21/24 10:01
60464704001	S-UG-2	Water	11/14/24 12:12	11/15/24 05:55
60464699012	S-BMW-3S	Water	11/20/24 11:43	11/21/24 07:45
60464699011	S-BMW-1S	Water	11/20/24 09:00	11/21/24 07:45

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SAMPLE ANALYTE COUNT

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60465166001	S-TMW-4	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
60465166002	S-TMW-5	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
60465166003	S-TMW-6	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
60465166004	S-SCPD-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
60465166005	S-SCPD-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
60464704001	S-UG-2	EPA 200.7	ARMN	7	PASI-K
		SM 2320B	TML	1	PASI-K
		SM 2540C	TML	1	PASI-K
		EPA 300.0	AAA	3	PASI-K
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
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

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Sample: S-TMW-4 Lab ID: 60465166001 Collected: 11/19/24 09:08 Received: 11/21/24 10:01 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Kansas City									
Boron	100	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:12	7440-42-8	B
Calcium	116000	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:12	7440-70-2	
Iron	23.7J	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:12	7439-89-6	
Magnesium	31100	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:12	7439-95-4	
Manganese	745	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:12	7439-96-5	
Potassium	6820	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:12	7440-09-7	
Sodium	5900	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:12	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	355	mg/L	20.0	10.5	1		12/02/24 15:24		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	484	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	2.4	mg/L	1.0	0.53	1		12/03/24 18:19	16887-00-6	
Fluoride	0.43	mg/L	0.20	0.12	1		12/03/24 18:19	16984-48-8	
Sulfate	58.1	mg/L	10.0	5.5	10		12/03/24 18:32	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Sample: S-TMW-5		Lab ID: 60465166002		Collected: 11/19/24 10:01		Received: 11/21/24 10:01		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	72.5J	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:19	7440-42-8	B
Calcium	99800	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:19	7440-70-2	
Iron	25.0J	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:19	7439-89-6	
Magnesium	18700	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:19	7439-95-4	
Manganese	795	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:19	7439-96-5	
Potassium	4750	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:19	7440-09-7	
Sodium	3710	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:19	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B Pace Analytical Services - Kansas City							
Alkalinity, Total as CaCO ₃	267	mg/L	20.0	10.5	1		12/02/24 15:41		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	405	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	1.5	mg/L	1.0	0.53	1		12/04/24 22:40	16887-00-6	
Fluoride	0.40	mg/L	0.20	0.12	1		12/04/24 22:40	16984-48-8	
Sulfate	83.9	mg/L	10.0	5.5	10		12/04/24 23:08	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Sample: S-TMW-6 Lab ID: 60465166003 Collected: 11/19/24 11:07 Received: 11/21/24 10:01 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	106	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:21	7440-42-8	B
Calcium	133000	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:21	7440-70-2	
Iron	22.6J	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:21	7439-89-6	
Magnesium	27300	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:21	7439-95-4	
Manganese	508	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:21	7439-96-5	
Potassium	29500	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:21	7440-09-7	
Sodium	4790	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:21	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	428	mg/L	20.0	10.5	1		12/02/24 15:47		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	556	mg/L	13.3	13.3	1		11/26/24 15:39		
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Kansas City									
Chloride	5.1	mg/L	1.0	0.53	1		12/04/24 08:46	16887-00-6	M1
Fluoride	0.30	mg/L	0.20	0.12	1		12/04/24 08:46	16984-48-8	
Sulfate	44.5	mg/L	5.0	2.8	5		12/04/24 08:58	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Sample: S-SCPD-DUP-1		Lab ID: 60465166004		Collected: 11/19/24 00:00		Received: 11/21/24 10:01		Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City							
Boron	98.3J	ug/L	100	6.4	1	11/22/24 08:54	12/10/24 17:23	7440-42-8	
Calcium	114000	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:23	7440-70-2	
Iron	<9.1	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:23	7439-89-6	
Magnesium	30500	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:23	7439-95-4	
Manganese	726	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:23	7439-96-5	
Potassium	6720	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:23	7440-09-7	
Sodium	5800	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:23	7440-23-5	
2320B Alkalinity		Analytical Method: SM 2320B Pace Analytical Services - Kansas City							
Alkalinity, Total as CaCO ₃	350	mg/L	20.0	10.5	1		12/02/24 16:00		
2540C Total Dissolved Solids		Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	490	mg/L	10.0	10.0	1		11/26/24 15:39		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City							
Chloride	2.5	mg/L	1.0	0.53	1		12/04/24 11:45	16887-00-6	
Fluoride	0.44	mg/L	0.20	0.12	1		12/04/24 11:45	16984-48-8	
Sulfate	56.2	mg/L	5.0	2.8	5		12/04/24 11:58	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Sample: S-SCPD-FB-1		Lab ID: 60465166005		Collected: 11/19/24 09:59		Received: 11/21/24 10:01		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 17:24	7440-42-8	
Calcium	32.8J	ug/L	200	26.9	1	11/22/24 08:54	12/10/24 17:24	7440-70-2	B
Iron	<9.1	ug/L	50.0	9.1	1	11/22/24 08:54	12/10/24 17:24	7439-89-6	
Magnesium	<20.1	ug/L	50.0	20.1	1	11/22/24 08:54	12/10/24 17:24	7439-95-4	
Manganese	<0.39	ug/L	5.0	0.39	1	11/22/24 08:54	12/10/24 17:24	7439-96-5	
Potassium	<69.7	ug/L	500	69.7	1	11/22/24 08:54	12/10/24 17:24	7440-09-7	
Sodium	163J	ug/L	500	115	1	11/22/24 08:54	12/10/24 17:24	7440-23-5	B
2320B Alkalinity		Analytical Method: SM 2320B Pace Analytical Services - Kansas City							
Alkalinity, Total as CaCO ₃	<10.5	mg/L	20.0	10.5	1		12/02/24 16:26		
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 15:39		
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		12/04/24 12:24	16887-00-6	
Fluoride	0.22	mg/L	0.20	0.12	1		12/04/24 12:24	16984-48-8	
Sulfate	<0.55	mg/L	1.0	0.55	1		12/04/24 12:24	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

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

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Pace Analytical Services - Kansas City									
Boron	112	ug/L	100	6.4	1	11/18/24 09:30	12/04/24 12:53	7440-42-8	
Calcium	90800	ug/L	200	26.9	1	11/18/24 09:30	12/04/24 12:53	7440-70-2	
Iron	10.9J	ug/L	50.0	9.1	1	11/18/24 09:30	12/04/24 12:53	7439-89-6	
Magnesium	18800	ug/L	50.0	20.1	1	11/18/24 09:30	12/04/24 12:53	7439-95-4	
Manganese	19.5	ug/L	5.0	0.39	1	11/18/24 09:30	12/04/24 12:53	7439-96-5	
Potassium	4560	ug/L	500	69.7	1	11/18/24 09:30	12/04/24 12:53	7440-09-7	
Sodium	36200	ug/L	500	115	1	11/18/24 09:30	12/04/24 12:53	7440-23-5	
2320B Alkalinity									
Analytical Method: SM 2320B									
Pace Analytical Services - Kansas City									
Alkalinity, Total as CaCO ₃	326	mg/L	20.0	10.5	1		11/27/24 17:39		
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Pace Analytical Services - Kansas City									
Total Dissolved Solids	409	mg/L	10.0	10.0	1		11/19/24 12:19		
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Pace Analytical Services - Kansas City									
Chloride	26.5	mg/L	5.0	2.6	5		11/30/24 18:48	16887-00-6	
Fluoride	0.29	mg/L	0.20	0.12	1		11/30/24 18:35	16984-48-8	
Sulfate	29.4	mg/L	5.0	2.8	5		11/30/24 18:48	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

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	

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ANALYTICAL RESULTS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

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	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 916731

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3630013

Matrix: Water

Associated Lab Samples: 60464704001

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

LABORATORY CONTROL SAMPLE: 3630019

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

MATRIX SPIKE SAMPLE: 3629944

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3630020 3630021

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3630020 3630021												
Parameter	Units	60464667005	MS	MSD	MS	MSD	MS	MSD	% Rec	RPD	Max	Qual
		Result	Spike Conc.	Spike Conc.								
Iron	ug/L	895	10000	10000	11500	11200	106	103	70-130	3	20	
Magnesium	ug/L	36200	10000	10000	45700	45600	95	93	70-130	0	20	
Manganese	ug/L	31.6	1000	1000	1050	1040	102	101	70-130	1	20	
Potassium	ug/L	21000	10000	10000	30600	31100	96	101	70-130	2	20	
Sodium	ug/L	280000	10000	10000	287000	289000	73	90	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 917371

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3632816

Matrix: Water

Associated Lab Samples: 60464699011, 60464699012

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

LABORATORY CONTROL SAMPLE: 3632817

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3632818 3632819

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

MATRIX SPIKE SAMPLE: 3632820

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

MATRIX SPIKE SAMPLE:		3632820					
		60464699018	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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 SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	917373	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004, 60465166005

METHOD BLANK: 3632823

Matrix: Water

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004, 60465166005

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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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 917909

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3634992

Matrix: Water

Associated Lab Samples: 60464704001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	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 CaCO ₃	mg/L	500	480	96	90-110	

SAMPLE DUPLICATE: 3634994

Parameter	Units	60464293013 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	343	347	1	10	

SAMPLE DUPLICATE: 3634995

Parameter	Units	60464699001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	337	339	1	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	918130	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004

METHOD BLANK: 3635810 Matrix: Water

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	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 CaCO ₃	mg/L	500	481	96	90-110	

SAMPLE DUPLICATE: 3635812

Parameter	Units	60464769008 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	301	294	2	10	

SAMPLE DUPLICATE: 3635813

Parameter	Units	60465166003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	428	438	2	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	918131	Analysis Method:	SM 2320B
QC Batch Method:	SM 2320B	Analysis Description:	2320B Alkalinity
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60464699011, 60464699012, 60465166005

METHOD BLANK: 3635814 Matrix: Water

Associated Lab Samples: 60464699011, 60464699012, 60465166005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	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 CaCO ₃	mg/L	500	487	97	90-110	

SAMPLE DUPLICATE: 3635816

Parameter	Units	60464699019 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	306	306	0	10	

SAMPLE DUPLICATE: 3635817

Parameter	Units	60465156001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	329	347	5	10	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 916954

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3630622

Matrix: Water

Associated Lab Samples: 60464704001

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

LABORATORY CONTROL SAMPLE: 3630623

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

SAMPLE DUPLICATE: 3630624

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

SAMPLE DUPLICATE: 3630625

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	917791	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004, 60465166005

METHOD BLANK: 3634577 Matrix: Water

Associated Lab Samples: 60465166001, 60465166002, 60465166003, 60465166004, 60465166005

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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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	917911	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60464699011, 60464699012

METHOD BLANK: 3635001 Matrix: Water

Associated Lab Samples: 60464699011, 60464699012

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

LABORATORY CONTROL SAMPLE: 3635002

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

SAMPLE DUPLICATE: 3635003

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

SAMPLE DUPLICATE: 3635004

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 917888

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60464704001

METHOD BLANK: 3634901

Matrix: Water

Associated Lab Samples: 60464704001

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

LABORATORY CONTROL SAMPLE: 3634902

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

MATRIX SPIKE SAMPLE: 3634908

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

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 918072

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166001

METHOD BLANK: 3635661

Matrix: Water

Associated Lab Samples: 60465166001

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 SCPD (EVENT 1)

Pace Project No.: 60465166

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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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch:	918345	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
		Laboratory:	Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166003, 60465166004, 60465166005

METHOD BLANK: 3636649 Matrix: Water

Associated Lab Samples: 60465166003, 60465166004, 60465166005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/04/24 01:11	
Fluoride	mg/L	<0.12	0.20	0.12	12/04/24 01:11	
Sulfate	mg/L	<0.55	1.0	0.55	12/04/24 01:11	

LABORATORY CONTROL SAMPLE: 3636650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3636651 3636652

Parameter	Units	60465166003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	5.1	5	5	10.5	10.2	107	100	80-120	3	15	
Fluoride	mg/L	0.30	2.5	2.5	3.6	3.4	132	125	80-120	5	15	M1
Sulfate	mg/L	44.5	25	25	71.6	73.5	108	116	80-120	3	15	

MATRIX SPIKE SAMPLE: 3636654

Parameter	Units	60465266001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	ND	2000	2030	84	80-120	
Fluoride	mg/L	159	1000	1170	101	80-120	
Sulfate	mg/L	4490	2000	6480	100	80-120	

SAMPLE DUPLICATE: 3636653

Parameter	Units	60465166003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	5.1	5.3	3	15	
Fluoride	mg/L	0.30	0.31	3	15	
Sulfate	mg/L	44.5	44.3	0	15	

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 918350

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60465166002

METHOD BLANK: 3636670

Matrix: Water

Associated Lab Samples: 60465166002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.53	1.0	0.53	12/04/24 02:38	
Fluoride	mg/L	<0.12	0.20	0.12	12/04/24 02:38	
Sulfate	mg/L	<0.55	1.0	0.55	12/04/24 02:38	

LABORATORY CONTROL SAMPLE: 3636671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3636672

3636673

Parameter	Units	60464293006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	20.2	25	25	41.9	42.1	87	88	80-120	0	15	
Fluoride	mg/L	0.22	2.5	2.5	3.1	3.3	116	123	80-120	5	15	M1
Sulfate	mg/L	97.2	25	25	123	123	103	102	80-120	0	15	E

MATRIX SPIKE SAMPLE: 3636675

Parameter	Units	60464294012 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1230	250	1390	66	80-120	E,M1
Fluoride	mg/L	0.25	2.5	3.1	114	80-120	
Sulfate	mg/L	141	250	386	98	80-120	

SAMPLE DUPLICATE: 3636674

Parameter	Units	60464293006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	20.2	20.1	1	15	
Fluoride	mg/L	0.22	0.23	5	15	
Sulfate	mg/L	97.2	96.6	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

QC Batch: 919641

Analysis Method: EPA 300.0

QC Batch 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	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

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.

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

R1 RPD value was outside control limits.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPD (EVENT 1)

Pace Project No.: 60465166

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60464704001	S-UG-2	EPA 200.7	916731	EPA 200.7	916791
60464699011	S-BMW-1S	EPA 200.7	917371	EPA 200.7	917460
60464699012	S-BMW-3S	EPA 200.7	917371	EPA 200.7	917460
60465166001	S-TMW-4	EPA 200.7	917373	EPA 200.7	917466
60465166002	S-TMW-5	EPA 200.7	917373	EPA 200.7	917466
60465166003	S-TMW-6	EPA 200.7	917373	EPA 200.7	917466
60465166004	S-SCPD-DUP-1	EPA 200.7	917373	EPA 200.7	917466
60465166005	S-SCPD-FB-1	EPA 200.7	917373	EPA 200.7	917466
60464704001	S-UG-2	SM 2320B	917909		
60464699011	S-BMW-1S	SM 2320B	918131		
60464699012	S-BMW-3S	SM 2320B	918131		
60465166001	S-TMW-4	SM 2320B	918130		
60465166002	S-TMW-5	SM 2320B	918130		
60465166003	S-TMW-6	SM 2320B	918130		
60465166004	S-SCPD-DUP-1	SM 2320B	918130		
60465166005	S-SCPD-FB-1	SM 2320B	918131		
60464704001	S-UG-2	SM 2540C	916954		
60464699011	S-BMW-1S	SM 2540C	917911		
60464699012	S-BMW-3S	SM 2540C	917911		
60465166001	S-TMW-4	SM 2540C	917791		
60465166002	S-TMW-5	SM 2540C	917791		
60465166003	S-TMW-6	SM 2540C	917791		
60465166004	S-SCPD-DUP-1	SM 2540C	917791		
60465166005	S-SCPD-FB-1	SM 2540C	917791		
60464704001	S-UG-2	EPA 300.0	917888		
60464699011	S-BMW-1S	EPA 300.0	919641		
60464699012	S-BMW-3S	EPA 300.0	919641		
60465166001	S-TMW-4	EPA 300.0	918072		
60465166002	S-TMW-5	EPA 300.0	918350		
60465166003	S-TMW-6	EPA 300.0	918345		
60465166004	S-SCPD-DUP-1	EPA 300.0	918345		
60465166005	S-SCPD-FB-1	EPA 300.0	918345		

REPORT OF LABORATORY ANALYSIS

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WO# : 60465166



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

Client Name: Rocksmith Geology

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: Ice Blue ☐ None ☐

Cooler Temperature (°C): As-read 0.4/2.4 Corr. Factor -0.1 Corrected 0.3/2.3

Temperature should be above freezing to 6°C 2.9/1.8

Date and initials of person examining contents:

2.8/1.7

11/21/24

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> 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: _____

LAB USE ONLY - Affix Workorder/Login Label Here

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

Company Name:	Rocksmith Geopengineering, LLC.	Contact/Report To:	Mark Haddock
Street Address:	2370 Creve Coeur Mill Road, Maryland Heights, MO 63043	Phone #:	314-974-6578
		E-Mail:	mark_haddock@rocksmithgeo.com
		Cc E-Mail:	
Customer Project #:	COC# 12	Invoice To:	Mark Haddock
Project Name:	AMEREN SCDP (Event 1)	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 Deliverable:		Reportable:	[] Yes [] No
[] Level-I [] Level-II [] Level-III [] Level-IV			
[] EQUIS			
[] Other			
Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Waste Water (WW), Product (P), Soil/Solid (SS), Oil (OL), Wipe (WP), Tissue (TS), Biossay (B), Vapor (V), Surface Water (SW), Sediment (SED), Sludge (SL), Gunk (GK), Leachate (LL), Biosolid (BS), Other (OT)		Rush (Pre-approval required):	DW PWSID # or WW Permit # as applicable:
		[] Same Day [] 1 Day [] 2 Day [] 3 Day [] Other	
		Date Results	Field Filtered (if applicable): [] Yes [] No
		Requested:	Analysis:
Customer Sample ID		Composite Start	Collected or Composite End
	Matrix *	Date	Date
	Comp / Grab	Time	Time
S-TMW-4	WT		11-19-24 0908 2
S-TMW-5	WT		11-19-24 1001 2
S-TMW-6	WT		11-19-24 1107 2
S-SCPD-DUP-1	WT		11-19-24 - 2
S-SCPD-FB-1	WT		11-19-24 0959 2
S-SCPD-MS-1	WT		1107 2
S-SCPD-MSD-1	WT		1107 2
S-BMW-1S	WT		11/20/24 0900 2
S-BMW-3S	WT		11/20/24 1143 2

Customer	Remarks	Special Conditions	Possible Hazards

(Printed Name)		Thermometer ID:		Obs. Temp. (°C)		Corrected Temp. (°C)		On Ice	
Signature:		4		7298		-0.1		0.3/2.3/2.8/1.7	
Date/Time:		11/20/24		11/21/24		0745		Tracking Number:	
Relinquished by/Company: (Signature)		Relinquished by/Company: (Signature)		Date/Time:		Delivered by: <input type="checkbox"/> In Person <input type="checkbox"/> Courier			
Relinquished by/Company: (Signature)		Relinquished by/Company: (Signature)		Date/Time:		Delivered by: <input type="checkbox"/> FedEx <input type="checkbox"/> UPS <input type="checkbox"/> Other			
Relinquished by/Company: (Signature)		Relinquished by/Company: (Signature)		Date/Time:		Page: 1 of 1			

Client: Rocks with Geomg

Profile: EZ

3165160

Notes: Do not 109 page 2 coc.

Site:

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																		12		201/22/24		12							
2																			1				1							
3																			3				3							
4																			1				1							
5																			1				1							
6																														
7																														
8																														
9																														
10																														
11																														
12																														

(Do not 109)

Container Codes

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

Matrix

Work Order Number:

60465166



Memorandum

January 23, 2025

To: Project File
Rocksmith Geoengineering, LLC

Project Number: 23009-24

CC: Mark Haddock, Jeffrey Ingram

From: Grant Morey

Email: grant.morey@rocksmithgeo.com

RE: Data Validation Summary, Sioux Energy Center – SCPD – Data Package 60465166

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).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
 Project Name: Ameren SCPD
 Reviewer: G. Morey

Project Manager: J. Ingram
 Project Number: 23009-24
 Validation Date: 01/23/2025

Laboratory: Pace Analytical

SDG #: 60465166

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-4, S-TMW-5, S-TMW-6, S-SCPD-DUP-1, S-SCPD-FB-1, S-UG-2, 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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>11/14/24-11/20/24</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>GTM/JTR/JDQ</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Spec Cond, Turb, Temp, DO, ORP</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>No lab narrative.</u>
Note Deficiencies: _____				

Chain-of-Custody (COC)	YES	NO	NA	COMMENTS
a) Was the COC properly completed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Was the COC signed by both field and laboratory personnel?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were samples received in good condition?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>See Notes</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Laboratory Control Sample (LCS)	YES	NO	NA	COMMENTS
a) Was a LCS analyzed once per SDG?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				S-SCPD-DUP-1 @ S-TMW-4
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	See Notes
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

Blind Standards	YES	NO	NA	COMMENTS
a) Was a blind standard used (indicate name, analytes included and concentrations)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was the %D within control limits?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Comments/Notes:

General:

Sulfate and chloride diluted in some samples, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Method Blanks:

3632823: calcium (43.2J), iron (18.1J), and sodium (184J). Associated with samples -6001 through -6005.

Calcium at -005 <RL, qualified as non-detect at RL. Iron at -001 to -003 < RL, qualified as non-detect at RL.

results qualified as non detect. Sodium at -005 < RL, qualified as non-detect at RL. Other sample results > 10x blank or non-detect, no qualification necessary.

Field Blanks:

S-SCPD-FB-1 @ S-TMW-5: calcium (32.8J), sodium (163J), and fluoride (0.22). Fluoride < 10x blank and > RL, result qualified as estimate. Other analytes > 10x blank, no qualification necessary.

Duplicates:

Field Duplicate: S-SCPD-DUP-1 @ S-TMW-4: iron (23.7J), detected in parent sample below RL, not detected in duplicate. results qualified as estimates.

Lab duplicate Max RPD: 10%: Alkalinity, TDS; 15%: Chloride, Fluoride, Sulfate

MS/MSD:

3629944: MS recovery high for calcium. Associated with unrelated sample, no qualification necessary.

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

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

3635663/3635664: MSD recovery high for chloride, MS recovery and RPD within control. MSD recovery and RPD outside control 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. Associated with unrelated sample, no qualification necessary.

3636651/3636652: MS/MSD recovery high for fluoride, RPD within control. Associated with -003, result qualified as estimate.

3636675: MS recovery low for chloride. Associated with unrelated sample, no qualification necessary.

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

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

3636672/3636673: MSD recovery high for fluoride, MS and RPD within no control limits. No qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

[illegible]

Signature: Grant Morey

Date: 01/23/2025

Appendix B

Alternative Source Demonstration – November 2023 Sampling Event

REPORT

SCPD – Alternative Source Demonstration

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

June 24, 2024

Project Number: 23009-24

Submitted to:



Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

Submitted by:



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



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1.0 CERTIFICATION STATEMENT

This *SCPD – 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 *SCPD – 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 SCPD – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increase (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPD Cell 2. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSIs were 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 SCPD. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPD lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits that lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet in thickness and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silt and clay. 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 – SCPD

UWL Cell 2 is referred to by Ameren as the SCPD, or "Gypsum Pond" Cell 2. The SCPD is approximately 36 acres in size and is located south of the generating plant on the south side of Highway 94 (Figure 1). The CCR Unit, which began operation on December 14, 2022, manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD).

The WFGD process occurs after the removal of slag and fly ash. A crushed limestone (CaCO_3) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)). The resultant gypsum material was formerly wet sluiced from the plant across the highway to the SCPC, and has been wet sluiced to SCPD since December 14, 2022. Once there, the gypsum is dewatered by gravity, with the sluice conveying recycled water back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPD cell is bounded immediately on the west by the SCPC surface Impoundment (UWL Cell 1), northeast by the SCL4A (UWL Cell 4a) landfill cell, the north by the UWL recycle pond, and south/southeast by low lying agricultural floodplain. The perimeter berm surrounding the SCPD is constructed to an elevation of 446 feet above mean sea level (MSL), which is approximately 5 feet above 100-year flood elevation of 441.2 feet MSL and about 12 to 18 feet above the surrounding low-lying farmland. This berm elevation is equivalent to the adjacent SCPC, SCL4A, and Recycle Pond areas. Additionally, the SCPD is lined with a bottom composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1×10^{-7} centimeters per second (cm/sec) overlain by a 60-mil flexible high-density polyethylene (HDPE) geomembrane liner. This liner system has a base elevation (top of liner/base of CCR) of approximately 432 feet MSL at its lowest point.

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 seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the Missouri UWL parameters. Placement of WFGD materials in the SCPD started on December 14, 2022.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, prior to the initial receipt of CCR on December 14, 2022 the following were completed: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPD consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. One monitoring well (UG-2) was installed by Gredell Engineering Resources, Inc. (Gredell) in December 2007 as a part of the Missouri UWL state monitoring program. This monitoring well is used in both the SCPC and SCPD groundwater monitoring well networks. The background monitoring wells (BMW-1S and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2016 for CCR Rule groundwater monitoring purposes. Three monitoring wells (TMW-4, TMW-5, and TMW-6) were installed in March 2022 to the south and southeast of the SCPD by WSP USA, Inc. (WSP) specifically for CCR groundwater monitoring of the SCPD. More information on the design and installation of the monitoring wells is provided in the SCPD GMP (WSP, 2022) and the SCPD 2022 Annual Report (WSP, 2023).

Between May 2016 and June 2017, eight baseline sampling events were completed for the existing monitoring wells used to monitor the SCPD (UG-2, BMW-1S, and BMW-3S). Eight baseline sampling events were also completed between March and October of 2022 for TMW-4, TMW-5, and TMW-6. After baseline sampling, the first Detection Monitoring event was completed in May 2023. The following Appendix III constituents were analyzed during Detection Monitoring:

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

In January 2023, background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPLs) for wells TMW-1, TMW-2, and TMW-3. Since monitoring well UG-2 is included in both the SCPC and SCPD monitoring networks, statistical limits for this well follow those used for SCPC monitoring, which were updated in March 2024 (Rocksmith, 2024). These UPLs were then compared to the Detection Monitoring results from the May 2023 sampling event and subsequent sampling events. If a result from the Detection Monitoring event is higher than the calculated UPL, it is classified as an initial exceedance, and a verification sample is then collected and tested in accordance with the SCPD Statistical Analysis Plan (SAP). In November 2023, two initial exceedances were identified: boron at UG-2 and sulfate at TMW-5. Verification sampling in February 2024 confirmed both initial exceedances as SSIs. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring wells UG-2 and TMW-5 are screened in the upper portion of the alluvial aquifer, just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, UG-2 is located north of the SCPD, which is south of the generating plant, highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road. TMW-5 is located immediately south of the SCPD.

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

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	Current UPL	Range of Values Prior to November 2023 Sampling Event (CCR Rule and State UWL Sampling)	November 2023 Result	February 2024 Result
Boron (µg/L)	UG-2	277.7	ND (<100) – 322 (with outliers between 491 - 2,180)	1,700	1,360
Sulfate (mg/L)	TMW-5	46.12	34.9 – 42.0	50.0 J	72.8

Notes:

- 1) mg/L – milligrams per liter.
- 2) µg/L – micrograms per liter.
- 3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
- 4) ND – Non-Detect.
- 5) J – Result is an estimated value.
- 6) Several outliers were identified at UG-2 prior to calculating the UPL for UG-2. These include eight high results collected between May 2013 and February 2015 inferred to be associated with the construction of the SCL4A. The range of these outliers is between 491 and 2,180 µg/L.

5.0 EVIDENCE OF SSI'S FROM ALTERNATIVE SOURCE

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

- Construction documents for the SCPD indicating the 60-mil high-density polyethylene (HDPE) geomembrane liner and a 2-foot thick clay barrier, verified by quality assurance testing during construction.
- Southward groundwater flow from the upgradient SCPA CCR Unit, currently in Corrective Action, toward the SCPD.
- Documentation of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCPD operation, especially on the northern side of the SCPD.
- Comparison of concentrations in nearby monitoring wells prior to the placement of CCR in the SCPD.
- Geochemical signatures of groundwater, CCR Unit porewater, and leachate indicate SCPC monitoring well samples are similar to unaffected background groundwater, and do not reflect impacts from leachate managed at adjacent CCR Units.

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.	<ul style="list-style-type: none"> • Boron • Molybdenum • Lithium • Sulfate
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.	<ul style="list-style-type: none"> • Bromide • Potassium • Sodium • Fluoride
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.	<ul style="list-style-type: none"> • 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 SCPD has historically received FGD type wastes that are managed at the SEC.

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

In 2018, an ASD was completed for the SCPB (fly ash pond) unit to the north/northwest of the SCPD and is available in the 2018 Annual Report for the SCPB on Ameren's publicly available website¹. In that ASD, pore-water samples were collected from the SCPA and SCPB, and samples were collected in the shallow, intermediate (middle) and deep zones of the alluvial aquifer just outside of the two units. From this ASD, it was determined that CCR impacts found directly outside of the SCPB are from the SCPA and not the SCPB. Impacts were present at their highest concentrations at deeper depths, and groundwater chemistry was similar between the waters of the SCPA and the impacted wells. The SCPB ASD concluded these deeper impacts are from the SCPA because the SCPA is an unlined CCR unit that extends approximately 70 feet below ground surface, while the SCPB is an HDPE-lined, shallower CCR unit. Therefore, if impacts were from the SCPB, they would be expected to be concentrated in the shallow zone of the alluvial aquifer, whereas impacts from the SCPA would be present across all zones of the alluvial aquifer. Additionally, the SCPA has historically managed bottom ash, fly ash, and boiler slag. As displayed in **Table 2**, boron is a key indicator parameter for impacts from these types of CCR.

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

In 2018 and 2019, the SCPA moved from Assessment Monitoring into Corrective Action and an investigation into the nature and extent of impacts from the SCPA was completed. As a part of this investigation, samples were collected in the shallow, middle, and deep zones of the alluvial aquifer in multiple locations around the site. One set of piezometers (TP-5) was installed approximately 200 feet to the east of UG-2. In the TP-5 piezometers,

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

boron concentrations ranged from 211-263 µg/L in the shallow zone of the alluvial aquifer; 3,120-3,190 µg/L in the intermediate zone, and 5,460-8,250 µg/L in the deep zone of the alluvial aquifer.

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

For boron impacts to be from the SCPA, UG-2 would need to be hydraulically connected to the SCPA. As displayed on **Figure 1**, UG-2 is located approximately 1,500 feet at its nearest point to the south/southeast of the SCPA. As discussed in the Annual Reports for the SCPC and SCPD, publicly available on Ameren's website, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, which affect water levels, gradients and flow directions in 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 or south toward the Mississippi and Missouri Rivers, depending on river levels.

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

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

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

Figure 4 displays the difference between the Mississippi and Missouri River for each day. **Table 6** provides a summary comparison of the Mississippi and Missouri River elevations at the plant. Using the data from January 1, 1987 to June 17, 2024, the Mississippi River was higher than the Missouri River on 7,634 of the 13,683 days (approximately 56% of the time). From 2021 through early 2024, there was a significant hydraulic gradient from the Mississippi to the Missouri River (southward), with 2023 being the second highest average gradient of southward groundwater flow since 1987 (2006 was the highest). This indicates that UG-2, which is south of the SCPA, is downgradient of the unit and hydraulically connected.

This southward flow of groundwater since 2021 has been confirmed by onsite water level measurements. Prior to each sampling event, water levels are recorded at all monitoring wells to determine groundwater flow rates and direction. Potentiometric surface maps generated from these water level measurements display a southward flow of groundwater from the SCPA toward UG-2 since 2021.

Table 4 – Summary of Mississippi and Missouri River Elevations

Year	Days Missouri River has Higher Elevation	Days Mississippi River has Higher Elevation	Average Annual Difference between Mississippi and Missouri Rivers
			(Results in Feet, number displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation)
1987	243	122	-1.38
1988	82	284	1.48
1989	41	324	2.24
1990	162	203	0.32
1991	92	273	1.34
1992	152	214	-0.20
1993	355	10	-3.05
1994	166	199	-1.17
1995	269	96	-1.62
1996	242	124	-0.98
1997	312	53	-1.70
1998	317	48	-2.21
1999	207	158	-1.15
2000	28	338	2.30
2001	133	232	0.66
2002	63	302	2.18
2003	28	337	3.12
2004	125	241	1.08
2005	88	277	1.91
2006	11	354	4.05
2007	141	224	0.71
2008	209	157	-0.29
2009	202	163	-0.32
2010	296	69	-1.79
2011	229	136	-1.58
2012	59	307	2.15
2013	51	314	2.46
2014	88	277	1.54
2015	177	188	-0.36
2016	196	170	-0.55
2017	154	211	0.46
2018	232	133	0.03
2019	349	16	-3.08
2020	234	132	-0.72
2021	160	205	0.31
2022	77	288	2.39
2023	20	345	3.38
2024	59	110	0.78
Total	5,990	7,472	Average Difference – 0.32 feet

5.3 Evaluation of the Statistically Significant Increase of Sulfate at TMW-5

Sulfate is a key indicator for potential CCR impacts because it is highly mobile in most hydrogeological environments, except where conditions are strongly reducing. The groundwater around the SCPD does not demonstrate strongly reducing conditions, such as negative oxidation reduction potential (ORP) and dissolved iron concentrations above 1 mg/L. No hydrogen sulfide odors have been reported at the SCPD.

The time series plot on **Figure 5** shows variability in sulfate concentrations at the TMW wells south of the SCPD since the onset of baseline monitoring. As displayed in the figure, sulfate concentrations ranged from 34.9 to 42.0 mg/L during the eight baseline sampling events at TMW-5. Since baseline sampling, there have only been four sulfate results at TMW-5, ranging from 36.8 to 72.8 mg/L. Two other SCPD monitoring wells are located approximately 520 and 610 feet to the east and west of TMW-5 as displayed in **Figure 1**: TMW-4 and TMW-6, respectively. Recent sulfate concentrations at TMW-6 are generally lower than baseline results, and recent concentrations at TMW-5 are higher than baseline results. This figure provides further evidence that the limited number of data points (8) used to calculate the intrawell UPL for sulfate at TMW-5 do not accurately reflect the natural geochemical variability within the groundwater. Sulfate concentrations in these monitoring wells have ranged from 30.7 to 47.7 mg/L and UPLs for these monitoring wells are 44.43 mg/L at TMW-4 and 51.85 mg/L at TMW-6. Based on the sulfate concentration range of the nearby wells, the sulfate concentration at TMW-5 in November 2023 is within the range of historical concentrations for adjacent wells, which indicates that the SSI for sulfate in TMW-5 is 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.

Figure 6 displays sulfate results in TMW-5 compared to background results from site background wells BMW-1S and BMW-3S. This figure displays that the concentration of 50.0 mg/L is below those reported for background wells at 12.3 – 61.1 mg/L. This demonstrates that the results from TMW-5 are below those of unimpacted background limits for sulfate in the shallow zone of the alluvial aquifer, and the full variability of sulfate in the shallow alluvial aquifer at this location has not been captured with the limited dataset.

To further investigate the geochemical variability of sulfate in the area of the SCPD, historical data from the state UWL wells [located on the south side of the UWL, outside the zone of impact from the SCPA] were reviewed. These UWL wells (labeled “DG-xx”) were installed in 2008 and sampled on multiple occasions prior to the receipt of CCR at the SCPD and adjacent CCR units (SCPC and SCL4A). The DG-xx monitoring wells are screened at approximately the same depth as TMW-5 in the shallow zone of the alluvial aquifer. **Figure 7** displays a box and whisker plot of the sulfate concentrations within the alluvial aquifer prior to the receipt of CCR in the SCPC, SCPD, and SCL4A (prior to 7/30/2010). These plots reflect the high variability of sulfate in the vicinity of the SCPD, prior to any potential impacts from CCR placed in the area. As shown on **Figure 7**, the recent results at TMW-5 are within range of sulfate concentrations at the DG-xx wells prior to CCR placement. Concentrations in these wells range from 11.0 to 83.0 mg/L, with an average of 56.2 mg/L, which is greater than the current sulfate UPL at TMW-5.

5.3.1 Geochemical Signatures

Piper diagrams are useful visual aids for understanding water chemistry and identifying potential sources of geochemical variability both spatially and temporally. **Figure 8** displays a Piper diagram containing all sampling results at TMW-5. A leachate sample collected directly from within the SCPD CCR Unit by Gredell Engineering in December 2023 is also displayed on the diagram, representative of the geochemical signature of the CCR material managed at the SCPD. As displayed in the Piper diagram, results from each sampling event at TMW-5 plot in a tight grouping within the unimpacted background groundwater zone, indicating a lack of CCR impacts at these wells. The SCPD leachate sample plots within the SCPA pore-water zone, distinctly separate from the SCPD wells. Altogether, geochemical signature analysis from the Piper diagram indicates largely similar geochemical signatures between background groundwater and TMW-5, suggesting a lack of groundwater impacts from WFGD materials stored at the SCPD.

The lines of evidence listed above indicate that the sulfate concentration at TMW-5 in November 2023 is not the result of impacts from the SCPD but instead can be attributed to pre-existing impacts and variability in the alluvial aquifer combined with the limited dataset used for the calculation of the sulfate UPL at TMW-5.

6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPD IMPACTS

Based on the information presented in Section 5.0 above, the SSIs reported for boron at UG-2 and sulfate at TMW-5 in November 2023 are not the result of impacts from the SCPD. The SSI for boron at UG-2 is not caused by the SCPD as there are boron impacts in the shallow, intermediate, and deep portions of the alluvial aquifer in this area, and net groundwater flow has been toward the south. The SSI for boron at UG-2 appears to be the result of southward migrating impacts from the SCPA, which is currently in Corrective Action. The SSI for sulfate at TMW-5 was also not caused by impacts from the SCPD and is attributable to natural geochemical variability in the alluvial aquifer. This is supported by highly variable sulfate concentrations at nearby wells that pre-date CCR placement in the area, concentrations below background wells, and the geochemical signature of TMW-5 being largely similar to unimpacted background groundwater. Along with these lines of evidence listed above, the SCPD is documented to be constructed with an engineered compacted clay liner overlain by a 60-mil HDPE geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts.

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WSP USA Inc., 2022, Initial Detection Monitoring Upper Prediction Limits Using Baseline Sampling Data – Utility Waste Landfill Cell 2 (SCPD), Sioux Energy Center, St. Charles Count, Missouri.

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Tables

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

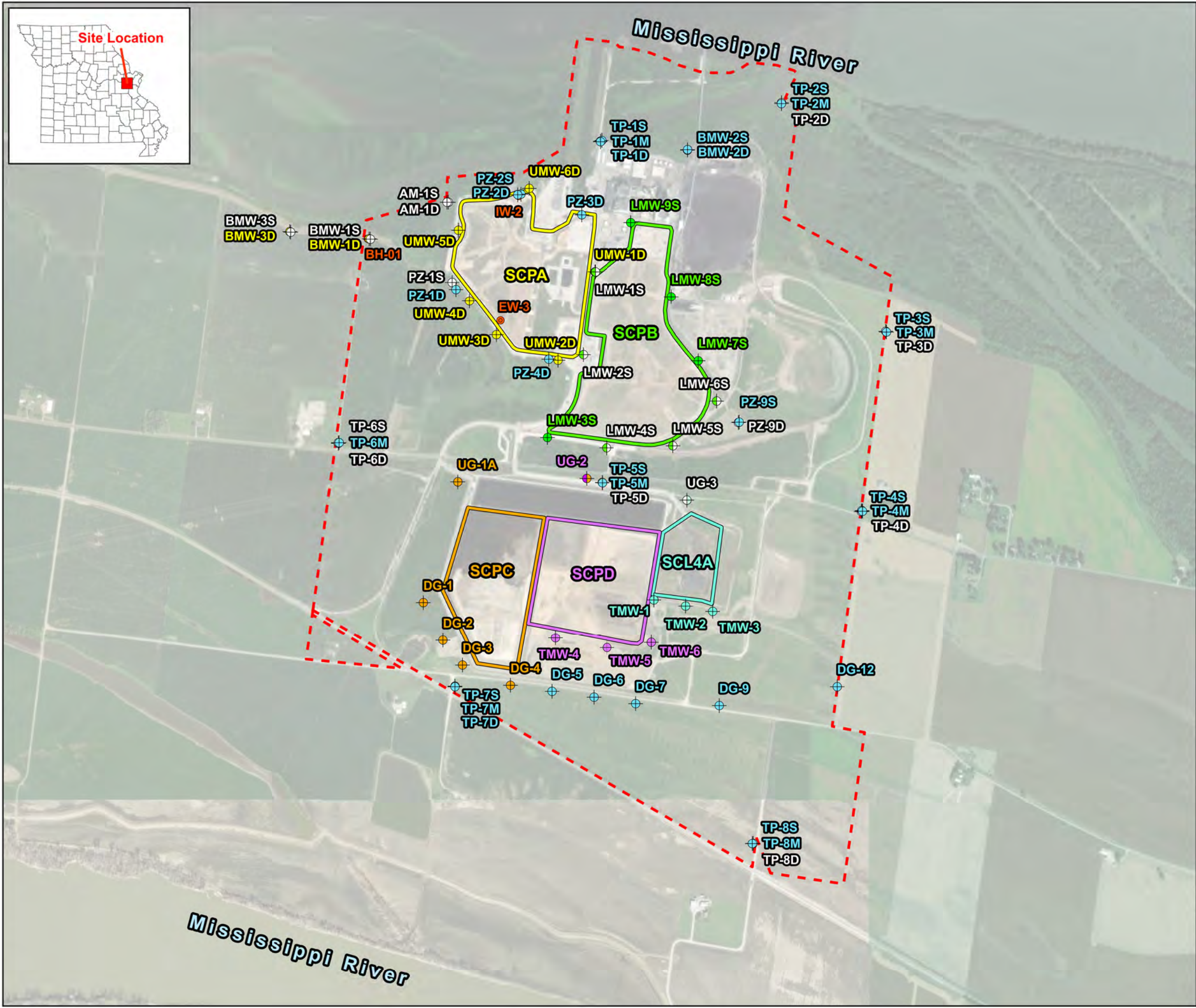
		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
November 2023 Detection Monitoring Event											
DATE	NA	11/10/2023	11/10/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023	NA	11/13/2023
pH	SU	7.04	7.14	6.29 - 7.5	7.10	6.585-7.26	7.06	6.642-7.223	6.95	6.59-7.093	6.95
BORON, TOTAL	µg/L	57.9 J	58.9 J	277.7	1,700	122.2	93.7 J	116.0	93.3 J	131.8	120
CALCIUM, TOTAL	µg/L	136,000	114,000	143,772	119,000	146,033	117,000 J	156,060	132,000	179,541	134,000
CHLORIDE, TOTAL	mg/L	7.2	13.4	93.74	12.9 J	3.216	2.0 J	2.435	1.4 J	11.02	2.0 J
FLUORIDE, TOTAL	mg/L	ND	ND	0.34	ND	0.48	ND	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	46.9	12.3	93.63	0.79 J	44.43	44.3 J	46.12	50.0 J	51.85	36.0 J
TOTAL DISSOLVED SOLIDS	mg/L	475	398	657.3	483	571	451	600.6	516	719.8	542
February 2024 Verification Sampling Event											
DATE	NA				2/7/2024				2/7/2024		
pH	SU										
BORON, TOTAL	µg/L				1,360						
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L								72.8		
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. 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

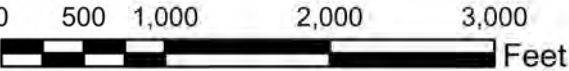


SIoux ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

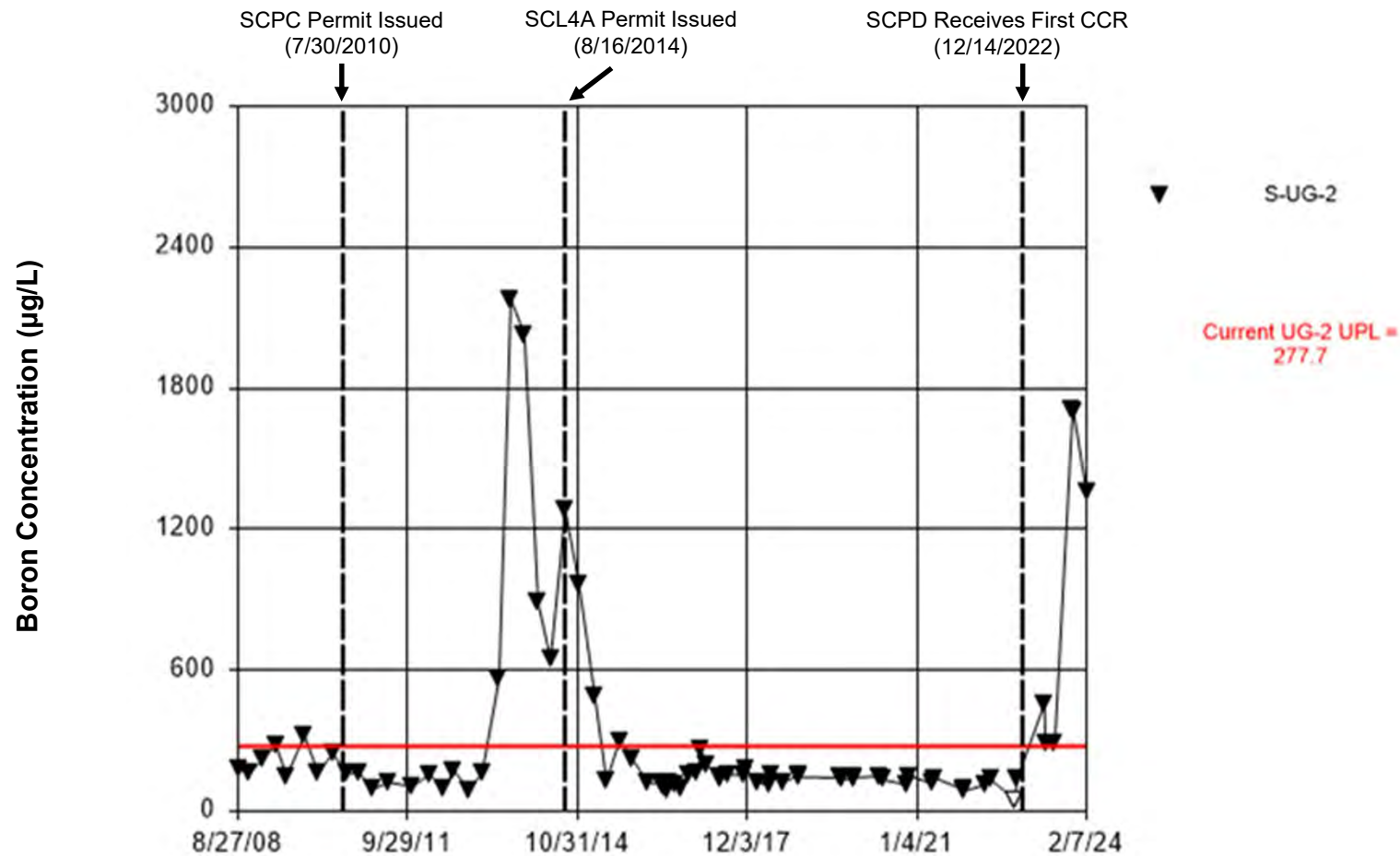
- Legend**
- Sioux Energy Center Property Boundary
 - CCR Units**
 - SCPA - Bottom Ash Surface Impoundment (Closed)
 - SCPB - Fly Ash Surface Impoundment (Closed)
 - Utility Waste Landfill Cells**
 - SCL4A - Dry CCR Disposal Area
 - SCPC- Inactive FGD Surface Impoundment
 - SCPD - FGD Surface Impoundment
 - 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**
- All boundaries and locations are approximate.
 - FGD - Flue Gas Desulfurization.
 - CCR - Coal Combustion Residuals.

- REFERENCES**
- Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.



PROJECT CCR RULE GROUNDWATER MONITORING PROGRAM			
CLIENT AMEREN MISSOURI SIoux ENERGY CENTER			
	DESIGN	JSI	YYYY-MM-DD 2023-03-29
	PREPARED	JSI	PROJECT No. 23009
	REVIEW	GTM	
	APPROVED	MNH	
			FIGURE 1



Notes

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

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2024-06-18



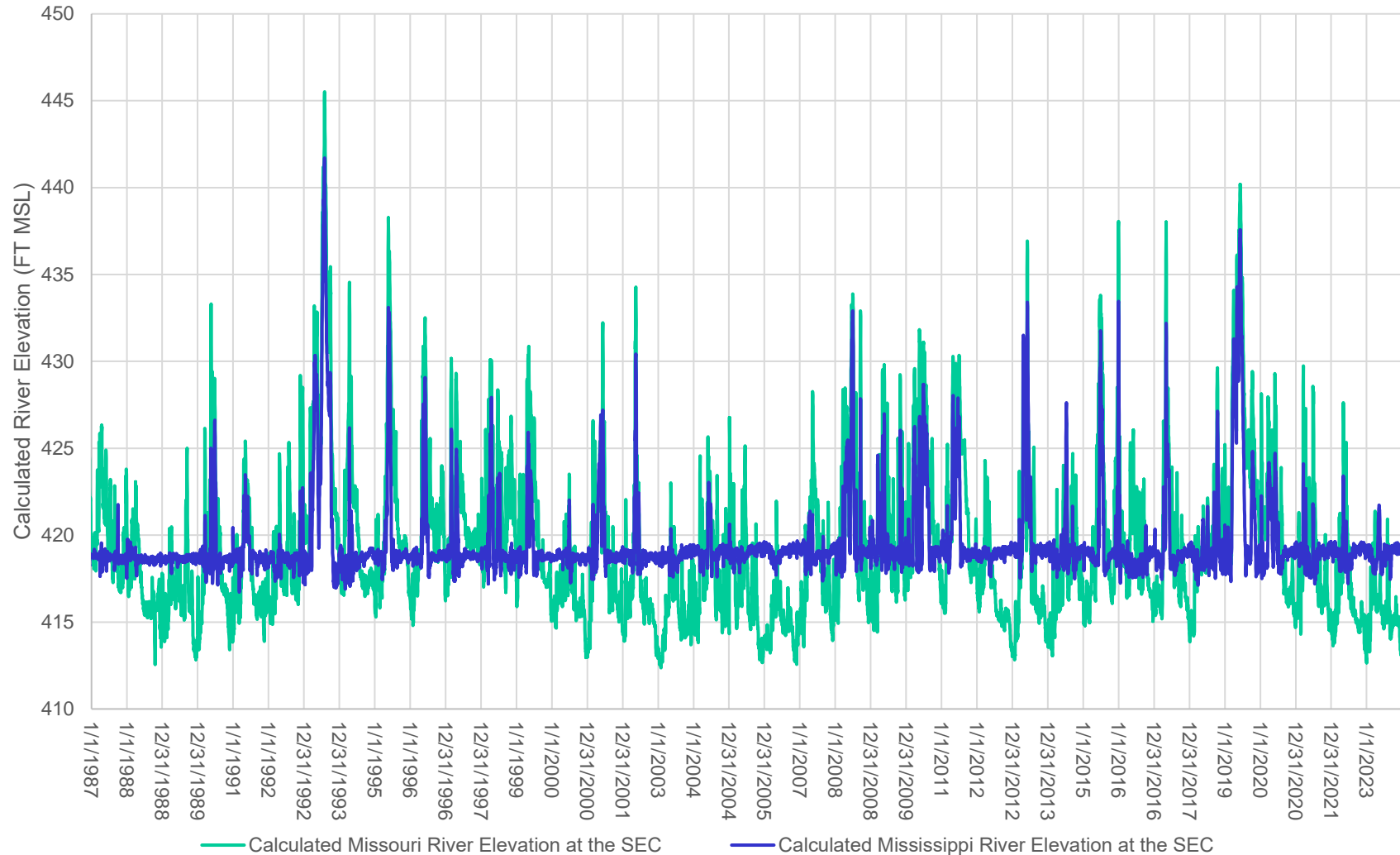
TITLE **Timeseries Plot of Boron Concentrations at
UG-2**

Rev No.
NA

JOB NO.
23009-24

FIGURE **2**

Calculated Mississippi and Missouri River Elevations at the SEC



Notes

- 1) River levels calculated based on USGS river gauge values near the SEC.

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2024-06-18



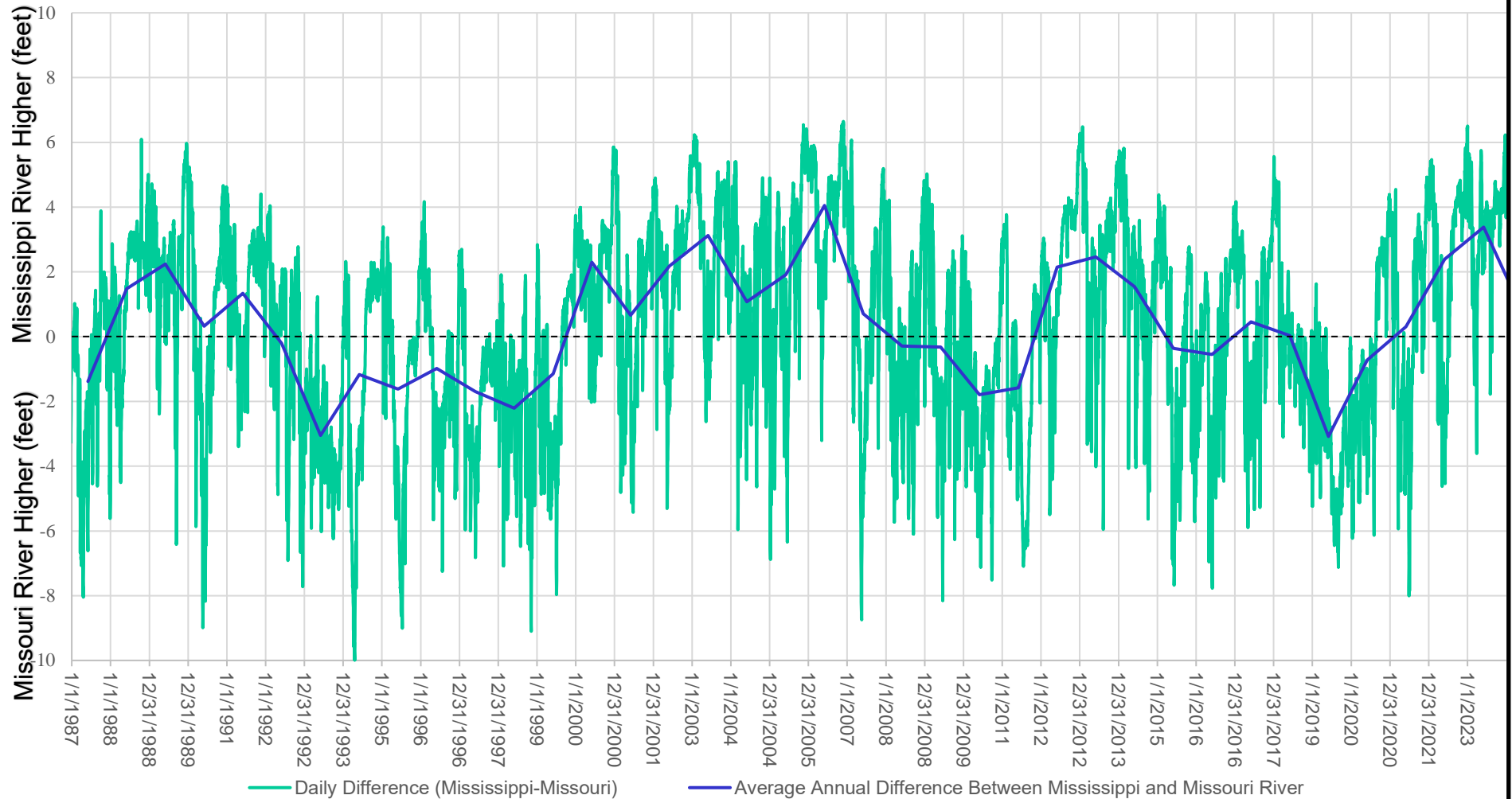
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Rev No.
NA

JOB NO.
23009-24

FIGURE **3**

Difference in Feet Between Mississippi and Missouri River Elevations at the SEC



Notes

- Results in feet, values displays Mississippi River Elevation minus the Missouri River Elevation. Negative results indicate higher Missouri River, positive results indicate higher Mississippi River elevation.

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2024-06-18



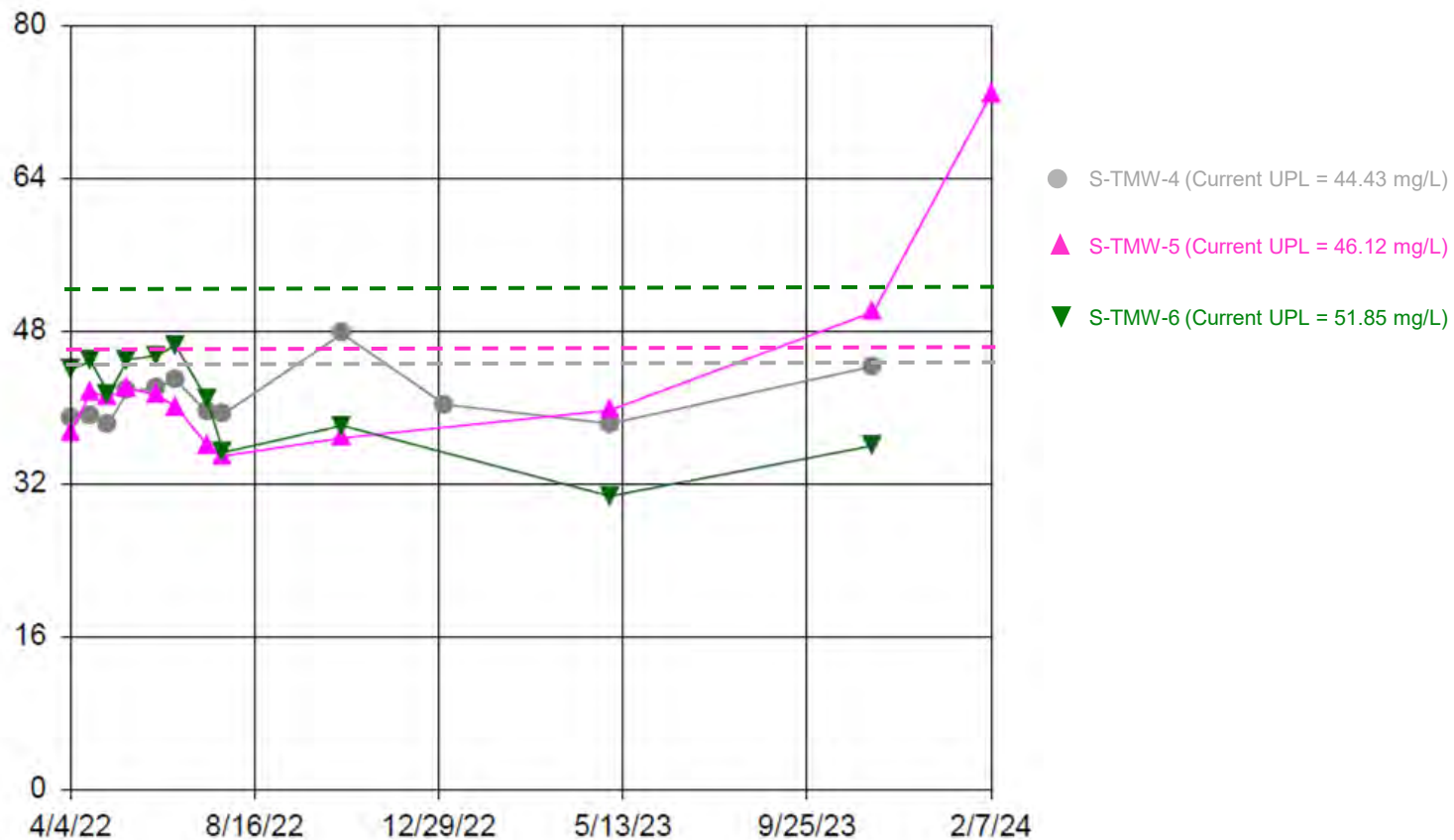
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JOB NO.
23009

FIGURE **4**

Sulfate Concentration (mg/L)



Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) UWL – Utility Waste Landfill.
- 4) CCR – Coal Combustion Residuals.

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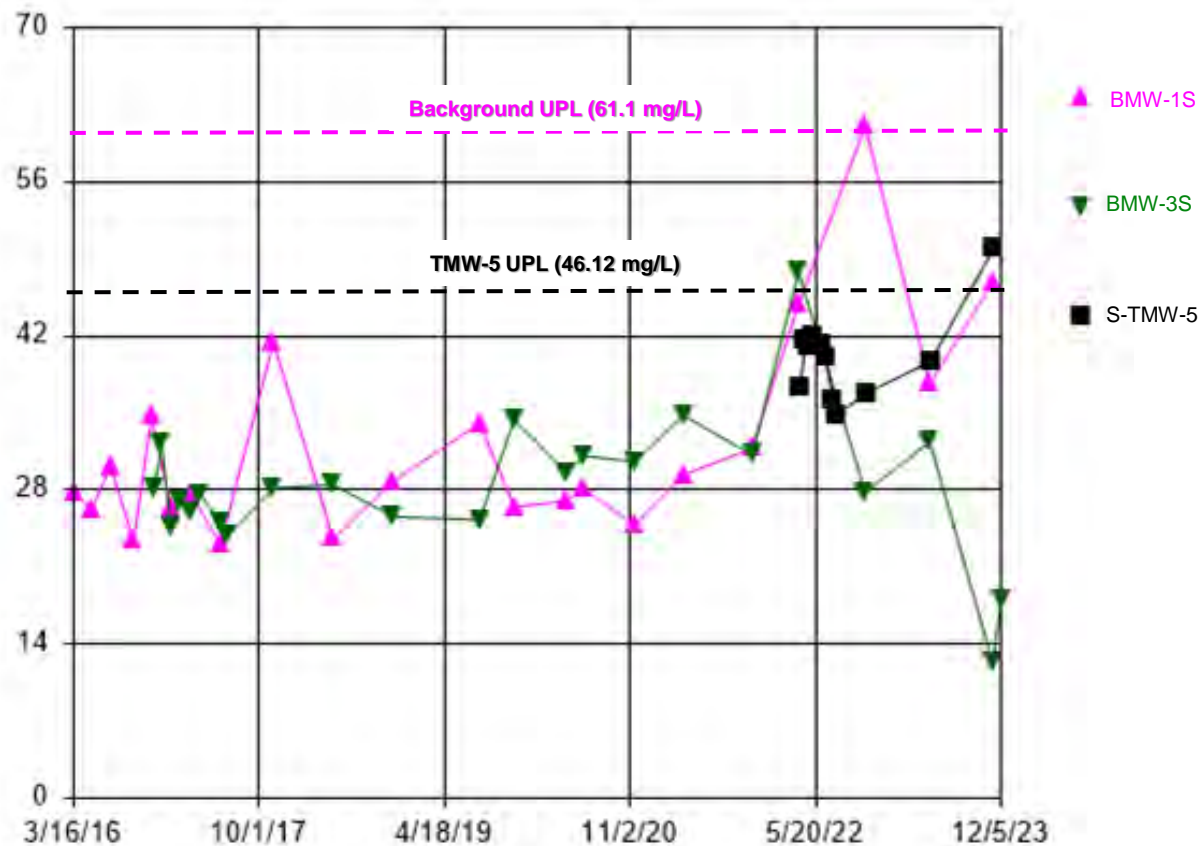
TITLE **Timeseries Plot of Sulfate Concentrations
at Downgradient SCPD Wells**

Rev No.
NA

JOB NO.
23009-24

FIGURE **5**

Sulfate Concentration (mg/L)



Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) UWL – Utility Waste Landfill.
- 4) CCR – Coal Combustion Residuals.

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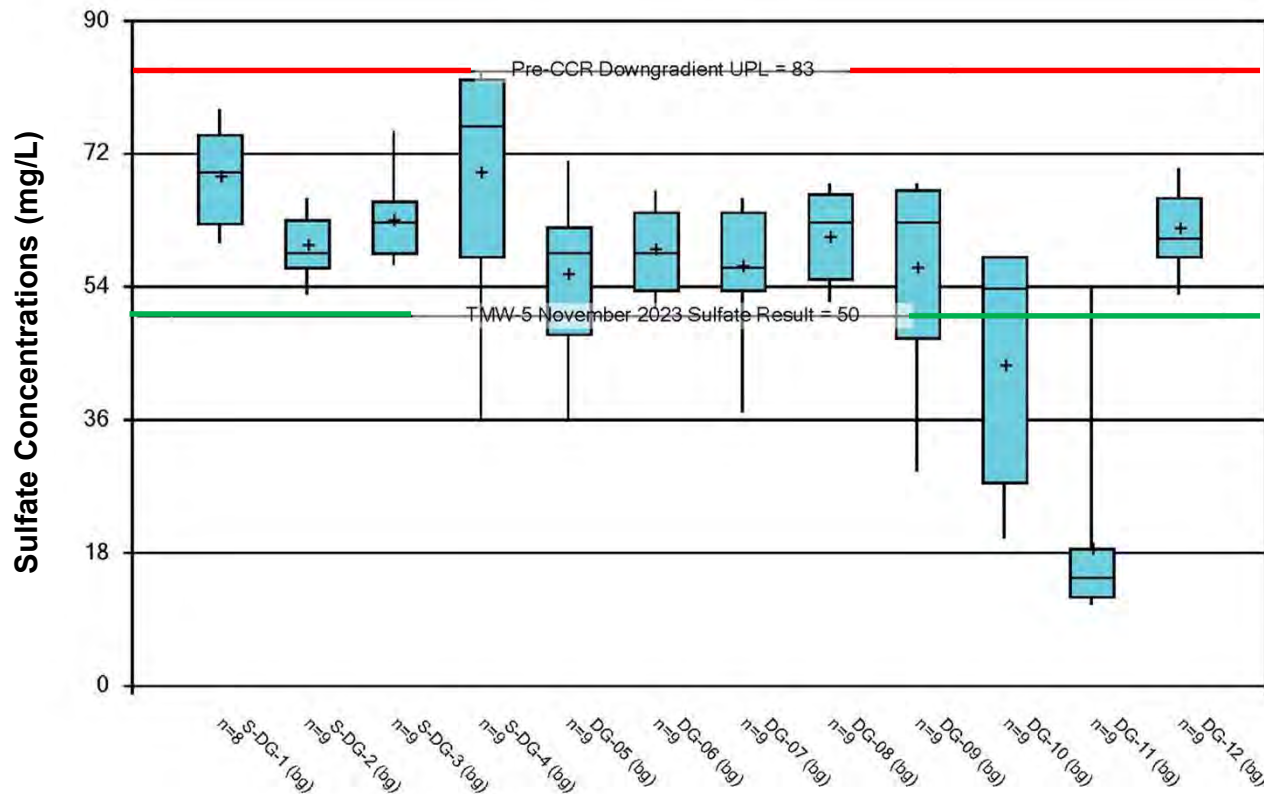
TITLE **Timeseries Plot of Sulfate Concentrations
at TMW-5 and Background Wells**

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NA

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23009-24

FIGURE **6**

Box & Whiskers Plot



**Pre-CCR Downgradient
UPL (83.0 mg/L)**

**TMW-5 November 2023 Sulfate
Result (50.0 J mg/L)**

Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.
- 4) UWL – Utility Waste Landfill
- 5) J – Result is an estimated value.

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TITLE **Pre-CCR Placement Sulfate Concentrations –
State UWL Downgradient Monitoring Wells**

Rev No.
NA

JOB NO.
23009-24

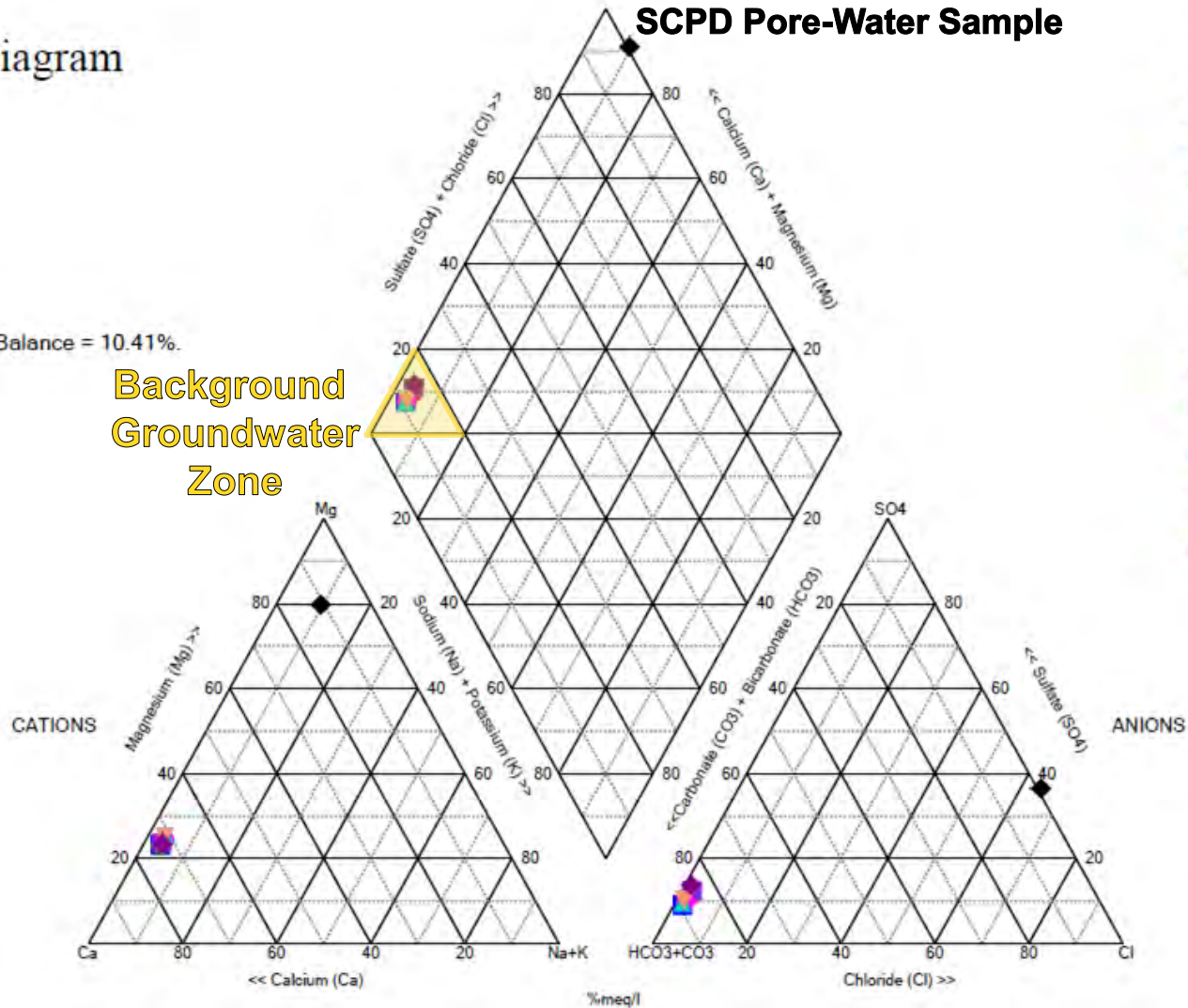
FIGURE **7**

Piper Diagram

SCPD Pore-Water Sample

Cation-Anion Balance = 10.41%.

Background
Groundwater
Zone



Notes

- 1) Piper diagram generated using Sanitas Software.
- 2) %mEq/l – milliequivalents per liter
- 3) LEACH – SCPD Leachate sample collected by Gredell Engineering in December 2023.

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TITLE
TMW-5 and SCPD Leachate Piper Diagram

Rev No.
NA

JOB NO.
23009-24

FIGURE
8

Appendix C

Alternative Source Demonstration – May 2024 Sampling Event

REPORT

SCPD – Alternative Source Demonstration

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

January 3, 2025

Project Number: 23009-24

Submitted to:



Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

Submitted by:



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



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TABLES

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Table 2 – Review of Statistically Significant Increase (Embedded in Text)

Table 3 – Types of CCR and Typical Indicator Parameters (Embedded in Text)

Table 4 – Summary of FGD Impact Indicator Parameters at the Sioux Energy Center (Embedded in Text)

FIGURES

Figure 1 – Sioux Energy Center Groundwater Monitoring Programs and Sample Location Map

Figure 2 – Timeseries Plot of Boron Concentrations at Downgradient SCPD Wells

Figure 3 – Timeseries Plot of Fluoride Concentrations at Downgradient SCPD Wells

Figure 4 – Timeseries Plot of Chloride Concentrations at Downgradient SCPD Wells

Figure 5 – Timeseries Plot of Sulfate Concentrations at Downgradient SCPD Wells

Figure 6 – Timeseries Plot of Calcium Concentrations at Downgradient SCPD Wells

Figure 7 – Pre-CCR Placement Chloride Concentration – State UWL Downgradient Monitoring Wells

Figure 8 – Pre-CCR Placement Sulfate Concentration – State UWL Downgradient Monitoring Wells

1.0 CERTIFICATION STATEMENT

This SCPD – *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 SCPD – *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 SCPD – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for two Statistically Significant Increase (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPD (Cell 2). This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSIs were 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 SCPD. The SEC is approximately 1,025 acres and is located in the floodplain between the Mississippi and Missouri Rivers. The SEC is bounded to the north by wooded areas associated with the Mississippi River; to the south by a railroad; and to the east and west by agricultural fields.

3.1 Geological and Hydrogeological Setting

Hydrogeologically, the SCPD lies between the Mississippi River to the north and the Missouri River to the south. Flow and deposition from these rivers have resulted in thick alluvial deposits that lie unconformably on top of bedrock. These alluvial deposits range from approximately 100 to 130 feet in thickness and comprise the uppermost aquifer, called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silt and clay. 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 – SCPD

UWL Cell 2 is referred to by Ameren as the SCPD, or "Gypsum Pond" Cell 2. The SCPD is approximately 36 acres in size and is located south of the generating plant on the south side of Highway 94 (**Figure 1**). The CCR Unit, which began operation on December 14, 2022, manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD).

The WFGD process occurs after the removal of slag and fly ash. A crushed limestone (CaCO_3) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO_2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$)). The resultant gypsum material was formerly wet sluiced from the plant across the highway to the SCPC, and has been wet sluiced to SCPD since December 14, 2022. Once there, the gypsum material is dewatered by gravity, with the sluice conveying recycled water back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens 2014).

The SCPD is bounded immediately on the west by the SCPC surface Impoundment (UWL Cell 1), northeast by the SCL4A landfill cell (UWL Cell 4a), the north by the UWL recycle pond, and south/southeast by low lying agricultural floodplain. The perimeter berm surrounding the SCPD is constructed to an elevation of 446 feet above mean sea level (MSL), which is approximately 5 feet above 100-year flood elevation of 441.2 feet MSL and about 12 to 18 feet above the surrounding low-lying farmland. This berm elevation is equivalent to the adjacent SCPC, SCL4A, and UWL recycle pond areas. Additionally, the SCPD is lined with a bottom composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1×10^{-7} centimeters per second (cm/sec) overlain by a 60-mil flexible high-density polyethylene (HDPE) geomembrane liner. This liner system has a base elevation (top of liner/base of CCR) of approximately 432 feet MSL at its lowest point.

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 seasonally low elevation for groundwater. Quarterly groundwater samples have been collected in these monitoring wells since June 2008 for the Missouri UWL parameters. Placement of WFGD materials in the SCPD started on December 14, 2022.

3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, prior to the initial receipt of CCR on December 14, 2022 the following were completed: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPD consists of six monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. One monitoring well (UG-2) was installed by Gredell Engineering Resources, Inc. (Gredell) in December 2007 as a part of the Missouri UWL state monitoring program. This monitoring well is used in both the SCPC and SCPD groundwater monitoring well networks. The background monitoring wells (BMW-1S and BMW-3S) were installed by Golder Associates Inc. (Golder) in 2016 for CCR Rule groundwater monitoring purposes. Three monitoring wells (TMW-4, TMW-5, and TMW-6) were installed in March 2022 to the south and southeast of the SCPD by WSP USA, Inc. (WSP) specifically for CCR groundwater monitoring of the SCPD. More information on the design and installation of the monitoring wells is provided in the SCPD GMP (WSP 2022) and the SCPD 2022 Annual Report (WSP 2023).

Between May 2016 and June 2017, eight baseline sampling events were completed for the existing monitoring wells used to monitor the SCPD (UG-2, BMW-1S, and BMW-3S). Eight baseline sampling events were also completed between March and October of 2022 for TMW-4, TMW-5, and TMW-6. After baseline sampling, the first Detection Monitoring event was completed in May 2023. The following Appendix III constituents were analyzed during Detection Monitoring:

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

In January 2023, background results from the eight baseline sampling events were used to calculate statistical upper prediction limits (UPLs) for wells TMW-1, TMW-2, and TMW-3. Since monitoring well UG-2 is included in both the SCPC and SCPD monitoring networks, statistical limits for this well follow those used for SCPC monitoring, which were updated in March 2024 (Rocksmith 2024). These UPLs were then compared to the Detection Monitoring results from the May 2023 sampling event and subsequent sampling events. If a result from the Detection Monitoring event is higher than the calculated UPL, it is classified as an initial exceedance, and a verification sample is then collected and tested in accordance with the SCPD Statistical Analysis Plan (SAP). In May 2024, three initial exceedances were identified: sulfate at TMW-4, sulfate at TMW-5, and chloride at TMW-6. Verification sampling in July 2024 confirmed each initial exceedances as SSIs. Results from this sampling event are provided in **Table 1**.

4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring wells TMW-4, TMW-5, and TMW-6 are screened in the upper portion of the alluvial aquifer, just below the average seasonal low elevation for groundwater. As shown in **Figure 1**, TMW-4 and TMW-5 are located immediately south of the SCPD, and TMW-6 is located adjacent to the southeast corner of the unit. The SCPD is located south of the generating plant, Highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

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

Table 2: Review of Statistically Significant Increases

Constituent	Well ID	Current UPL	Range of Values Prior to May 2024 Sampling Event	May 2024 Result	July 2024 Result
Sulfate (mg/L)	TMW-4	44.43	38.3 – 47.7	73.9 J	69.2 J
Sulfate (mg/L)	TMW-5	46.12	34.9 – 72.8	72.1	64.6
Chloride (mg/L)	TMW-6	11.02	1.3 – 9.6	16.5	28.2 J
Chloride (mg/L)	Background Wells (BMW-1S & BMW-3S)	13.65	6.3 – 13.4	7.2 & 11.1	NS
Sulfate (mg/L)	Background Wells (BMW-1S & BMW-3S)	61.1	12.3 – 61.1	37.7 & 19.7	NS

Notes:

- 1) mg/L – milligrams per liter.
- 2) µg/L – micrograms per liter.
- 3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.
- 4) ND – Non-Detect.
- 5) J – Result is an estimated value.
- 6) NS – Not sampled.

5.0 EVIDENCE OF SSIS FROM ALTERNATIVE SOURCE

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

- Lack of elevated key FGD Indicators (boron, fluoride, calcium) above pre-CCR placement levels at monitoring wells TMW-4, TMW-5, and TMW-6.
- Documentation of pre-existing, low-level concentrations of CCR indicators in groundwater that pre-date the SCPD operation nearby these downgradient monitoring wells.
- Current UPLs for each of these wells were calculated from only eight baseline sampling events, which likely do not capture the full natural geochemical variability of the aquifer.
- Surface conditions in the vicinity of these wells have been variable since their installation and are not representative of conditions during the baseline sampling period.
- Sulfate at TMW-4 in May 2024 was flagged being biased high during data validation procedures.
- Construction documents for the SCPD indicating the 60-mil high-density polyethylene (HDPE) geomembrane liner and a 2-foot thick clay barrier, verified by quality assurance testing during construction.

5.1 CCR Indicators

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

Table 3: Types of CCR and Typical Indicator Parameters

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
Fly Ash	Fine grained, powdery material composed mostly of silica made from the burning of finely ground coal in the boiler.	<ul style="list-style-type: none"> • Boron • Molybdenum • Lithium • Sulfate
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.	<ul style="list-style-type: none"> • Bromide • Potassium • Sodium • Fluoride
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.	<ul style="list-style-type: none"> • 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 SCPD has historically received FGD type wastes that are managed at the SEC.

5.2 Site Specific Key CCR Indicators

To be a key CCR Indicator parameter for a specific site, a constituent should be present in relatively high concentrations in the leachate (CCR porewater) when compared to background or other sources (nearby rivers, etc.), not be a common anthropogenic contaminant, and be mostly non-reactive and mobile in the site hydrogeological environment (EPRI 2012). In 2012, EPRI investigated which constituents are the best indicator parameters for coal ash impacts as outlined in **Table 1**. Of the key indicators listed in **Table 1** for flue gas desulfurization material, sulfate, fluoride, calcium, boron, and chloride are regularly sampled as part of the CCR Rule. Testing for bromide has not been completed at this site.

Table 2 provides a snapshot of the concentrations present onsite in background groundwater, Mississippi River, Missouri River, SCPA porewater, and SCPD leachate for the constituents sampled on the key indicator list for FGD material.

Table 4 – Summary of FGD Impact Indicator Parameters at the Sioux Energy Center

Constituent (Units)		Back-ground	Mississippi River ¹	Missouri River ¹	SCPA Porewater	SCPD Leachate	Advantages and Caveats as Key Indicator (from EPRI 2012)
Sulfate (mg/L)	Minimum	12.3	29.9	188	48.5	5,820	High concentrations expected in both washed and unwashed FGD gypsum. Commonly analyzed. Very mobile in all hydrogeologic environments. Less useful in strongly reducing environments where sulfate can be reduced to hydrogen-sulfide gas.
	Average	31.03	34.08	192.1	1,088		
	Maximum	61.1	40.5	196	2,080		
Fluoride (mg/L)	Minimum	ND (<0.086)	0.16	0.43	0.22	68.0	Mobile and non-reactive in common hydrogeologic environments. Assume that leachate concentration is higher than background, particularly for washed gypsum.
	Average	0.2735	0.196	0.4435	1.142		
	Maximum	0.46	0.24	0.46	2.9		
Calcium (µg/L)	Minimum	97,100	42,500	63,000	73,400	911,000	High concentrations expected in both washed and unwashed FGD gypsum. Understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations.
	Average	129,001	50,255	64,385	409,680		
	Maximum	184,000	58,500	65,400	825,000		
Boron (µg/L)	Minimum	42.4	27.1	110	348	239,000	Mobile indicator constituent for unwashed FGD gypsum. Concentrations for washed gypsum may be too low to be useful.
	Average	94.05	36.4	112.3	53,266		
	Maximum	240	59.9	117	111,000		
Chloride (mg/L)	Minimum	1.9	22.2	23.3	20.5	7,390	Mobile indicator constituent for unwashed FGD gypsum. Concentrations may be very high if transport water is recirculated. Concentrations for washed gypsum may be too low to be useful.
	Average	8.625	27.06	23.48	24.34		
	Maximum	16.8	41.0	23.9	27.1		

Notes:

- 1) Unit abbreviations - mg/L – milligrams per liter, µg/L – micrograms per liter
- 2) ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
- 3) SCPA porewater samples collected by Golder Associates in January 2018.
- 4) A single leachate sample was collected directly from the SCPD by Gredell Engineering Resources, Inc. in December 2023. The SCPD currently collects WFGD material that was once sluiced to the SCPC until December 2022.

Boron has previously been attributed as a primary indicator for CCR impacts at the site, particularly for bottom and fly ash impacts. As shown in **Table 2**, the FGD leachate material contained in the SCPC (as well as the adjacent SCPD) contains significantly higher concentrations of key indicator parameters than other potential sources at the SEC. The following describes the practicality of each of the key FGD indicators for determining CCR impacts from the SCPC:

- Boron, which is typically the most mobile of CCR-related constituents, would be expected to have the most notable increase if there were impacts from the SCPC/SCPD. Of the key FGD indicators listed above, the boron concentration in SCPD leachate is greatest relative to background groundwater at the site (2,541 times higher concentration in SCPD leachate than average background groundwater). Other key FGD indicators are lower in terms of their relative concentrations in leachate compared to background groundwater. Additionally, boron has low concentrations in the adjacent Missouri and Mississippi Rivers;

¹ Mississippi and Missouri River samples collected September 21 & 22, 2017 and May 8, 2018. Results are available on Ameren's public website at <https://www.ameren.com/company/environment-and-sustainability/managing-coal-combustion/ccr-compliance-reports/sioux-energy-center>.

therefore, elevated boron is likely from a CCR unit, whether it be the SCPA, SCPB, SCPC, SCPD, or SCL4A.

- Fluoride may be a very good FDG indicator parameter because it is typically mobile in most geological environments and is present in SCPD leachate at a level 248 times greater than average background groundwater concentrations. Background fluoride concentrations are also similar to Mississippi and Missouri River concentrations; therefore, an apparent source of increased fluoride could be from FGD impacts. Fluoride concentrations are also much higher in FGD leachate than SCPA porewater, indicating that if increased fluoride is occurring, it would be suspected that the impacts may be from FGD and not fly ash or bottom ash as managed by the SCPA.
- Chloride may be a good FGD indicator parameter because it is mobile in most geological environments and is present in SCPD leachate at a level 856 times greater than average background groundwater concentrations. However, chloride concentrations can be greatly affected by the use of road salt (NaCl) for road deicing. Chloride concentrations for the DG-xx wells installed south of the UWL were measured as high as 125 mg/L prior to any placement of CCR materials in the UWL (prior to June 30, 2010). Additionally, surface water samples collected from the Mississippi and Missouri Rivers near the SEC average approximately 27 and 23 mg/L of chloride, respectively. Therefore, if chloride concentrations are significantly greater than those other alternative sources (greater than approximately 125 mg/L), then chloride can be a good indicator parameter for FGD impacts. At concentrations lower than this, chloride is less effective as a FGD indicator at the SEC.
- Sulfate may be a good FGD indicator parameter as well because it is mobile in most geological environments and is present at a level 187 times greater than average background groundwater concentrations. However, based on surface water sampling near the SEC, sulfate concentrations in the Mississippi and Missouri Rivers reach up to approximately 196 mg/L. Therefore, if sulfate concentrations are significantly greater than concentrations in the nearby rivers and background groundwater (greater than approximately 200 mg/L), then it may be a good indicator for CCR indicator for fly ash, bottom ash, or FGD impacts. At concentrations lower than this, sulfate is less effective as an FGD indicator at the SEC.
- Calcium may be a useful FDG Indicator parameter; however, it is not always mobile in all geological environments and an understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations. Additionally, calcium concentrations are only 7 times greater in the FGD leachate than average background groundwater at the site. Significant increases in calcium may indicate an FGD impact; however, increases would be expected to be less notable than other key indicators, such as boron and fluoride.

5.3 Concentrations of Key FGD Indicators in Monitoring Wells with SSI

The SCPC was permitted to receive FGD material beginning in July 2010, and receipt of FGD material ceased on December 14, 2022, when the SCPD began receiving FGD material. Monitoring wells TMW-4, TMW-5, and TMW-6 were installed in March of 2022 and since that time, concentrations of boron, fluoride and calcium, key FGD indicators have remained steady or decreased. **Figures 2-6** display historical concentrations of each of the key indicator parameters of FGD impacts at downgradient SCPD monitoring wells. As displayed in the figures, TMW-4, TMW-5, and TMW-6 do not show increases in the two most effective FGD indicators at the site (boron and fluoride) following receipt of CCR in the SCPD. This behavior of key FGD indicators at each of these wells is strong evidence that impacts from the SCPD are not occurring, and a source other than CCR is likely the cause of the SSIs.

5.4 Evaluation of SSIs

5.4.1 Evaluation of the Statistically Significant Increase of Chloride at TMW-6

As discussed in Section 5.2, chloride can be a good indicator of FGD impacts to groundwater, especially when concentrations are significantly greater than those present in the Mississippi and Missouri Rivers (up to approximately 27 mg/L) and are greater than those present from road salt application impacts (greater than approximately 125 mg/L). The nearest public roadways to TMW-4, TMW-5, and TMW-6 are Highway 94, approximately 2,000 feet to the north, and Dwiggin Road, approximately 500 feet to the south. A paved CCR haul road also exits to the north of UWL area, just south of Highway 94. Since the beginning of SCPD construction in 2022, there have been significant disturbances to surface conditions in the vicinity of these wells.

Image Inset – Google Earth Image from June 5, 2023



Image Inset – Google Earth Image from April 16, 2024



Equipment and material haul roads were built to the south and east of the SCPD in 2022, as well as a gravel parking lot to the south of the unit (shown inset aerial image taken 6/5/2023). In late 2023, a temporary gravel road associated closure of the SCPC and construction of the SCPD was built directly south of TMW-4 and TMW-5 (shown in the inset aerial image taken 4/16/2024). As of November 2024, the gravel road, parking lot, and temporary haul roads no longer exist; however, a permanent gravel road now exists inside the perimeter fence surrounding the SCPD, at the toe of the berm. Since the installation of these wells, surface conditions in their vicinity have been variable, and are not representative of surface conditions during baseline sampling. These changing surface conditions may contribute to geochemical variability observed within these shallow monitoring wells installed at an approximate depth of only 30 feet.

In May 2024, the chloride concentration at TMW-6 was 15.5 mg/L, and the concentration measured during the July 2024 verification sampling event was 28.2 mg/L. These values are just above the original calculated UPL of 11.02 for chloride, which was calculated based on eight baseline sampling events in 2022, during which time concentrations ranged from 1.3 to 9.6 mg/L. There has not yet been a background update for TMW-6 as the May 2024 sampling event was only the third detection monitoring sampling event since the original limit was calculated.

Chloride concentrations in shallow alluvial background monitoring wells located approximately 1 mile to the northwest of the SCPD (BMW-1S and BMW-3S) have ranged from 6.3 to 14.2 mg/L since their installation in 2016, with outliers at BMW-1S of 1.9 and 16.8 mg/L, and at BMW-3S at 7.6 mg/L. Based on baseline sampling, the initial background UPL for chloride was 12.34 mg/L at these shallow background wells. The current 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. Chloride results through May 2024 at TMW-6 were similar to background concentrations; however, the result from the July verification sampling event is higher. As of this report, data from the November 2024 sampling event is available, and chloride was measured at only 5.1 mg/L on 11/19/2024. This result is well below the current UPL for chloride at TMW-6 and is evidence of the high chloride variability at this well. **Figure 4** displays the greater variability in chloride concentrations at TMW-6 compared to other downgradient SCPD monitoring wells, and the increased concentrations in May and July 2024 do not correspond with CCR placement in the SCPD.

To further investigate the geochemical variability of chloride 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 from 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. Each of these DG-xx monitoring wells are screened at approximately the same depth as TMW-6 in the shallow zone of the alluvial aquifer. **Figure 7** displays a box and whisker plot of the chloride concentrations for the DG-xx wells prior to the receipt of FGD in the SCPC (any CCR placement south of Highway 94). This figure shows notable variability in local groundwater chemistry that pre-dates CCR placement in the area. As displayed in **Figure 7**, May and July 2024 sampling results at TMW-6 are well within historical concentration ranges of many DG-xx wells, the closest of which is approximately 700 feet to the south.

This significant pre-CCR variability in chloride concentration near TMW-6 is evidence that the current intrawell UPL for calcium at TMW-6 does not completely account for the natural geochemical variability within the aquifer. As the downgradient SCPD wells were installed in 2022, there has been a limited number of results at these wells over a relatively short period of time. UPLs for these wells were calculated based on 8 initial sampling events over the course of only seven months, which is likely not a long enough time period to capture the full natural variability of the aquifer.

5.4.2 Evaluation of the Statistically Significant Increase of Sulfate at TMW-4 and TMW-5

As discussed in Section 5.3, sulfate may be a good FGD indicator parameter because it is mobile in most geological environments; however, based on surface water sampling near the SEC, sulfate concentrations in the Mississippi and Missouri Rivers were measured as high as approximately 196 mg/L. Therefore, if sulfate concentrations are significantly greater than concentrations in nearby rivers and background groundwater (greater than approximately 200 mg/L), then it may be a good indicator for CCR indicator for fly ash, bottom ash, or FGD

impacts. At concentrations lower than this, sulfate is less effective as an FGD indicator at the SEC, as there are naturally occurring concentrations in a similar range interacting with the local alluvial aquifer.

The time series plot on **Figure 5** shows variability in sulfate concentrations at the TMW wells south of the SCPD since the onset of baseline monitoring. As displayed in the figure, sulfate concentrations ranged from 34.9 to 42.0 mg/L during the eight baseline sampling events at TMW-5 and from 38.3 to 47.7 mg/L at TMW-4. Baseline sampling was completed within a 7-month period from April 2022 through October 2022. Since the completion of baseline sampling, sulfate has ranged from 38.3 to 73.9 mg/L at TMW-4 and 39.7 to 72.9 mg/L at TMW-5.

Figure 8 displays a box and whisker plot of the sulfate concentrations observed at the DG-xx wells prior to the receipt of CCR in the SCPD, SCPD, and SCL4A (prior to 7/30/2010). These plots reflect the high variability of sulfate in the vicinity of the SCPD, prior to any potential impacts from CCR placed in the area. As shown in **Figure 8**, the recent results at TMW-4 and TMW-5 are within range of sulfate concentrations at the DG-xx wells prior to CCR placement. Concentrations in these wells range from 11.0 to 83.0 mg/L, which is greater than the current sulfate UPLs at TMW-4 and TMW-5.

Based on these data, the variability in sulfate concentrations observed at downgradient monitoring wells over time is not a result of SCPD CCR influence on surrounding groundwater. Additionally, sulfate concentrations within the Missouri River to the south of the SEC averaged approximately 192 mg/L, as shown in **Table 2**, which is significantly greater than the sulfate SSIs at TMW-4 and TMW-5. The Missouri River is a potential alternative source of sulfate to the groundwater at the SEC and likely contributes to the sulfate variability at the site, especially during times of northward flow from the Missouri River towards the Mississippi River. The SSI for sulfate is likely a result of geochemical variability of the aquifer that has not been captured by groundwater sampling to-date.

In addition to the natural variability discussed above, during data validation procedures for the May 2024 detection monitoring event, the sulfate result at TMW-4 was flagged as an estimate (J+), indicating that the result may be biased high. At the time of sampling, additional sample volume was collected at the well for matrix spike (MS) and matrix spike duplicate (MSD) samples in accordance with quality assurance and quality control (QA/QC) procedures specified in the GMP for the SCPD. The laboratory data packet notes that MS and MSD recoveries associated with sulfate analysis at TMW-4 greatly exceeded control limits established by the laboratory. Therefore, the reported sulfate concentration at TMW-4 may be greater than the true concentration present in the well at that time.

6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPD IMPACTS

Based on the information presented in Section 5.0 above, the SSIs reported for chloride at TMW-6 and sulfate at TMW-5 and TMW-6 in the May 2024 sampling event are not the result of impacts from the SCPD. The following lines of evidence support this conclusion:

- Key FGD indicator parameters such as boron, fluoride and calcium are not elevated when comparing pre-CCR sampling results with current results.
- Variable sulfate and chloride concentrations that are greater than those at TMW-4, TMW-5, and TMW-6 exist immediately to the south, southwest, and southeast of TMW-4, TMW-5, and TMW-6, which predate CCR placement in the UWL (prior to June 30, 2014).
- Current UPLs for each of these wells were calculated from only eight baseline sampling events, which likely do not capture the full natural geochemical variability of the aquifer.
- Significant changes to the ground surface and groundwater recharge in the area of TMW-4, TMW-5, and TMW-6 with the installation of the SCPD and various haul roads in the past three years.

- Based on data validation procedures, the reported May 2024 sulfate result at TMW-4 may be biased higher than the true concentration at that time.

Along with these lines of evidence listed above, the SCPD is lined with a bottom composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1×10^{-7} centimeters per second (cm/sec) overlain by a 60-mil flexible high-density polyethylene (HDPE) geomembrane liner which was designed and constructed to properly contain CCR and prevent groundwater impacts.

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Tables

Table 1
May 2024 Detection Monitoring Results
SCPD Surface Impoundment
Sioux Energy Center, St. Charles County, MO

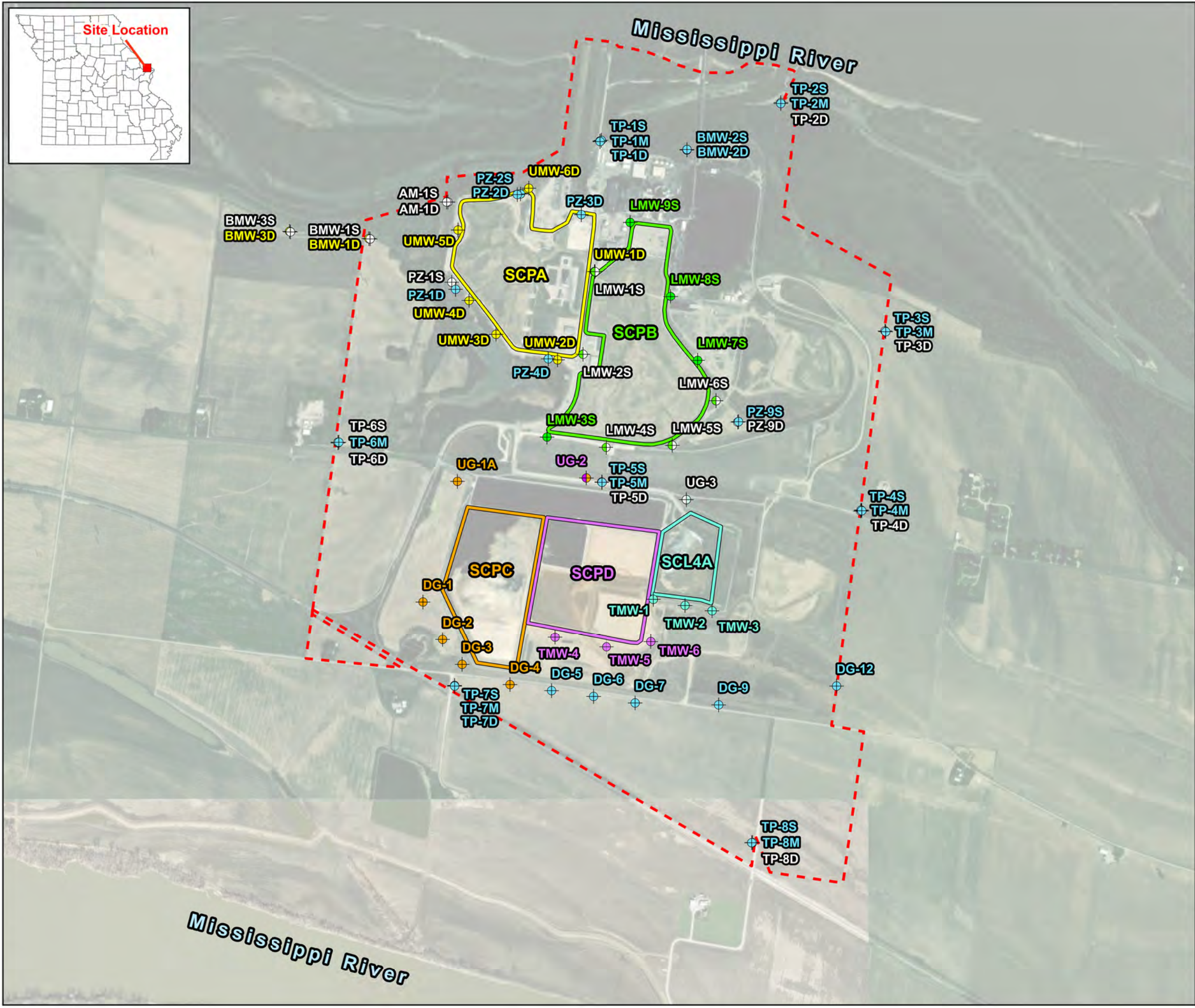
		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-2	UG-2	Prediction Limit TMW-4	TMW-4	Prediction Limit TMW-5	TMW-5	Prediction Limit TMW-6	TMW-6
May 2024 Detection Monitoring Event											
DATE	NA	5/28/2024	5/28/2024	NA	5/28/2024	NA	5/29/2024	NA	5/29/2024	NA	5/29/2024
pH	SU	6.86	6.95	6.29 - 7.50	7.04	6.585-7.26	7.16	6.642-7.223	7.02	6.59-7.093	6.88
BORON, TOTAL	µg/L	58.1 J	54.1 J	277.7	143	122.2	74.9 J	116.0	81.3 J	131.8	93.5 J
CALCIUM, TOTAL	µg/L	133,000	116,000	143,772	87,100	146,033	96,800	156,060	109,000	179,541	143,000
CHLORIDE, TOTAL	mg/L	10.1	11.1	93.74	6.7	3.216	2.1 J	2.435	1.6	11.02	16.5
FLUORIDE, TOTAL	mg/L	ND	ND	0.34	ND	0.48	0.16 J	0.6744	ND	0.37	ND
SULFATE, TOTAL	mg/L	37.7	19.7	93.63	35.8	44.43	73.9 J	46.12	72.1	51.85	45.8
TOTAL DISSOLVED SOLIDS	mg/L	470	529	657.3	335	571	381	600.6	403	719.8	499
July 2024 Verification Sampling Event											
DATE	NA						7/29/2024		7/29/2024		7/29/2024
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L										
CHLORIDE, TOTAL	mg/L										28.2 J
FLUORIDE, TOTAL	mg/L										
SULFATE, TOTAL	mg/L						69.2 J		64.6		
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. 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

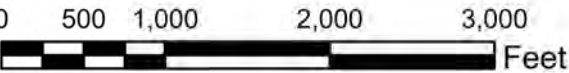


SIoux ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

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

- REFERENCES**
- Ameren Missouri Sioux Energy Center, Sioux Property Control Map, February 2011.



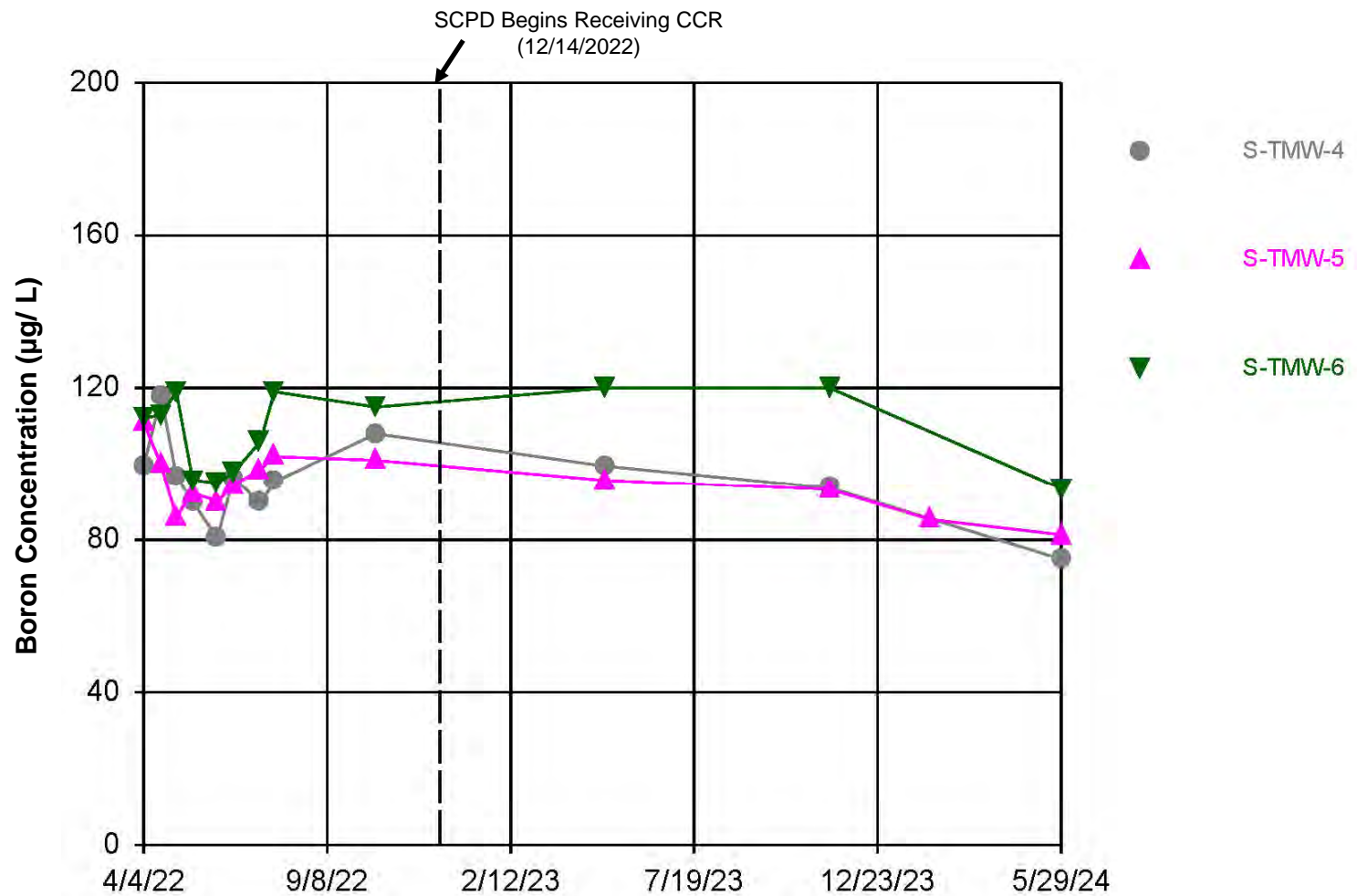
PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIoux ENERGY CENTER



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

FIGURE 1



Notes

- 1) µg/L – Micrograms per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT
**AMEREN MISSOURI
SIOUX ENERGY CENTER**



DRAWN
JSI

CHECKED
GTM

REVIEWED
MNH

DATE
2024-12-30

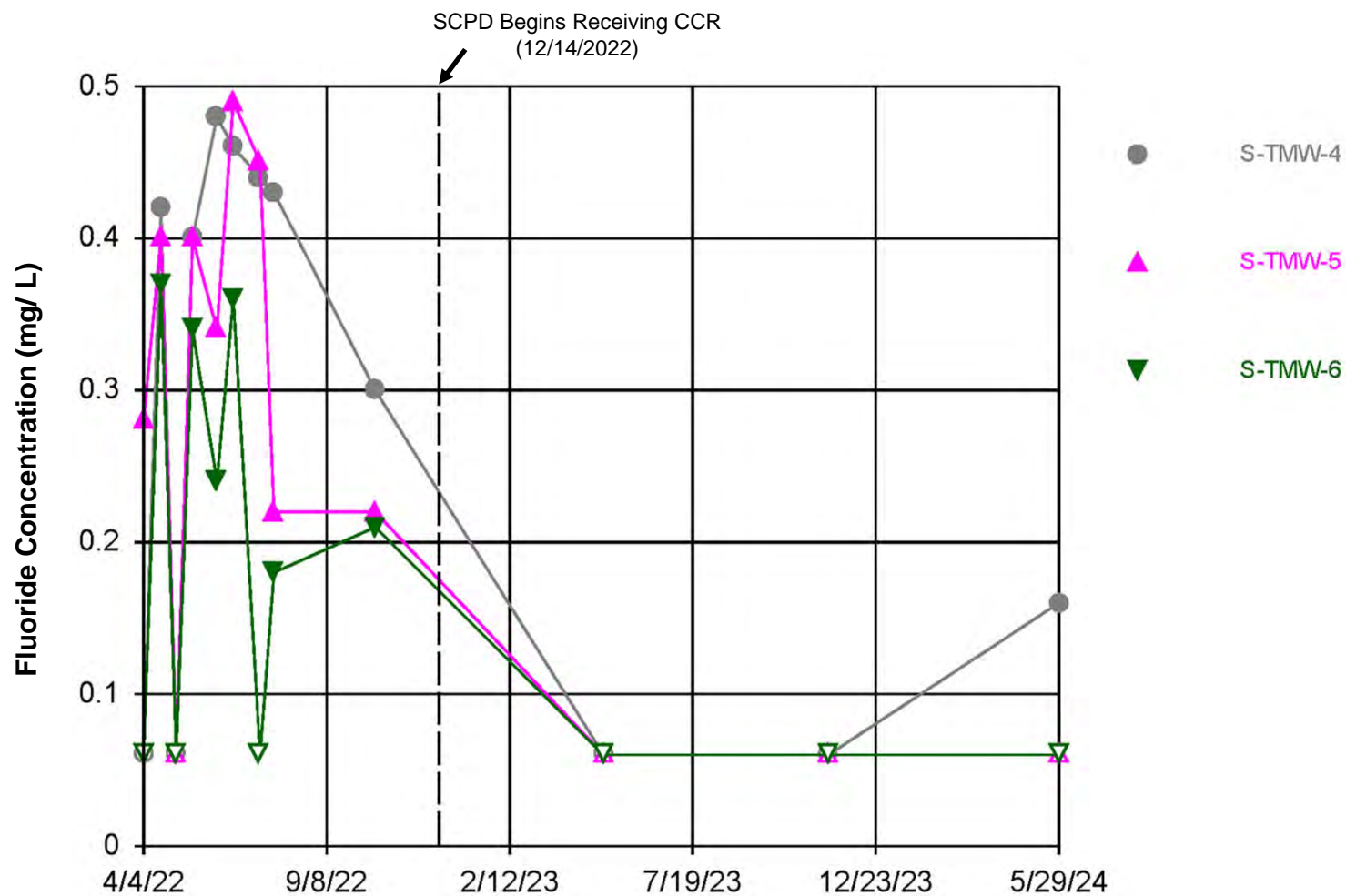


TITLE **Timeseries Plot of Boron Concentrations at
Downgradient SCPD Wells**

Rev No.
NA

JOB NO.
23009-24

FIGURE **2**



Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT
AMEREN MISSOURI
SIOUX ENERGY CENTER



DRAWN
JSI

CHECKED
GTM

REVIEWED
MNH

DATE
2024-12-30

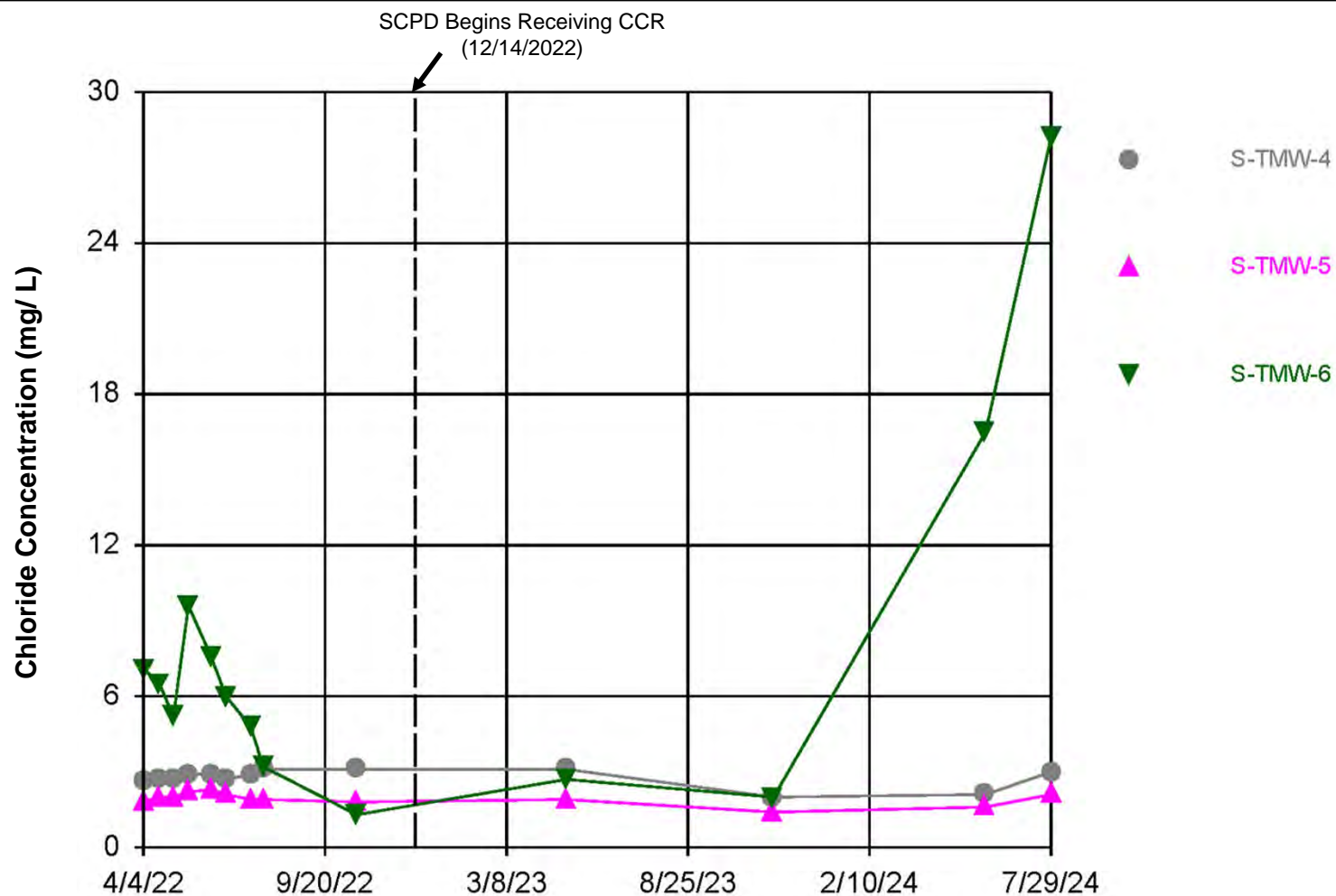


TITLE **Timeseries Plot of Fluoride Concentrations
at Downgradient SCPD Wells**

Rev No.
NA

JOB NO.
23009-24

FIGURE **3**



Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT
**AMEREN MISSOURI
SIOUX ENERGY CENTER**



DRAWN
JSI

CHECKED
GTM

REVIEWED
MNH

DATE
2024-12-30

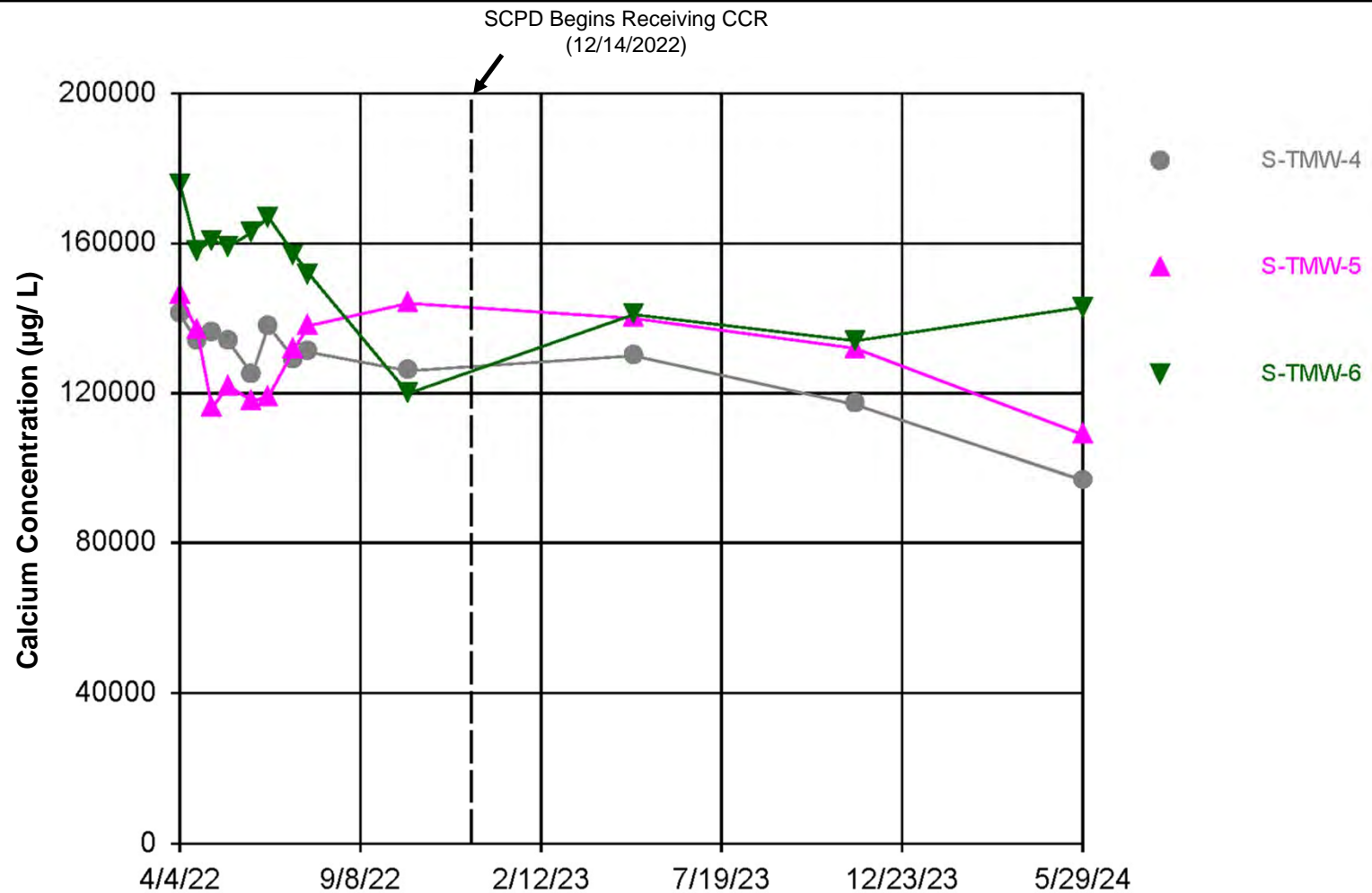


TITLE **Timeseries Plot of Chloride Concentrations
at Downgradient SCPD Wells**

Rev No.
NA

JOB NO.
23009-24

FIGURE **4**



Notes

- 1) µg/L – Micrograms per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.

CLIENT/PROJECT
**AMEREN MISSOURI
SIOUX ENERGY CENTER**



TITLE **Timeseries Plot of Calcium Concentrations
at Downgradient SCPD Wells**

DRAWN
JSI

CHECKED
GTM

REVIEWED
MNH

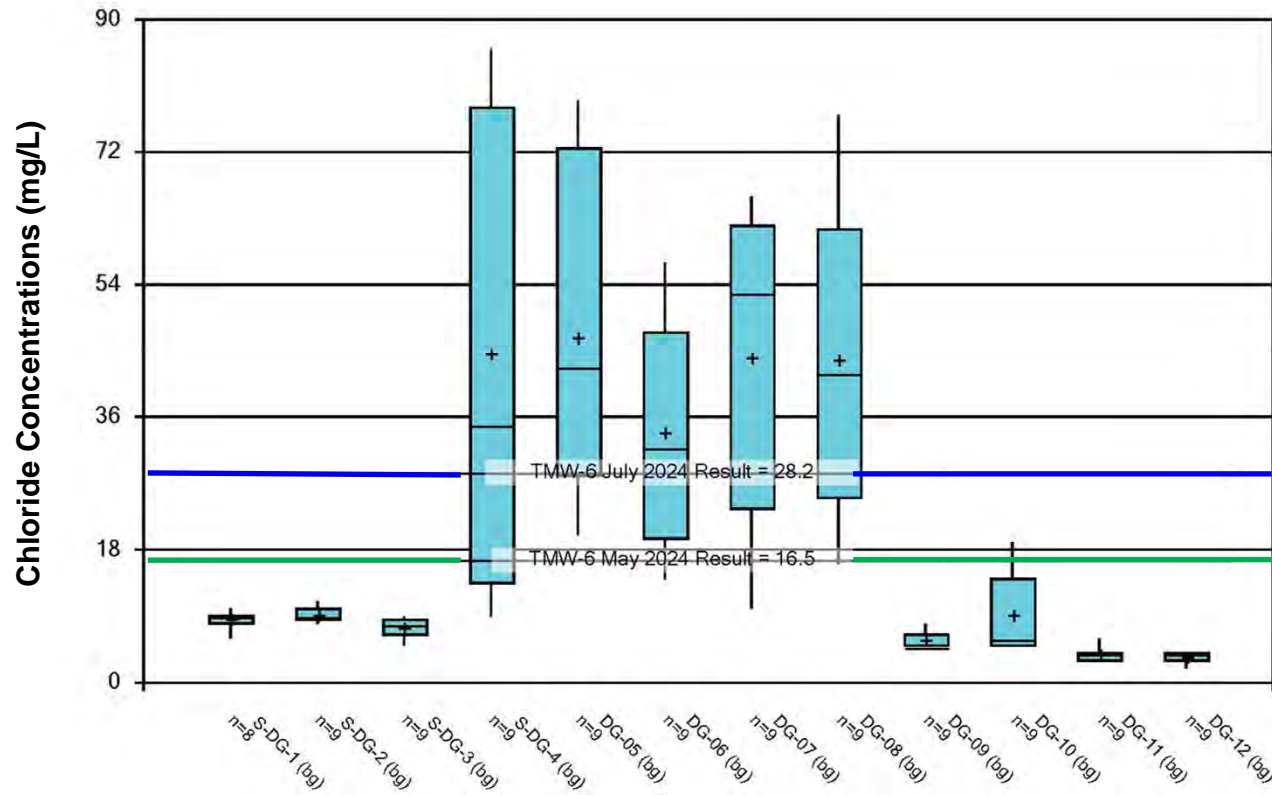
DATE
2024-12-30

Rev No.
NA

JOB NO.
23009-24

FIGURE **6**

Box & Whiskers Plot



TMW-6 July 2024 Chloride Result (28.2 J mg/L)

TMW-6 May 2024 Chloride Result (16.5 mg/L)

Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.
- 4) UWL – Utility Waste Landfill
- 5) J – Result is an estimated value.

CLIENT/PROJECT
AMEREN MISSOURI
SIOUX ENERGY CENTER



DRAWN
GTM

CHECKED
JSI

REVIEWED
MNH

DATE
2024-12-31



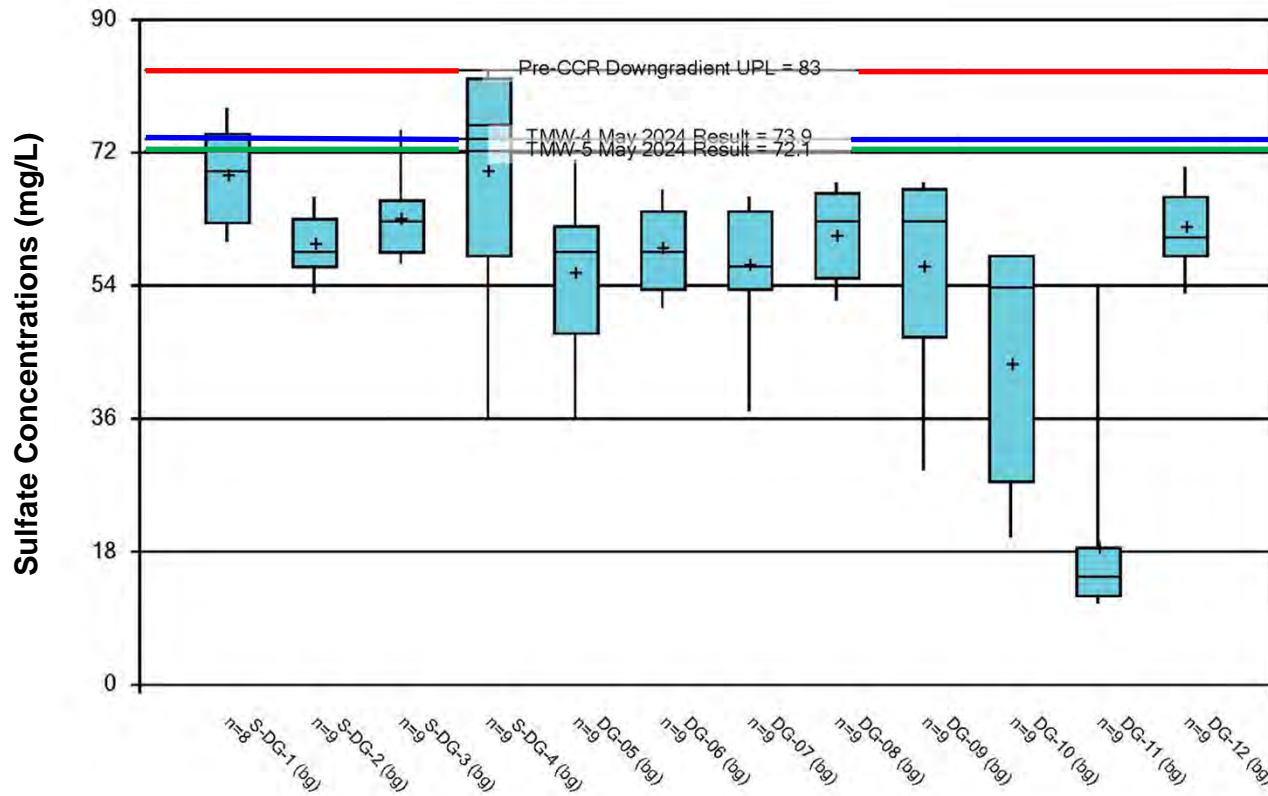
TITLE
Pre-CCR Placement Chloride Concentrations –
State UWL Downgradient Monitoring Wells

Rev No.
NA

JOB NO.
23009-24

FIGURE
7

Box & Whiskers Plot



**Pre-CCR Downgradient
UPL (83.0 mg/L)**

**TMW-4 May 2024 Sulfate
Result (73.9 mg/L)**

**TMW-5 May 2024 Sulfate
Result (72.1 mg/L)**

Notes

- 1) mg/L – Milligrams per liter.
- 2) UPL – Upper Prediction Limit.
- 3) CCR – Coal Combustion Residuals.
- 4) UWL – Utility Waste Landfill
- 5) J – Result is an estimated value.

CLIENT/PROJECT
**AMEREN MISSOURI
SIOUX ENERGY CENTER**



DRAWN
GTM

CHECKED
JSI

REVIEWED
MNH

DATE
2024-12-31



TITLE **Pre-CCR Placement Sulfate Concentrations –
State UWL Downgradient Monitoring Wells**

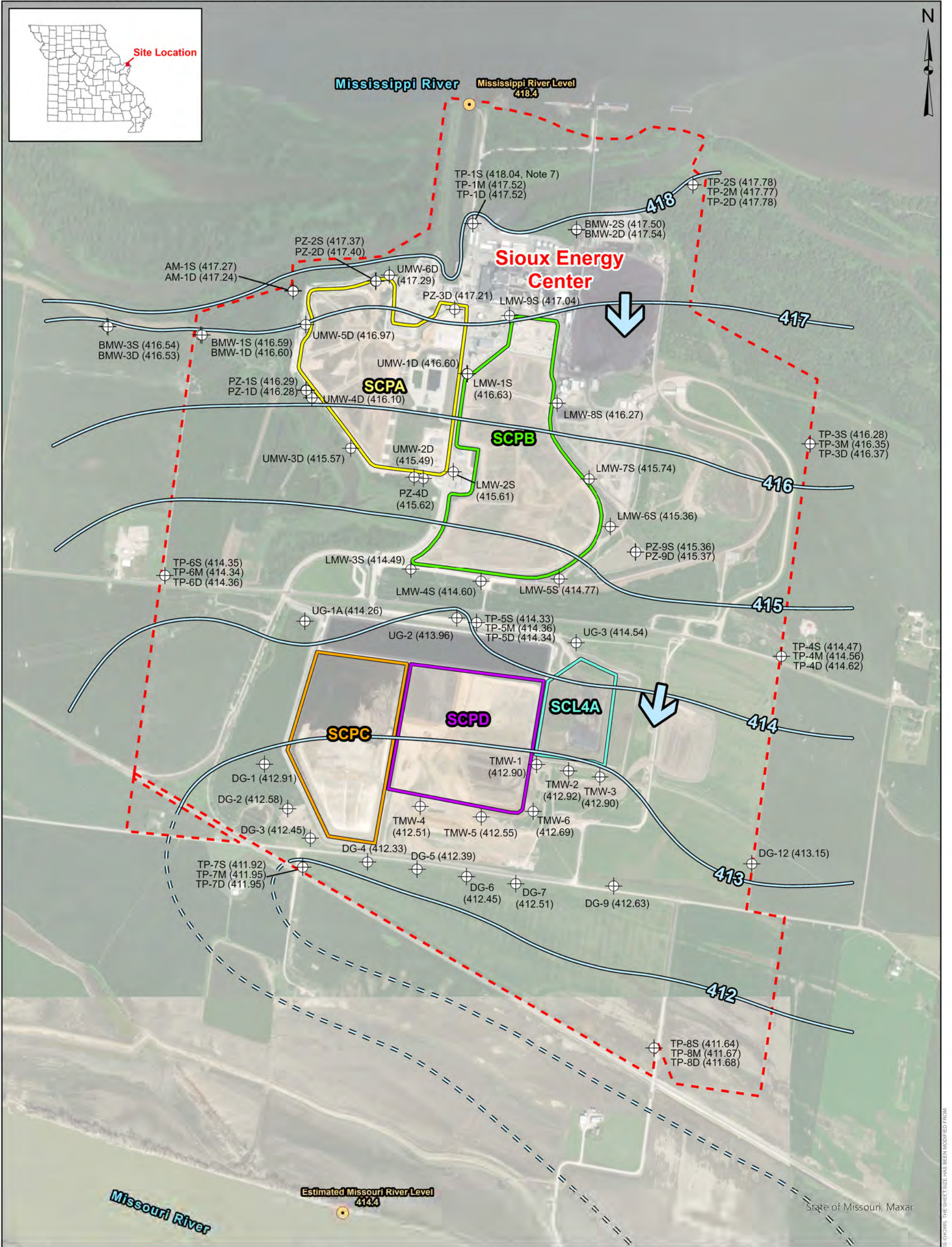
Rev No.
NA

JOB NO.
23009-24

FIGURE **8**

Appendix D

2024 Potentiometric Surface Maps



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)

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).

TITLE

FEBRUARY 6, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT

CCR GROUNDWATER MONITORING PROGRAM

CLIENT

AMEREN MISSOURI SIOUX ENERGY CENTER

DESIGN

GTM

YYYY-MM-DD

2024-07-03

PREPARED

JTA

PROJECT No.

23009-24

REVIEW

GTM

APPROVED

MNH

Rocksmith Geoeengineering

FIGURE D1

0

500

1,000

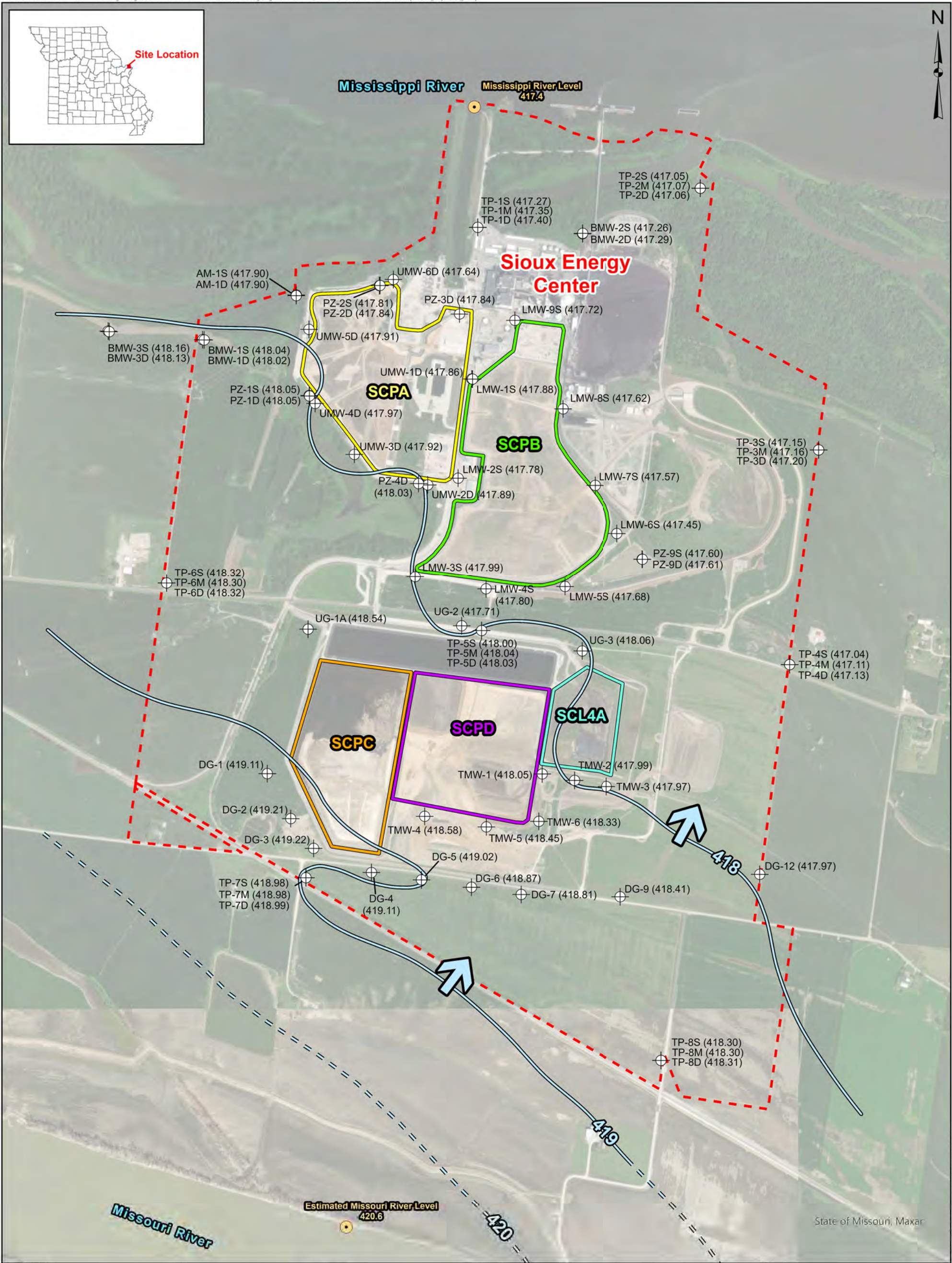
1,500

2,000

Feet

State of Missouri, Maxar

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11x17



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

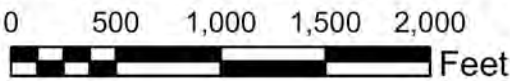
- River Gauge Location
- Monitoring Well or Piezometer
- Groundwater Flow Direction

NOTES

- ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
- MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- FGD - FLUE GAS DESULFURIZATION.

REFERENCES

- AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
- COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
- USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).



TITLE

MAY 24, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT

CCR GROUNDWATER MONITORING PROGRAM

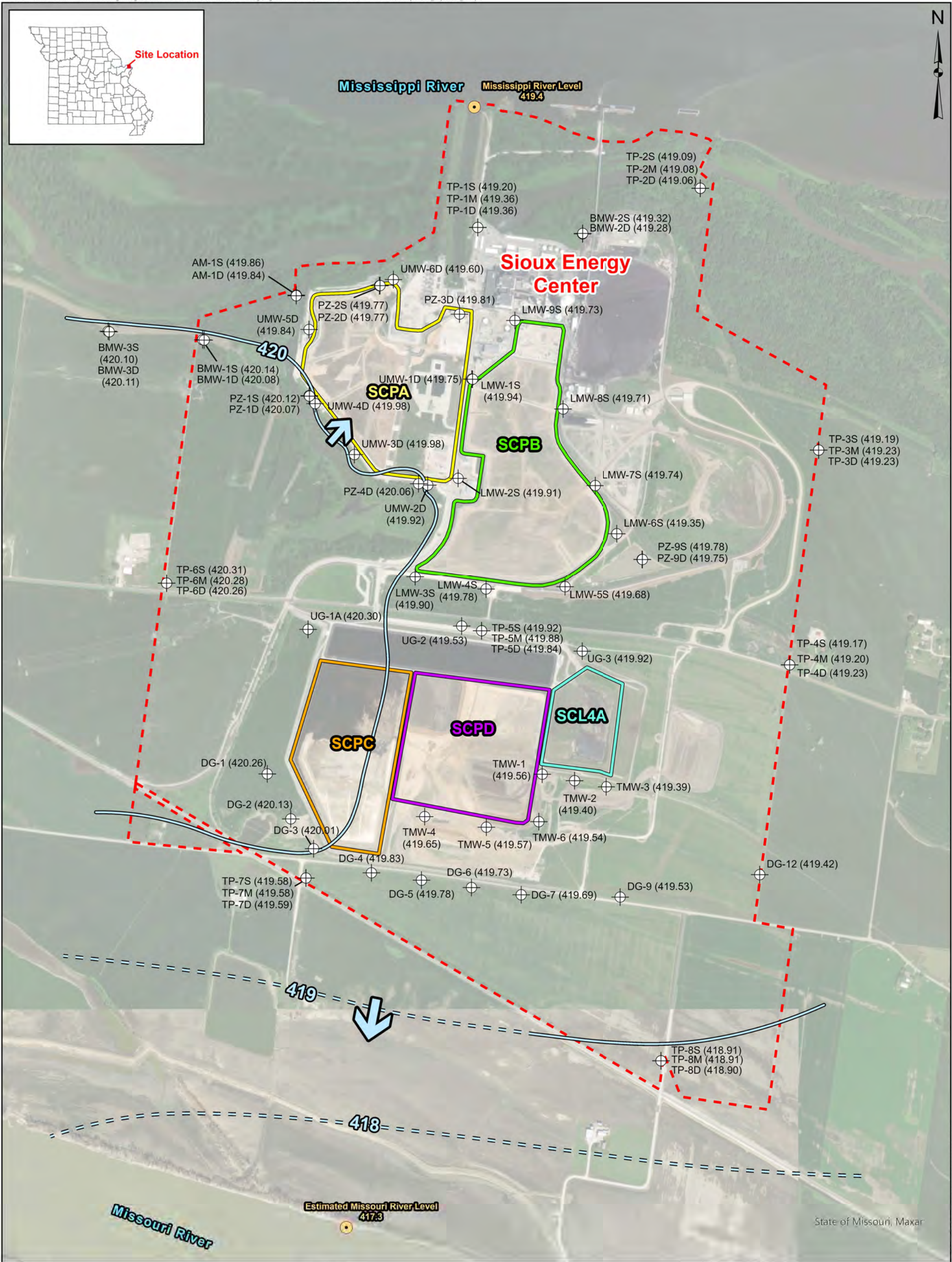
CLIENT

AMEREN MISSOURI
SIOUX ENERGY CENTER



DESIGN	GTM	YYYY-MM-DD	2024-07-03
PREPARED	JTA	PROJECT No.	23009-24
REVIEW	GTM	FIGURE D2	
APPROVED	MNH		





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

- ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
- MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- FGD - FLUE GAS DESULFURIZATION.

REFERENCES

- AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
- COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.
- 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

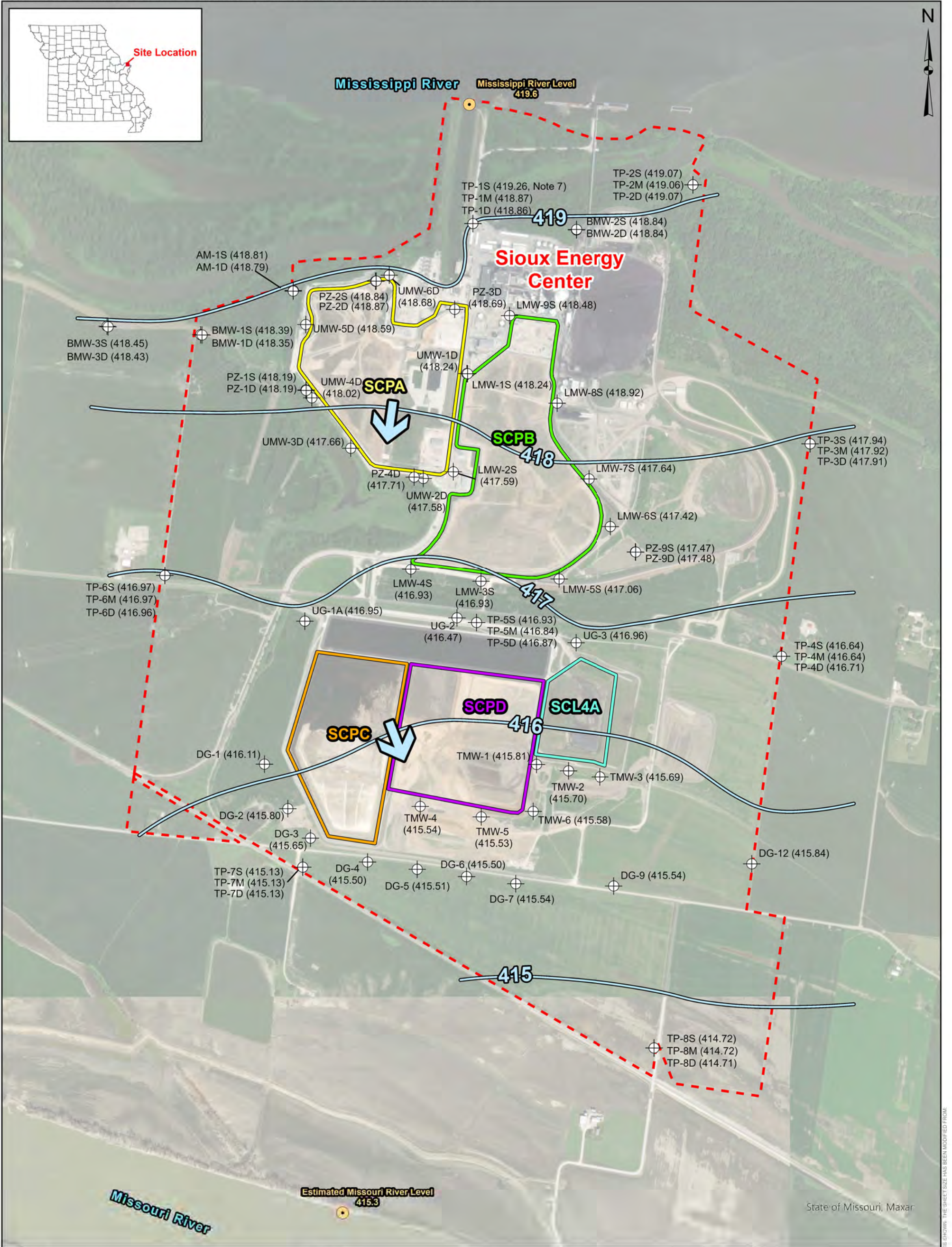
CLIENT

AMEREN MISSOURI
SIOUX ENERGY CENTER



DESIGN	GTM	YYYY-MM-DD	2024-09-11
PREPARED	JTR	PROJECT No.	23009-24
REVIEW	GTM	FIGURE D3	
APPROVED	MNH		





LEGEND

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).

TITLE

NOVEMBER 14, 2024 POTENTIOMETRIC SURFACE MAP

PROJECT

CCR GROUNDWATER MONITORING PROGRAM

CLIENT

AMEREN MISSOURI
SIOUX ENERGY CENTER

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 11x17