REPORT

# 2023 Annual Groundwater Monitoring and Corrective Action Report

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

**January 31, 2024**

**Project Number: 23009**

## Submitted to:

Ameren Missouri
1901 Chouteau Avenue
St. Louis, Missouri 63103

## Submitted by:

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

# EXECUTIVE SUMMARY AND STATUS OF THE SCPC GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule" (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§ 257.90(e)). Ameren Missouri (Ameren) has determined that the Utility Waste Landfill (UWL) SCPC Surface Impoundment (or Cell 1) at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This Annual Report for the SCPC describes CCR Rule groundwater monitoring activities from January 1, 2023 through December 31, 2023 including verification results related to late 2022 sampling.

Throughout 2023, the SCPC CCR unit has been operating under the Detection Monitoring Program (§257.94), which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. SSIs were determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

**Table 1 - Summary of 2023 SCPC Sampling Events, Previous Year Verification, and Statistical Evaluations**

| Event Name | Type of Event and Sampling Dates | Laboratory Analytical Data Receipt | Parameters Collected | Verified SSIs | SSI Determination Date | ASD Completion Date |
|---|---|---|---|---|---|---|
| October 2022 Sampling Event | Detection Monitoring, October 18-21, 2022 | November 22, 2022 | Appendix III, Major Cations and Anions | **TDS:** DG-3 | February 20, 2023 | May 19, 2023 |
| | Verification Sampling, January 3-4, 2023 | January 18, 2023 | Detected Appendix III parameters (See Note 1) | | | |
| May 2023 Sampling Event | Detection Monitoring, May 2-3, 2023 | June 21, 2023 | Appendix III, Major Cations and Anions | **Boron:** UG-2<br>**Sulfate:** DG-3<br>**TDS:** DG-3 | September 19, 2023 | December 18, 2023 |
| | Verification Sampling, July 11 & August 1, 2023 | July 25 & August 15, 2023 | Detected Appendix III parameters | | | |
| November 2023 Sampling Event | Detection Monitoring, November 10-13, 2023 | December 27, 2023 | Appendix III, Major Cations and Anions | To be determined after statistical analysis and Verification Sampling are completed in 2024. | | |

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

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

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

There were no changes made to the monitoring system in 2023 with no new wells being installed or decommissioned.

CCR placement within the SCPC has ceased as of December 14, 2022 and CCR was routed to the newly constructed cell east of the SCPC called the SCPD. More information on the SCPD Cell is provided in the SCPD Annual Report. Additionally, as required by the CCR Rule (§ 257.102(e)(1)), closure design has been initiated for the SCPC.

# Table of Contents



## TABLES



## FIGURES



## APPENDICES

# 1.0 INSTALLATION OR DECOMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCPC. The groundwater monitoring system consists of 8 groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1** and is listed on **Table 2**, below. No new monitoring wells were installed or decommissioned in 2023 as a part of the CCR Rule monitoring program for the SCPC. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the SCPC.

# 2.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the SCPC CCR Unit in 2023. **Table 2** below provides a summary of the groundwater samples collected in 2023 including the number of samples, the date of sample collection, and the monitoring program for which the samples were collected.

**Table 2 – Summary of Groundwater Sampling Dates**

| Sampling Event | Groundwater Monitoring Wells | | | | | | | | Monitoring Program |
|---|---|---|---|---|---|---|---|---|---|
| | BMW-1S | BMW-3S | UG-1A | UG-2 | DG-1 | DG-2 | DG-3 | DG-4 | |
| | Date of Sample Collection | | | | | | | | |
| January 2023 Verification Sampling | - | - | 1/4/2023 | - | - | 1/3/2023 | 1/3/2023 | - | Detection |
| May 2023 Sampling Event | 5/2/2023 | 5/2/2023 | 5/3/2023 | 5/3/2023 | 5/3/2023 | 5/3/2023 | 5/3/2023 | 5/3/2023 | Detection |
| July 2023 Verification Sampling | - | - | - | 7/11/2023 | - | - | 7/11/2023* | - | Detection |
| November 2023 Sampling Event | 11/10/2023 | 11/10/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | Detection |
| Total Number of Samples Collected | 2 | 2 | 3 | 3 | 2 | 3 | 4 | 2 | NA |

Notes:
1) Detection Monitoring events tested for Appendix III Parameters.
2) Only analytes/wells that were detected above the prediction limit were tested during verification sampling.
3) "-" No sample collected.
4) NA – Not applicable.
5) *Total Dissolved Solids sampled at DG-3 was collected on August 1, 2023.

## 2.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed October 18-21, 2022. Verification sampling and the statistical analyses to evaluate for SSIs for the October 2022 event were not completed until 2023 and are included in this report. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed January 3-4, 2023 and verified one SSI. **Table 3** summarizes

the results and statistical analysis of the October 2022 Detection Monitoring event. Laboratory analytical data from the January 2023 verification sampling event through the November 2023 sampling event are provided in **Appendix A**. Laboratory analytical data for the October 2022 Detection Monitoring event are provided in the 2022 Groundwater Monitoring and Corrective Action Annual Report for the SCPC.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An ASD was completed for this SSI and is provided in **Appendix B**. This ASD demonstrates that the SSI at monitoring well DG-3 is not caused by the SCPC CCR Unit, and therefore, the SCPC CCR Unit remains in Detection Monitoring.

Detection Monitoring samples were collected May 2-3, 2023, and testing was completed for all Appendix III analytes, as well as major cations and anions. Detections above respective prediction limits for some Appendix III analytes triggered a verification sampling event, which was completed on July 11 as well as August 1, 2023 and verified SSIs. **Table 4** summarizes the results and statistical analyses of the May 2023 Detection Monitoring event. Laboratory analytical data from this sampling event is included in **Appendix A**. Similar to previous results, SSIs in the monitoring well network are not caused by the SCPC CCR unit, as demonstrated by the ASD provided in **Appendix C**.

A Detection Monitoring sampling event was completed November 10-13, 2023 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 2023 data were not completed in 2023 and the results will be provided in the 2024 Annual Report. **Table 5** summarizes the results of the November 2023 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

## 2.2 Groundwater Elevation, Flow Rate and Direction

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

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

Groundwater flow direction and hydraulic gradient at the SEC were estimated for the alluvial aquifer wells using commercially available software to evaluate data since 2016. Results indicate that groundwater flow direction at the SEC is variable due to fluctuating river levels but has most often flowed from north to south. The overall net groundwater flow direction in the alluvial aquifer at the SEC was south-southeast in 2023 as a result of river levels in the Missouri and Mississippi Rivers. From 2016 through 2022, horizontal gradients have ranged from 0.00006 to 0.001 feet/foot with an estimated net annual groundwater movement of approximately four feet per year in the prevailing downgradient direction. Since July 2022, due to low Missouri River levels, there has been a more prevalent southward flow direction at a rate of approximately 35 feet per year.

## 2.3 Sampling Issues

After the May 2023 Detection Monitoring event, wells UG-2 and DG-3 were sampled on July 11, 2023 to verify boron and sulfate SSIs. Following receipt of this data, it was determined that the TDS value at well DG-3 collected on May 3, 2023 was in exceedance of the prediction limit and required a verification sample. The initial sample bottle collected on July 11 was outside of USEPA method holding time for TDS analysis, so an additional verification sample at DG-3 was collected on August 1, 2023.

No other notable sampling issues were encountered at the SCPC in 2023.

# 3.0 ACTIVITIES PLANNED FOR 2024

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2024. Statistical analysis of the November 2023 Detection Monitoring data will be completed in 2024 and will be included in the 2024 Annual Report.

# Tables

# Table 3
# October 2022 Detection Monitoring Results
# SCPC Surface Impoundment
# Sioux Energy Center, St. Charles County, MO

| | | BACKGROUND | | GROUNDWATER MONITORING WELLS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | UNITS | BMW-1S | BMW-3S | Prediction Limit UG-1A | UG-1A | Prediction Limit UG-2 | UG-2 | Prediction Limit DG-1 | DG-1 | Prediction Limit DG-2 | DG-2 | Prediction Limit DG-3 | DG-3 | Prediction Limit DG-4 | DG-4 |
| October 2022 Detection Monitoring Event | | | | | | | | | | | | | | | |
| DATE | NA | 10/18/2022 | 10/18/2022 | NA | 10/21/2022 | NA | 10/21/2022 | NA | 10/20/2022 | NA | 10/21/2022 | NA | 10/21/2022 | NA | 10/21/2022 |
| pH | SU | 6.84 | 7.01 | 6.423-7.284 | 6.26 | 6.29-7.36 | 7.00 | 6.653-7.324 | 6.95 | 6.681-7.341 | 6.93 | 6.64-7.251 | 6.89 | 6.617-7.24 | 6.94 |
| BORON, TOTAL | µg/L | 73.0 J | 84.2 J | 462.2 | ND | 264.7 | 184 | 118.8 | ND | 114.3 | ND | 103.9 | ND | 114.5 | ND |
| CALCIUM, TOTAL | µg/L | 168,000 | 131,000 | 204,191 | 109,000 | 146,120 | 122,000 | 174,000 | 131,000 | 161,503 | 130,000 | 168,024 | 162,000 | 167,122 | 136,000 |
| CHLORIDE, TOTAL | mg/L | 9.2 | 11.7 | 147.5 | 6.4 | 98.49 | 59.2 | 10 | 3.4 | 10.72 | 2.8 | 17.71 | 3.3 | 111.7 | 54.0 |
| FLUORIDE, TOTAL | mg/L | 0.20 J | 0.22 | 0.4 | 0.47 | 0.3257 | ND | 0.3803 | ND | 0.4553 | ND | 0.4775 | ND | 0.4524 | ND |
| SULFATE, TOTAL | mg/L | 61.1 | 27.8 | 115.8 | 72.2 | 95.94 | 47.3 | 71.52 | 28.1 | 68.0 | 32.3 | 72.94 | 63.8 | 80.26 | 52.0 |
| TOTAL DISSOLVED SOLIDS | mg/L | 711 | 467 | 810.6 | 279 | 758 | 649 | 548.8 | 517 | 537.9 | 1,320 J | 592.9 | 622 | 808 | 636 |
| January 2023 Verification Sampling Event | | | | | | | | | | | | | | | |
| DATE | NA | | | | 1/4/2023 | | | | | | 1/3/2023 | | 1/3/2023 | | |
| pH | SU | | | | 7.04 | | | | | | | | | | |
| BORON, TOTAL | µg/L | | | | | | | | | | | | | | |
| CALCIUM, TOTAL | µg/L | | | | | | | | | | | | | | |
| CHLORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| FLUORIDE, TOTAL | mg/L | | | | ND | | | | | | | | | | |
| SULFATE, TOTAL | mg/L | | | | | | | | | | | | | | |
| TOTAL DISSOLVED SOLIDS | mg/L | | | | | | | | | | 474 | | 595 | | |

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. 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: JSI
Reviewed By: MNH

# Table 4
# May 2023 Detection Monitoring Results
# SCPC Surface Impoundment
# Sioux Energy Center, St. Charles County, MO

| | | BACKGROUND | | GROUNDWATER MONITORING WELLS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | UNITS | BMW-1S | BMW-3S | Prediction Limit UG-1A | UG-1A | Prediction Limit UG-2 | UG-2 | Prediction Limit DG-1 | DG-1 | Prediction Limit DG-2 | DG-2 | Prediction Limit DG-3 | DG-3 | Prediction Limit DG-4 | DG-4 |
| May 2023 Detection Monitoring Event | | | | | | | | | | | | | | | |
| DATE | NA | 5/2/2023 | 5/2/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 |
| pH | SU | 6.80 | 6.95 | 6.423-7.284 | 6.95 | 6.29-7.36 | 7.09 | 6.653-7.324 | 6.95 | 6.681-7.341 | 6.98 | 6.64-7.251 | 6.90 | 6.617-7.24 | 6.90 |
| BORON, TOTAL | µg/L | 64.8 J | 67.1 J | 462.2 | 89.9 J | 264.7 | 458 | 118.8 | 96.9 J | 114.3 | 75.5 J | 103.9 | 83.6 J | 114.5 | 91.4 J |
| CALCIUM, TOTAL | µg/L | 184,000 | 137,000 | 204,191 | 138,000 | 146,120 | 115,000 | 174,000 | 129,000 | 161,503 | 126,000 | 168,024 | 159,000 | 167,122 | 139,000 |
| CHLORIDE, TOTAL | mg/L | 13.1 | 12.6 | 147.5 | 79.9 | 98.49 | 37.2 | 10 | 3.6 | 10.72 | 2.8 | 17.71 | 6.9 | 111.7 | 25.4 |
| FLUORIDE, TOTAL | mg/L | ND | ND | 0.4 | ND | 0.3257 | ND | 0.3803 | ND | 0.4553 | ND | 0.4775 | ND | 0.4524 | ND |
| SULFATE, TOTAL | mg/L | 37.7 | 32.4 | 115.8 | 49.4 | 95.94 | 51.8 | 71.52 | 29.5 | 68 | 28.4 | 72.94 | 76.3 | 80.26 | 56.9 |
| TOTAL DISSOLVED SOLIDS | mg/L | 610 | 495 | 810.6 | 622 | 758 | 496 | 548.8 | 499 | 537.9 | 481 | 592.9 | 640 | 808 | 601 |
| July 2023 Verification Sampling Event | | | | | | | | | | | | | | | |
| DATE | NA | | | | | | 7/11/2023 | | | | | | 7/11/2023[8] | | |
| pH | SU | | | | | | | | | | | | | | |
| BORON, TOTAL | µg/L | | | | | | 291 | | | | | | | | |
| CALCIUM, TOTAL | µg/L | | | | | | | | | | | | | | |
| CHLORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| FLUORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| SULFATE, TOTAL | mg/L | | | | | | | | | | | | 75.8 | | |
| TOTAL DISSOLVED SOLIDS | mg/L | | | | | | | | | | | | 665 | | |

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. 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.
8. Total Dissolved Solids sample at DG-3 collected on 8/1/2023.

Prepared By: GTM
Checked By: JSI
Reviewed By: MNH

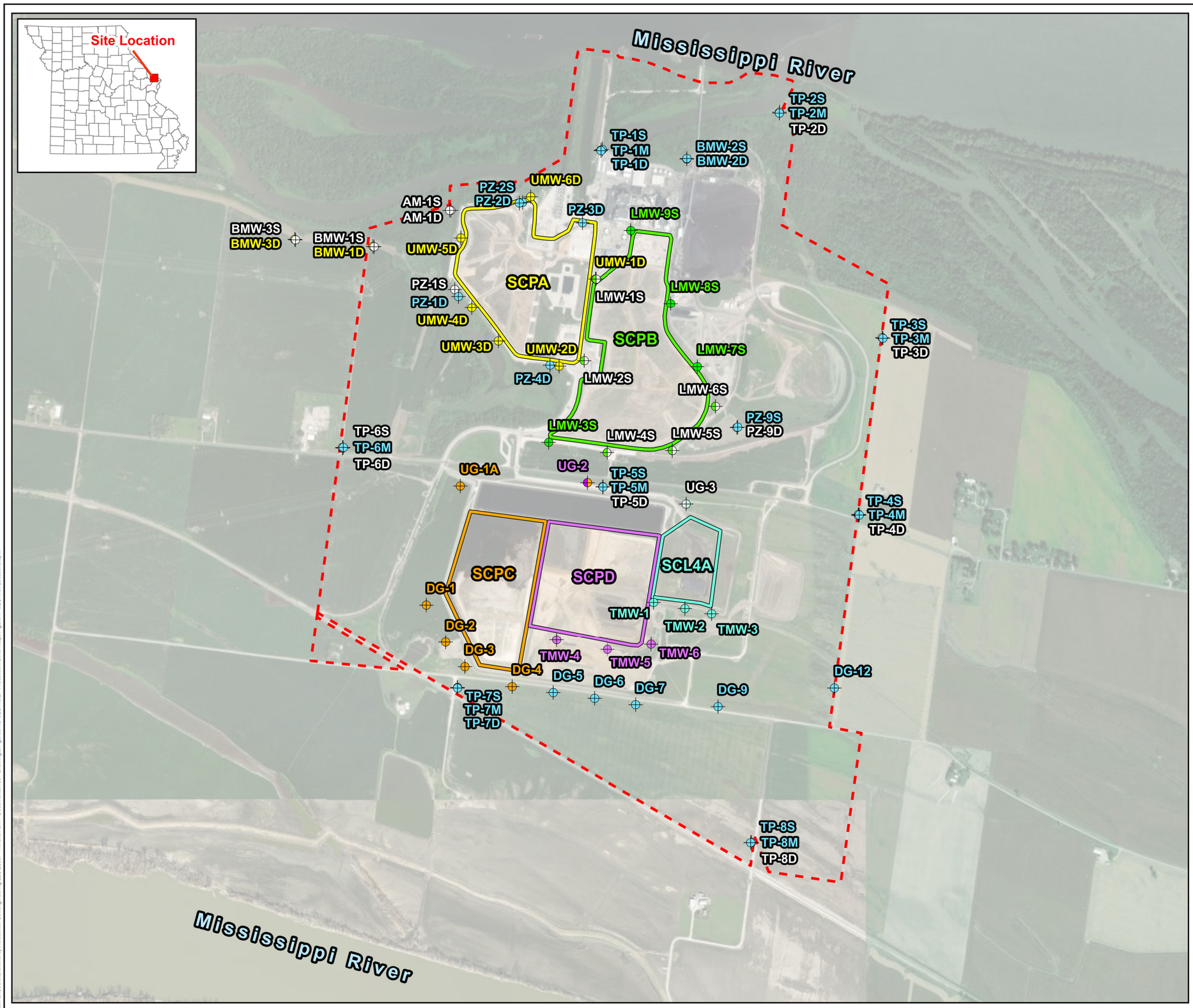
# Table 5
# November 2023 Detection Monitoring Results
# SCPC Surface Impoundment
# Sioux Energy Center, St. Charles County, MO

| | | BACKGROUND | | GROUNDWATER MONITORING WELLS | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | UNITS | BMW-1S | BMW-3S | UG-1A | UG-2 | DG-1 | DG-2 | DG-3 | DG-4 |
| November 2023 Detection Monitoring Event | | | | | | | | | |
| DATE | NA | 11/10/2023 | 11/10/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 | 11/13/2023 |
| pH | SU | 7.04 | 7.14 | 6.90 | 7.10 | 7.00 | 7.02 | 6.93 | 6.88 |
| BORON, TOTAL | µg/L | 57.9 J | 58.9 J | 165 | 1,700 | 107 | 82.0 J | 81.9 J | 105 |
| CALCIUM, TOTAL | µg/L | 136,000 | 114,000 | 157,000 | 119,000 | 138,000 | 133,000 J | 160,000 | 154,000 |
| CHLORIDE, TOTAL | mg/L | 7.2 | 13.4 | 74.8 J | 12.9 J | 2.5 J | 2.3 J | 8.2 J | 12.4 J |
| FLUORIDE, TOTAL | mg/L | ND | ND | ND | ND | ND | ND | ND | ND |
| SULFATE, TOTAL | mg/L | 46.9 | 12.3 | 52.7 J | 0.79 J | 19.4 J | 35.2 J | 65.1 J | 63.3 J |
| TOTAL DISSOLVED SOLIDS | mg/L | 475 | 398 | 672 | 483 | 549 | 505 | 594 | 732 |

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: GTM
Checked By: JSI
Reviewed By: MNH

# Figures




TITLE

# SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

**Legend**

- Sioux Energy Center Property Boundary

**CCR Units**

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

**Utility Waste Landfill Cells**

- SCL4A - Dry CCR Disposal Area
- SCPC - Inactive FGD Surface Impoundment (Closure in Progress)
- SCPD - FGD Surface Impoundment

**Monitoring Well Networks**

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

**NOTES**

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

**REFERENCES**

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

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

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

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

**FIGURE 1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in

Path: C:\Users\GrantMoney\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings_Figures\4.3-SEC\4.3.2 - Production\Other Maps\Figure 1- SEC Well Locations.aprx

# Appendix A
## Laboratory Analytical Data

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

January 18, 2023

Jeffrey Ingram
WSP Golder
701 Emerson Road
Suite 250
Saint Louis, MO 63141

RE: Project: AMEREN SEC SCPC
Pace Project No.: 60419220

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on January 05, 2023. 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: Mark Haddock, Golder Associates
Lisa Meyer, Ameren
Grant Morey, WSP Golder
Ann Muehlfarth, WSP Golder
Eric Schneider, WSP Golder

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

## CERTIFICATIONS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Pace Analytical Services Kansas**
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 22-031-0
Illinois Certification #: 2000302021-3
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 #: T104704407-21-15
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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

## SAMPLE SUMMARY

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60419220001** | **S-DG-2** | Water | 01/03/23 10:25 | 01/05/23 03:55 |
| **60419220002** | **S-DG-3** | Water | 01/03/23 10:42 | 01/05/23 03:55 |
| **60419220003** | **S-UG-1A** | Water | 01/04/23 11:27 | 01/05/23 03:55 |
| **60419220004** | **S-SCPC-FB-1** | Water | 01/03/23 10:47 | 01/05/23 03:55 |
| **60419220005** | **S-SCPC-DUP-1** | Water | 01/04/23 00:00 | 01/05/23 03:55 |

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

## SAMPLE ANALYTE COUNT

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60419220001** | **S-DG-2** | SM 2540C | TML | 1 | PASI-K |
| | | EPA 300.0 | RKA | 1 | PASI-K |
| **60419220002** | **S-DG-3** | SM 2540C | TML | 1 | PASI-K |
| | | EPA 300.0 | RKA | 1 | PASI-K |
| **60419220003** | **S-UG-1A** | SM 2540C | TML | 1 | PASI-K |
| | | EPA 300.0 | RKA | 1 | PASI-K |
| **60419220004** | **S-SCPC-FB-1** | SM 2540C | TML | 1 | PASI-K |
| | | EPA 300.0 | RKA | 1 | PASI-K |
| **60419220005** | **S-SCPC-DUP-1** | SM 2540C | TML | 1 | PASI-K |
| | | EPA 300.0 | RKA | 1 | PASI-K |

PASI-K = Pace Analytical Services - Kansas City

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

## ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Sample: S-DG-2** **Lab ID: 60419220001** Collected: 01/03/23 10:25 Received: 01/05/23 03:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **474** | mg/L | 10.0 | 10.0 | 1 | | 01/10/23 09:32 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 01/06/23 20:31 | 16984-48-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Sample: S-DG-3** **Lab ID: 60419220002** Collected: 01/03/23 10:42 Received: 01/05/23 03:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **595** | mg/L | 10.0 | 10.0 | 1 | | 01/10/23 09:32 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 01/06/23 21:51 | 16984-48-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Sample: S-UG-1A** **Lab ID: 60419220003** Collected: 01/04/23 11:27 Received: 01/05/23 03:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **419** | mg/L | 10.0 | 10.0 | 1 | | 01/11/23 10:08 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 01/06/23 22:04 | 16984-48-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Sample: S-SCPC-FB-1** **Lab ID: 60419220004** Collected: 01/03/23 10:47 Received: 01/05/23 03:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **<5.0** | mg/L | 5.0 | 5.0 | 1 | | 01/10/23 09:32 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 01/06/23 22:18 | 16984-48-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

**Sample: S-SCPC-DUP-1** **Lab ID: 60419220005** Collected: 01/04/23 00:00 Received: 01/05/23 03:55 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **430** | mg/L | 10.0 | 10.0 | 1 | | 01/11/23 10:08 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 01/06/23 22:31 | 16984-48-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

QC Batch: 826600 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60419220001, 60419220002, 60419220004

METHOD BLANK: 3283344 Matrix: Water
Associated Lab Samples: 60419220001, 60419220002, 60419220004

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 01/10/23 09:30 | |

LABORATORY CONTROL SAMPLE: 3283345

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 988 | 99 | 80-120 | |

SAMPLE DUPLICATE: 3283346

| Parameter | Units | 60419220001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 474 | 476 | 0 | 10 | |

SAMPLE DUPLICATE: 3283347

| Parameter | Units | 60419223002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 464 | 466 | 0 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

QC Batch: 826840
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60419220003, 60419220005

METHOD BLANK: 3284069 Matrix: Water
Associated Lab Samples: 60419220003, 60419220005

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 01/11/23 10:08 | |

LABORATORY CONTROL SAMPLE: 3284070

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 999 | 100 | 80-120 | |

SAMPLE DUPLICATE: 3284071

| Parameter | Units | 60419197001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1700 | 1750 | 3 | 10 | |

SAMPLE DUPLICATE: 3284072

| Parameter | Units | 60419233007 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 5580 | 5300 | 5 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

QC Batch: 826128 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: 60419220001, 60419220002, 60419220003, 60419220004, 60419220005

METHOD BLANK: 3281888 Matrix: Water
Associated Lab Samples: 60419220001, 60419220002, 60419220003, 60419220004, 60419220005

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 01/06/23 16:44 | |

METHOD BLANK: 3283714 Matrix: Water
Associated Lab Samples: 60419220001, 60419220002, 60419220003, 60419220004, 60419220005

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 01/09/23 19:45 | |

LABORATORY CONTROL SAMPLE: 3281889

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | 2.5 | 2.5 | 102 | 90-110 | |

LABORATORY CONTROL SAMPLE: 3283715

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | 2.5 | 2.4 | 97 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3281890 3281891

| Parameter | Units | 60419218006 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 1.9 | 1.9 | 76 | 74 | 80-120 | 2 | 15 | M1 |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3281893 3281894

| Parameter | Units | 60419220001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.5 | 2.5 | 97 | 100 | 80-120 | 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

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

## QUALITY CONTROL DATA

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3281896 3281897

| Parameter | Units | 60419222001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | mg/L | <1.2 | 25 | 25 | 28.0 | 28.3 | 112 | 113 | 80-120 | 1 | 15 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3281899 3281900

| Parameter | Units | 60419223002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.62 | 12.5 | 12.5 | 14.9 | 14.3 | 119 | 113 | 80-120 | 5 | 15 | |

SAMPLE DUPLICATE: 3281892

| Parameter | Units | 60419218006 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |

SAMPLE DUPLICATE: 3281895

| Parameter | Units | 60419220001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |

SAMPLE DUPLICATE: 3281898

| Parameter | Units | 60419222001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <1.2 | <1.2 | | 15 | |

SAMPLE DUPLICATE: 3281901

| Parameter | Units | 60419223002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.62 | <0.62 | | 15 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALIFIERS

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

## 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

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

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

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SEC SCPC
Pace Project No.: 60419220

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60419220001** | **S-DG-2** | SM 2540C | 826600 | | |
| **60419220002** | **S-DG-3** | SM 2540C | 826600 | | |
| **60419220003** | **S-UG-1A** | SM 2540C | 826840 | | |
| **60419220004** | **S-SCPC-FB-1** | SM 2540C | 826600 | | |
| **60419220005** | **S-SCPC-DUP-1** | SM 2540C | 826840 | | |
| **60419220001** | **S-DG-2** | EPA 300.0 | 826128 | | |
| **60419220002** | **S-DG-3** | EPA 300.0 | 826128 | | |
| **60419220003** | **S-UG-1A** | EPA 300.0 | 826128 | | |
| **60419220004** | **S-SCPC-FB-1** | EPA 300.0 | 826128 | | |
| **60419220005** | **S-SCPC-DUP-1** | EPA 300.0 | 826128 | | |

WO# : 60419220

60419220

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

Client Name: Golder Associates

**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:** T296 **Type of Ice:** (Wet) Blue None

**Cooler Temperature (°C):** **As-read** 1.5 **Corr. Factor** -0.1 **Corrected** 1.4

**Date and initials of person examining contents:** PV 1/5/22

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical
www.pacelabs.com

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Golder Associates USA Inc. | Report To: | Jeffrey Ingram | Attention: | |
| Address: | 701 Emerson Rd, Ste 250 | Copy To: | Eric Schnieder, Grant Morey | Company Name: | Golder Associates USA, Inc. |
| | Creve Coeur, MO 63141 | | | Address: | |
| Email To: | jeffrey_ingram@golder.com | Purchase Order No.: | | Pace Quote Reference: | |
| Phone: | 636-724-9191 Fax: 636-724-9323 | Project Name: | Ameren – SCPC | Pace Project Manager: | Jamie Church |
| Requested Due Date/TAT: | Standard | Project Number: | GL153140604 | Pace Profile #: | 9285 |

**REGULATORY AGENCY**

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

Site Location STATE: MO

**Section D** Required Client Information

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

**Valid Matrix Codes**

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

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COMPOSITE START TIME | COMPOSITE END/GRAB DATE | COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | Calcium | Chloride | Fluoride | Sulfate | TDS | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | Y/N | N | N | N | N | N | | 60419220 |
| 1 | S-DB-2 | WT | G | | | 1/3/23 | 1025 | | 1 | X | | | | | | | | | | | X | | X | | 3BP2U |
| 2 | S-DB-3 | WT | G | | | 1 | 1042 | | 1 | X | | | | | | | | | | | X | | X | | BP2U |
| 3 | S-DB-1A | WT | G | | | 1/4/23 | 1127 | | 1 | X | | | | | | | | | | | X | | X | | |
| 4 | S-SCPC-FB-1 | WT | G | | | 1/3/23 | 1047 | | 1 | X | | | | | | | | | | | X | | X | | |
| 5 | S-SCPC-DUP-1 | WT | G | | | 1/4/23 | X6 | | 1 | X | | | | | | | | | | | X | | X | | |
| 6 | S-SCPC-MS-1 | WT | G | | | 1/3/23 | 1025 | | 1 | X | | | | | | | | | | | X | | X | | |
| 7 | S-SCPC-MSD-1 | WT | G | | | 1 | 1025 | | 1 | X | | | | | | | | | | | X | | X | | MS/MSD collected |
| 8 | ~~S-UG-TA~~ | ~~WT~~ | ~~G~~ | | | ~~1/4/23~~ | ~~1127~~ | | ~~1~~ | ~~X~~ | | | | | | | | | | | ~~X~~ | | | | DB-2 |
| 9 | ~~S-SCPC-DUP-2~~ | ~~WT~~ | ~~G~~ | | | ~~1/3/23~~ | ~~=~~ | | ~~1~~ | ~~X~~ | | | | | | | | | | | ~~X~~ | | ~~X~~ | | |
| 10 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS: Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Jared Brown | 1/4/23 | 1230 | Jeff Clark | 1/4/23 | 1230 | | | | |
| | Jeff Clark | 1/4/23 | 1235 | [illegible] PASS | 1/5/23 | 0355 | 1.4 | Y | Y | Y |
| | | | | | | | | | | |
| | | | | | | | | | | |

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jared Brown

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 1/4/23

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

# MEMORANDUM

**DATE** January 18, 2023 **Project No.** 153140604.0003

**TO** Project File
WSP USA Inc.

**CC** Amanda Derhake, Jeff Ingram

**FROM** Rahel Pommerenke **EMAIL rahel.pommerenke@wsp.com**

**DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPC – VERIFICATION SAMPLING - DATA PACKAGE 60419220**

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

- None.

**WSP USA Inc.**
701 Emerson Road, Suite 250,
Creve Coeur, Missouri, USA 63141

T: +1 314 984-8800 F: +1 314 984-8770

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: WSP USA Inc.
Project Manager: J. Ingram
Project Name: Ameren SEC - SCPC VS
Project Number: 153140604.0003
Reviewer: R.Pommerenke
Validation Date: 1/18/2023

Laboratory: Pace Analytical Services
SDG #: 60419220
Analytical Method (type and no.): SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-DG-2, S-DG-3, S-UG-1A, S-SCPC-FB-1, S-SCPC-DUP-1

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

| Field Information | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Sampling dates noted? | x | | | 1/3/2023 - 1/4/2023 |
| b) Sampling team indicated? | x | | | JAB/PCS |
| c) Sample location noted? | x | | | |
| d) Sample depth indicated (Soils)? | | | x | |
| e) Sample type indicated (grab/composite)? | x | | | Grab |
| f) Field QC noted? | x | | | See notes. |
| g) Field parameters collected (note types)? | x | | | pH, Sp.Cond, ORP, Temp, DO, Turb |
| h) Field Calibration within control limits? | x | | | |
| i) Notations of unacceptable field conditions/performances from field logs or field notes? | | x | | |
| j) Does the laboratory narrative indicate deficiencies? | | | x | |

Note Deficiencies:

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

| Duplicates | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Were field duplicates collected (note original and duplicate sample names)? | ☒ | ☐ | ☐ | S-SCPC-DUP-1 @ S-UG-1A |
| b) Were field dup. precision criteria met (note RPD)? | ☒ | ☐ | ☐ | Max RPD (2.6%) < 20% |
| c) Were lab duplicates analyzed (note original and duplicate samples)? | ☒ | ☐ | ☐ | |
| d) Were lab dup. precision criteria met (note RPD)? | ☒ | ☐ | ☐ | Max RPD (5%) < 15% |

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

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

**Comments/Notes:**

MS/MSD:

3281890/3281891: MS/MSD % recovery low for Fluoride. Performed on unrelated sample: no qualification necessary.

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

| Sample Name | Constituent(s) | Result | Qualifier | Reason |
|---|---|---|---|---|
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Signature: _____ Date: 1/18/2023

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

June 21, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
5233 Roanoke Drive
Saint Charles, MO 63304

RE: Project: AMEREN SCPC
Pace Project No.: 60428021

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between May 03, 2023 and May 05, 2023. 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.
Grant Morey, Rocksmith Geoengineering, LLC.

**Pace Analytical Services, LLC**
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## CERTIFICATIONS

Project: AMEREN SCPC
Pace Project No.: 60428021

**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 #: T104704407-22-16
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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(913)599-5665

## SAMPLE SUMMARY

Project: AMEREN SCPC
Pace Project No.: 60428021

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60428021001** | **S-UG-1A** | Water | 05/03/23 13:53 | 05/05/23 05:10 |
| **60428021002** | **S-UG-2** | Water | 05/03/23 14:58 | 05/05/23 05:10 |
| **60428021003** | **S-DG-1** | Water | 05/03/23 11:14 | 05/05/23 05:10 |
| **60428021004** | **S-DG-2** | Water | 05/03/23 10:16 | 05/05/23 05:10 |
| **60428021005** | **S-DG-3** | Water | 05/03/23 09:20 | 05/05/23 05:10 |
| **60428021006** | **S-DG-4** | Water | 05/03/23 12:26 | 05/05/23 05:10 |
| **60428021007** | **S-SCPC-DUP-1** | Water | 05/03/23 08:00 | 05/05/23 05:10 |
| **60428021008** | **S-SCPC-FB-1** | Water | 05/03/23 12:36 | 05/05/23 05:10 |
| **60427703001** | **S-BMW-1S** | Water | 05/02/23 09:51 | 05/03/23 05:05 |
| **60427703002** | **S-BMW-3S** | Water | 05/02/23 11:32 | 05/03/23 05:05 |

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60428021

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60428021001** | **S-UG-1A** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021002** | **S-UG-2** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021003** | **S-DG-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021004** | **S-DG-2** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021005** | **S-DG-3** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021006** | **S-DG-4** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021007** | **S-SCPC-DUP-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60428021008** | **S-SCPC-FB-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | MLD | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60427703001** | **S-BMW-1S** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | CRN2 | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |
| **60427703002** | **S-BMW-3S** | EPA 200.7 | JXD | 7 | PASI-K |

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## SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60428021

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| | | SM 2320B | JS2 | 1 | PASI-K |
| | | SM 2540C | CRN2 | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 3 | PASI-K |

PASI-K = Pace Analytical Services - Kansas City

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-UG-1A** **Lab ID: 60428021001** Collected: 05/03/23 13:53 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **89.9J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7440-42-8 | |
| Calcium | **138000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7439-89-6 | |
| Magnesium | **32300** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7439-95-4 | |
| Manganese | **292** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7439-96-5 | |
| Potassium | **9060** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7440-09-7 | |
| Sodium | **22100** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:14 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **406** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:02 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **622** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:23 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **79.9** | mg/L | 10.0 | 5.3 | 10 | | 05/12/23 08:30 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 08:17 | 16984-48-8 | |
| Sulfate | **49.4** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 08:30 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-UG-2** **Lab ID: 60428021002** Collected: 05/03/23 14:58 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **458** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7440-42-8 | |
| Calcium | **115000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7439-89-6 | |
| Magnesium | **23200** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7439-95-4 | |
| Manganese | **35.3** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7439-96-5 | |
| Potassium | **4180** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7440-09-7 | |
| Sodium | **26000** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:16 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **355** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:09 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **496** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:23 | | D6 |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **37.2** | mg/L | 10.0 | 5.3 | 10 | | 05/12/23 08:57 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 08:44 | 16984-48-8 | |
| Sulfate | **51.8** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 08:57 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-DG-1** **Lab ID: 60428021003** Collected: 05/03/23 11:14 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **96.9J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7440-42-8 | |
| Calcium | **129000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7440-70-2 | |
| Iron | **296** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7439-89-6 | |
| Magnesium | **31000** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7439-95-4 | |
| Manganese | **44.3** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7439-96-5 | |
| Potassium | **3770** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7440-09-7 | |
| Sodium | **4110** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:18 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **450** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:15 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **499** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:23 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **3.6** | mg/L | 1.0 | 0.53 | 1 | | 05/12/23 09:10 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 09:10 | 16984-48-8 | |
| Sulfate | **29.5** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 09:24 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-DG-2** **Lab ID: 60428021004** Collected: 05/03/23 10:16 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **75.5J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7440-42-8 | |
| Calcium | **126000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7440-70-2 | |
| Iron | **156** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7439-89-6 | |
| Magnesium | **25600** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7439-95-4 | |
| Manganese | **216** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7439-96-5 | |
| Potassium | **6360** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7440-09-7 | |
| Sodium | **3920** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:20 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **428** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:35 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **481** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:24 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **2.8** | mg/L | 1.0 | 0.53 | 1 | | 05/12/23 09:37 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 09:37 | 16984-48-8 | |
| Sulfate | **28.4** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 09:50 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-DG-3** **Lab ID: 60428021005** Collected: 05/03/23 09:20 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **83.6J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7440-42-8 | |
| Calcium | **159000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7440-70-2 | |
| Iron | **238** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7439-89-6 | |
| Magnesium | **35600** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7439-95-4 | |
| Manganese | **526** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7439-96-5 | |
| Potassium | **5630** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7440-09-7 | |
| Sodium | **4830** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:22 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **480** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:42 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **640** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:24 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **6.9** | mg/L | 1.0 | 0.53 | 1 | | 05/12/23 10:04 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 10:04 | 16984-48-8 | |
| Sulfate | **76.3** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 11:24 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-DG-4** **Lab ID: 60428021006** Collected: 05/03/23 12:26 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **91.4J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7440-42-8 | |
| Calcium | **139000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7440-70-2 | |
| Iron | **17.0J** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7439-89-6 | |
| Magnesium | **43500** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7439-95-4 | |
| Manganese | **367** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7439-96-5 | |
| Potassium | **6640** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7440-09-7 | |
| Sodium | **15100** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:35 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **501** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 10:57 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **601** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:24 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **25.4** | mg/L | 10.0 | 5.3 | 10 | | 05/12/23 12:31 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 12:18 | 16984-48-8 | |
| Sulfate | **56.9** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 12:31 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-SCPC-DUP-1** **Lab ID: 60428021007** Collected: 05/03/23 08:00 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **93.7J** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7440-42-8 | |
| Calcium | **129000** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7440-70-2 | |
| Iron | **322** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7439-89-6 | |
| Magnesium | **31300** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7439-95-4 | |
| Manganese | **45.8** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7439-96-5 | |
| Potassium | **3790** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7440-09-7 | |
| Sodium | **4130** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:37 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **445** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 11:05 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **494** | mg/L | 10.0 | 10.0 | 1 | | 05/10/23 09:25 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **3.5** | mg/L | 1.0 | 0.53 | 1 | | 05/12/23 12:44 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 12:44 | 16984-48-8 | |
| Sulfate | **29.0** | mg/L | 10.0 | 5.5 | 10 | | 05/12/23 12:58 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-SCPC-FB-1** **Lab ID: 60428021008** Collected: 05/03/23 12:36 Received: 05/05/23 05:10 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **<6.4** | ug/L | 100 | 6.4 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7440-42-8 | |
| Calcium | **30.2J** | ug/L | 200 | 26.9 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7439-89-6 | |
| Magnesium | **<20.1** | ug/L | 50.0 | 20.1 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7439-95-4 | |
| Manganese | **<0.39** | ug/L | 5.0 | 0.39 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7439-96-5 | |
| Potassium | **<69.7** | ug/L | 500 | 69.7 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7440-09-7 | |
| Sodium | **<115** | ug/L | 500 | 115 | 1 | 05/11/23 11:53 | 05/15/23 10:39 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **<10.5** | mg/L | 20.0 | 10.5 | 1 | | 05/09/23 11:13 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **<5.0** | mg/L | 5.0 | 5.0 | 1 | | 05/10/23 09:25 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **0.55J** | mg/L | 1.0 | 0.53 | 1 | | 05/12/23 13:38 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/12/23 13:38 | 16984-48-8 | |
| Sulfate | **<0.55** | mg/L | 1.0 | 0.55 | 1 | | 05/12/23 13:38 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-BMW-1S** **Lab ID: 60427703001** Collected: 05/02/23 09:51 Received: 05/03/23 05:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.7 Metals, Total** | Analytical Method: EPA 200.7 Preparation Method: EPA 200.7<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **64.8J** | ug/L | 100 | 6.4 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7440-42-8 | |
| Calcium | **184000** | ug/L | 200 | 26.9 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7439-89-6 | |
| Magnesium | **37100** | ug/L | 50.0 | 20.1 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7439-95-4 | |
| Manganese | **849** | ug/L | 5.0 | 0.39 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7439-96-5 | |
| Potassium | **427J** | ug/L | 500 | 69.7 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7440-09-7 | |
| Sodium | **5130** | ug/L | 500 | 115 | 1 | 05/04/23 12:37 | 05/23/23 09:21 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **576** | mg/L | 20.0 | 10.5 | 1 | | 05/04/23 13:12 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **610** | mg/L | 10.0 | 10.0 | 1 | | 05/08/23 12:51 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **13.1** | mg/L | 1.0 | 0.53 | 1 | | 05/24/23 18:29 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/24/23 18:29 | 16984-48-8 | |
| Sulfate | **37.7** | mg/L | 20.0 | 11.0 | 20 | | 05/24/23 18:42 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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(913)599-5665

## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60428021

**Sample: S-BMW-3S** **Lab ID: 60427703002** Collected: 05/02/23 11:32 Received: 05/03/23 05:05 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **200.7 Metals, Total** | Analytical Method: EPA 200.7 Preparation Method: EPA 200.7<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **67.1J** | ug/L | 100 | 6.4 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7440-42-8 | |
| Calcium | **137000** | ug/L | 200 | 26.9 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7439-89-6 | |
| Magnesium | **24400** | ug/L | 50.0 | 20.1 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7439-95-4 | |
| Manganese | **30.2** | ug/L | 5.0 | 0.39 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7439-96-5 | |
| Potassium | **426J** | ug/L | 500 | 69.7 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7440-09-7 | |
| Sodium | **5360** | ug/L | 500 | 115 | 1 | 05/04/23 12:37 | 05/23/23 09:27 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **419** | mg/L | 20.0 | 10.5 | 1 | | 05/04/23 13:20 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **495** | mg/L | 10.0 | 10.0 | 1 | | 05/09/23 10:54 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **12.6** | mg/L | 1.0 | 0.53 | 1 | | 05/24/23 18:54 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 05/24/23 18:54 | 16984-48-8 | |
| Sulfate | **32.4** | mg/L | 20.0 | 11.0 | 20 | | 05/24/23 19:07 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 845219
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001, 60427703002

METHOD BLANK: 3349216 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 05/23/23 09:16 | |
| Calcium | ug/L | 28.7J | 200 | 26.9 | 05/23/23 09:16 | |
| Iron | ug/L | 9.3J | 50.0 | 9.1 | 05/23/23 09:16 | |
| Magnesium | ug/L | <20.1 | 50.0 | 20.1 | 05/23/23 09:16 | |
| Manganese | ug/L | 1.1J | 5.0 | 0.39 | 05/23/23 09:16 | |
| Potassium | ug/L | <69.7 | 500 | 69.7 | 05/23/23 09:16 | |
| Sodium | ug/L | <115 | 500 | 115 | 05/23/23 09:16 | |

LABORATORY CONTROL SAMPLE: 3349217

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | 1000 | 994 | 99 | 85-115 | |
| Calcium | ug/L | 10000 | 10500 | 105 | 85-115 | |
| Iron | ug/L | 10000 | 10500 | 105 | 85-115 | |
| Magnesium | ug/L | 10000 | 10200 | 102 | 85-115 | |
| Manganese | ug/L | 1000 | 1030 | 103 | 85-115 | |
| Potassium | ug/L | 10000 | 10200 | 102 | 85-115 | |
| Sodium | ug/L | 10000 | 10300 | 103 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3349218 3349219

| Parameter | Units | 60427703001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 64.8J | 1000 | 1000 | 1050 | 1050 | 98 | 98 | 70-130 | 0 | 20 | |
| Calcium | ug/L | 184000 | 10000 | 10000 | 191000 | 195000 | 73 | 109 | 70-130 | 2 | 20 | |
| Iron | ug/L | <9.1 | 10000 | 10000 | 10400 | 10400 | 104 | 104 | 70-130 | 0 | 20 | |
| Magnesium | ug/L | 37100 | 10000 | 10000 | 47000 | 47300 | 99 | 102 | 70-130 | 1 | 20 | |
| Manganese | ug/L | 849 | 1000 | 1000 | 1860 | 1890 | 102 | 104 | 70-130 | 1 | 20 | |
| Potassium | ug/L | 427J | 10000 | 10000 | 10900 | 10800 | 104 | 104 | 70-130 | 0 | 20 | |
| Sodium | ug/L | 5130 | 10000 | 10000 | 15600 | 15700 | 104 | 106 | 70-130 | 1 | 20 | |

MATRIX SPIKE SAMPLE: 3349220

| Parameter | Units | 60427703007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Boron | ug/L | 101 | 1000 | 1070 | 97 | 70-130 | |
| Calcium | ug/L | 132000 | 10000 | 139000 | 75 | 70-130 | |

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

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

MATRIX SPIKE SAMPLE: 3349220

| Parameter | Units | 60427703007 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Iron | ug/L | 143 | 10000 | 10200 | 100 | 70-130 | |
| Magnesium | ug/L | 28500 | 10000 | 37900 | 94 | 70-130 | |
| Manganese | ug/L | 216 | 1000 | 1200 | 99 | 70-130 | |
| Potassium | ug/L | 2250 | 10000 | 12500 | 102 | 70-130 | |
| Sodium | ug/L | 5580 | 10000 | 15800 | 102 | 70-130 | |

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

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846622
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

METHOD BLANK: 3354495 Matrix: Water
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 05/15/23 10:10 | |
| Calcium | ug/L | <26.9 | 200 | 26.9 | 05/15/23 10:10 | |
| Iron | ug/L | <9.1 | 50.0 | 9.1 | 05/15/23 10:10 | |
| Magnesium | ug/L | <20.1 | 50.0 | 20.1 | 05/15/23 10:10 | |
| Manganese | ug/L | <0.39 | 5.0 | 0.39 | 05/15/23 10:10 | |
| Potassium | ug/L | <69.7 | 500 | 69.7 | 05/15/23 10:10 | |
| Sodium | ug/L | <115 | 500 | 115 | 05/15/23 10:10 | |

LABORATORY CONTROL SAMPLE: 3354496

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | 1000 | 965 | 97 | 85-115 | |
| Calcium | ug/L | 10000 | 10200 | 102 | 85-115 | |
| Iron | ug/L | 10000 | 10100 | 101 | 85-115 | |
| Magnesium | ug/L | 10000 | 10000 | 100 | 85-115 | |
| Manganese | ug/L | 1000 | 962 | 96 | 85-115 | |
| Potassium | ug/L | 10000 | 9870 | 99 | 85-115 | |
| Sodium | ug/L | 10000 | 10100 | 101 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3354497 3354498

| Parameter | Units | 60428021005 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 | 1050 | 1060 | 97 | 98 | 70-130 | 1 | 20 | |
| Calcium | ug/L | 159000 | 10000 | 10000 | 171000 | 170000 | 111 | 102 | 70-130 | 1 | 20 | |
| Iron | ug/L | 238 | 10000 | 10000 | 10200 | 10200 | 100 | 99 | 70-130 | 0 | 20 | |
| Magnesium | ug/L | 35600 | 10000 | 10000 | 46100 | 45700 | 105 | 101 | 70-130 | 1 | 20 | |
| Manganese | ug/L | 526 | 1000 | 1000 | 1500 | 1480 | 97 | 95 | 70-130 | 1 | 20 | |
| Potassium | ug/L | 5630 | 10000 | 10000 | 15700 | 15800 | 101 | 102 | 70-130 | 1 | 20 | |
| Sodium | ug/L | 4830 | 10000 | 10000 | 14900 | 14700 | 101 | 99 | 70-130 | 1 | 20 | |

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## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 845171
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001, 60427703002

METHOD BLANK: 3349039 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | <10.5 | 20.0 | 10.5 | 05/04/23 11:49 | |

LABORATORY CONTROL SAMPLE: 3349040

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 500 | 503 | 101 | 90-110 | |

SAMPLE DUPLICATE: 3349041

| Parameter | Units | 60427704003 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 198 | 195 | 2 | 10 | |

SAMPLE DUPLICATE: 3349299

| Parameter | Units | 60427707001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 160 | 163 | 2 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846049
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

METHOD BLANK: 3352393 Matrix: Water
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | <10.5 | 20.0 | 10.5 | 05/09/23 09:16 | |

LABORATORY CONTROL SAMPLE: 3352394

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 500 | 504 | 101 | 90-110 | |

SAMPLE DUPLICATE: 3352395

| Parameter | Units | 60428021005 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 480 | 476 | 1 | 10 | |

SAMPLE DUPLICATE: 3352396

| Parameter | Units | 60428015002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 451 | 454 | 1 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 845831
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001

METHOD BLANK: 3351717 Matrix: Water
Associated Lab Samples: 60427703001

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 05/08/23 12:49 | |

LABORATORY CONTROL SAMPLE: 3351718

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

SAMPLE DUPLICATE: 3351719

| Parameter | Units | 60427607001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 3540 | 3470 | 2 | 10 | |

SAMPLE DUPLICATE: 3351720

| Parameter | Units | 60427705002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | ND | <5.0 | | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846023
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60427703002

METHOD BLANK: 3352331 Matrix: Water
Associated Lab Samples: 60427703002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 05/09/23 10:54 | |

LABORATORY CONTROL SAMPLE: 3352332

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 1030 | 103 | 80-120 | |

SAMPLE DUPLICATE: 3352333

| Parameter | Units | 60427707001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 957 | 916 | 4 | 10 | |

SAMPLE DUPLICATE: 3352334

| Parameter | Units | 60427777001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 972 | 913 | 6 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846260
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60428021001

METHOD BLANK: 3353152 Matrix: Water
Associated Lab Samples: 60428021001

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 05/10/23 09:20 | |

LABORATORY CONTROL SAMPLE: 3353153

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 974 | 97 | 80-120 | |

SAMPLE DUPLICATE: 3353154

| Parameter | Units | 60427854002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 2740 | 2870 | 5 | 10 | |

SAMPLE DUPLICATE: 3353156

| Parameter | Units | 60427860002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 445 | 445 | 0 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846264
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

METHOD BLANK: 3353161 Matrix: Water
Associated Lab Samples: 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 05/10/23 09:23 | |

LABORATORY CONTROL SAMPLE: 3353162

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

SAMPLE DUPLICATE: 3353163

| Parameter | Units | 60428021005 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 640 | 646 | 1 | 10 | D6 |

SAMPLE DUPLICATE: 3353164

| Parameter | Units | 60428144001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 426 | 463 | 8 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 846459
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

METHOD BLANK: 3353923 Matrix: Water
Associated Lab Samples: 60428021001, 60428021002, 60428021003, 60428021004, 60428021005, 60428021006, 60428021007, 60428021008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 05/11/23 18:45 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 05/11/23 18:45 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 05/11/23 18:45 | |

LABORATORY CONTROL SAMPLE: 3353924

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 4.8 | 95 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.4 | 96 | 90-110 | |
| Sulfate | mg/L | 5 | 4.9 | 98 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353925 3353926

| Parameter | Units | 60428015002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 1.9 | 5 | 5 | 7.1 | 7.0 | 105 | 104 | 80-120 | 1 | 15 | |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.9 | 2.9 | 116 | 114 | 80-120 | 1 | 15 | |
| Sulfate | mg/L | 39.7 | 50 | 50 | 105 | 94.5 | 130 | 110 | 80-120 | 10 | 15 | M1 |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353928 3353929

| Parameter | Units | 60428019003 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 3.6 | 5 | 5 | 9.0 | 9.3 | 107 | 114 | 80-120 | 4 | 15 | |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.7 | 2.9 | 109 | 116 | 80-120 | 7 | 15 | |
| Sulfate | mg/L | 40.9 | 50 | 50 | 95.7 | 95.2 | 110 | 109 | 80-120 | 1 | 15 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353931 3353932

| Parameter | Units | 60428021005 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 6.9 | 5 | 5 | 12.6 | 12.7 | 114 | 117 | 80-120 | 1 | 15 | |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.9 | 2.9 | 114 | 116 | 80-120 | 2 | 15 | |

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

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3353931 3353932

| Parameter | Units | 60428021005 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | mg/L | 76.3 | 50 | 50 | 128 | 129 | 103 | 106 | 80-120 | 1 | 15 | |

SAMPLE DUPLICATE: 3353927

| Parameter | Units | 60428015002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 1.9 | 1.9 | 0 | 15 | |
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |
| Sulfate | mg/L | 39.7 | 39.0 | 2 | 15 | |

SAMPLE DUPLICATE: 3353930

| Parameter | Units | 60428019003 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 3.6 | 3.9 | 7 | 15 | |
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |
| Sulfate | mg/L | 40.9 | 41.9 | 2 | 15 | |

SAMPLE DUPLICATE: 3353933

| Parameter | Units | 60428021005 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 6.9 | 6.9 | 1 | 15 | |
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |
| Sulfate | mg/L | 76.3 | 70.6 | 8 | 15 | |

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## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60428021

QC Batch: 848462
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60427703001, 60427703002

METHOD BLANK: 3361725 Matrix: Water
Associated Lab Samples: 60427703001, 60427703002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 05/24/23 09:13 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 05/24/23 09:13 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 05/24/23 09:13 | |

LABORATORY CONTROL SAMPLE: 3361726

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 4.8 | 95 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.5 | 101 | 90-110 | |
| Sulfate | mg/L | 5 | 5.0 | 101 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3361727 3361728

| Parameter | Units | 60428838004 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 1.6 | 5 | 5 | 6.0 | 6.2 | 88 | 91 | 80-120 | 3 | 15 | |
| Fluoride | mg/L | 0.21 | 2.5 | 2.5 | 2.7 | 2.7 | 98 | 101 | 80-120 | 3 | 15 | |
| Sulfate | mg/L | 193 | 250 | 250 | 450 | 427 | 103 | 94 | 80-120 | 5 | 15 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALIFIERS

Project: AMEREN SCPC
Pace Project No.: 60428021

## DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

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

TNI - The NELAC Institute.

## ANALYTE QUALIFIERS

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

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

# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60428021

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60427703001** | **S-BMW-1S** | EPA 200.7 | 845219 | EPA 200.7 | 845416 |
| **60427703002** | **S-BMW-3S** | EPA 200.7 | 845219 | EPA 200.7 | 845416 |
| **60428021001** | **S-UG-1A** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021002** | **S-UG-2** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021003** | **S-DG-1** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021004** | **S-DG-2** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021005** | **S-DG-3** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021006** | **S-DG-4** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021007** | **S-SCPC-DUP-1** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60428021008** | **S-SCPC-FB-1** | EPA 200.7 | 846622 | EPA 200.7 | 846678 |
| **60427703001** | **S-BMW-1S** | SM 2320B | 845171 | | |
| **60427703002** | **S-BMW-3S** | SM 2320B | 845171 | | |
| **60428021001** | **S-UG-1A** | SM 2320B | 846049 | | |
| **60428021002** | **S-UG-2** | SM 2320B | 846049 | | |
| **60428021003** | **S-DG-1** | SM 2320B | 846049 | | |
| **60428021004** | **S-DG-2** | SM 2320B | 846049 | | |
| **60428021005** | **S-DG-3** | SM 2320B | 846049 | | |
| **60428021006** | **S-DG-4** | SM 2320B | 846049 | | |
| **60428021007** | **S-SCPC-DUP-1** | SM 2320B | 846049 | | |
| **60428021008** | **S-SCPC-FB-1** | SM 2320B | 846049 | | |
| **60427703001** | **S-BMW-1S** | SM 2540C | 845831 | | |
| **60427703002** | **S-BMW-3S** | SM 2540C | 846023 | | |
| **60428021001** | **S-UG-1A** | SM 2540C | 846260 | | |
| **60428021002** | **S-UG-2** | SM 2540C | 846264 | | |
| **60428021003** | **S-DG-1** | SM 2540C | 846264 | | |
| **60428021004** | **S-DG-2** | SM 2540C | 846264 | | |
| **60428021005** | **S-DG-3** | SM 2540C | 846264 | | |
| **60428021006** | **S-DG-4** | SM 2540C | 846264 | | |
| **60428021007** | **S-SCPC-DUP-1** | SM 2540C | 846264 | | |
| **60428021008** | **S-SCPC-FB-1** | SM 2540C | 846264 | | |
| **60427703001** | **S-BMW-1S** | EPA 300.0 | 848462 | | |
| **60427703002** | **S-BMW-3S** | EPA 300.0 | 848462 | | |
| **60428021001** | **S-UG-1A** | EPA 300.0 | 846459 | | |
| **60428021002** | **S-UG-2** | EPA 300.0 | 846459 | | |
| **60428021003** | **S-DG-1** | EPA 300.0 | 846459 | | |
| **60428021004** | **S-DG-2** | EPA 300.0 | 846459 | | |
| **60428021005** | **S-DG-3** | EPA 300.0 | 846459 | | |
| **60428021006** | **S-DG-4** | EPA 300.0 | 846459 | | |
| **60428021007** | **S-SCPC-DUP-1** | EPA 300.0 | 846459 | | |
| **60428021008** | **S-SCPC-FB-1** | EPA 300.0 | 846459 | | |

| Pace ANALYTICAL SERVICES | DC#_Title: ENV-FRM-LENE-0009_Samp | WO# : 60428021 |
|---|---|---|
| | Revision: 2 | Effective Date: 01/12/20 |

Client Name: Rocksmith

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

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

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

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

**Thermometer Used:** T-299 **Type of Ice:** (Wet) Blue None

**Cooler Temperature (°C):** **As-read** 1.6/0.1/2.3 **Corr. Factor** +0.2 **Corrected** 1.8/0.3/2.5

**Date and initials of person examining contents:** 5/5

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

# CHAIN-OF-CUSTODY / Analytical Request Document

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

Pace Analytical™ www.pacelabs.com

Page: 1 of 1

| Section A Required Client Information: | | Section B Required Project Information: | | Section C Invoice Information: | |
|---|---|---|---|---|---|
| Company: | Rocksmith Geoengineers, LLC. | Report To: | Mark Haddock | Attention: | |
| Address: | 5233 Roanoke Drive | Copy To: | Jeffrey Ingram | Company Name: | Rocksmith |
| | St. Charles, MO 63304 | | | Address: | |
| Email To: | mark.haddock@rocksmithgeo.com | Purchase Order No.: | | Pace Quote Reference: | |
| Phone: | 314-974-6578 Fax: | Project Name: | AMEREN SCPC | Pace Project Manager: | Jamie Church |
| Requested Due Date/TAT: | Standard | Project Number: | COC #10 | Pace Profile #: | 15856, line 2 |

REGULATORY AGENCY: NPDES, GROUND WATER, DRINKING WATER, UST, RCRA, OTHER _____

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

Requested Analysis Filtered (Y/N)

| 2 | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED: COMPOSITE START DATE | COMPOSITE START TIME | COMPOSITE END/GRAB DATE | COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test ↓ Y/N | Chloride/Fluoride/Sulfate | App III and Cat/An Metals | Alkalinity | TDS | Appendix IV Metals ** | Mercury | Radium 226 | Radium 228 | Ferrous/Ferric Iron | SM4500-S2D Sulfide | | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | Y/N | N | N | N | N | N | N | N | N | N | N | | |
| 1 | S-UG-1A | WT | G | | | 5-3-23 | 1353 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 2 | S-UG-2 | WT | G | | | 5-3-23 | 1458 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 3 | S-DG-1 | WT | G | | | 5-3-23 | 1114 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 4 | S-DG-2 | WT | G | | | 5-3-23 | 1016 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 5 | S-DG-3 | WT | G | | | 5-3-23 | 0920 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 6 | S-DG-4 | WT | G | | | 5-3-23 | 1226 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 7 | S-SCPC-DUP-1 | WT | G | | | 5-3-23 | — | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 8 | S-SCPC-FB-1 | WT | G | | | 5-3-23 | 1236 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | |
| 9 | S-SCPC-MS-1 | WT | G | | | 5-3-23 | 0920 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | Collected @ S-DG-3 |
| 10 | S-SCPC-MSD-1 | WT | G | | | 5-3-23 | 0920 | | 2 | 1 | | 1 | | | | | | | ✓ | ✓ | ✓ | ✓ | | | | | | | | Collected @ S-DG-3 |
| 11 | S-BMW-1S | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | S-BMW-3S | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | | | |

6042821

Pace Project No./ Lab I.D.

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *App III and Cat/An Metals* - EPA 200.7 - B, Ca, Fe, Mg, Mn, K, Na | Grant Morey / WSP | 5-4-23 | 1600 | [illegible] Pace | 5/5 | 0850 | 1.8 | Y | Y | Y |
| **- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl | | | | | | | 0-3 | | | |
| | | | | | | | 2.5 | | | |
| Radium 226/228 to Pace PA | | | | | | | | | | |

| SAMPLER NAME AND SIGNATURE | | | | |
|---|---|---|---|---|
| PRINT Name of SAMPLER: | Grant Morey | Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N) |
| SIGNATURE of SAMPLER: | [signature] DATE Signed (MM/DD/YY): 05/04/23 | | | | |

# Memorandum

**June 27, 2023**

| | | | |
|---|---|---|---|
| **To:** | Project File<br>Rocksmith Geoengineering, LLC | **Project Number:** | 23009 |
| **CC:** | Mark Haddock, Jeffrey Ingram | | |
| **From:** | Grant Morey | **Email:** | Grant.Morey@Rocksmithgeo.com |
| **RE:** | **Data Validation Summary, Sioux Energy Center – SCPC – Data Package 60428021** | | |

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC
Project Number: 23009
Reviewer: G. Morey
Validation Date: 6/27/2023

Laboratory: Pace Analytical
SDG #: 60428021
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names S-UG-1A, S-UG-2, S-DG-1, S-DG-2, S-DG-3, S-DG-4, S-SCPC-DUP-1, S-SCPC-FB-1, S-BMW-1S, S-BMW-3S

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

| Field Information | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Sampling dates noted? | x | | | 5/2/2023 - 5/3/2023 |
| b) Sampling team indicated? | x | | | GTM |
| c) Sample location noted? | x | | | |
| d) Sample depth indicated (Soils)? | | | x | |
| e) Sample type indicated (grab/composite)? | x | | | Grab |
| f) Field QC noted? | x | | | See Notes |
| g) Field parameters collected (note types)? | x | | | pH, Spec Cond, Turb, Temp, DO, ORP |
| h) Field Calibration within control limits? | x | | | |
| i) Notations of unacceptable field conditions/performances from field logs or field notes? | | x | | |
| j) Does the laboratory narrative indicate deficiencies? | | | x | No lab narrative. |

Note Deficiencies:

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

**Comments/Notes:**

General:

Chloride and/or Sulfate were diluted in some samples; no qualification necessary.

Method Blanks:

3349216: Calcium (28.7J), Iron (9.3J), and Manganese (1.1J). Associated with samples -001 and -002.

Calcium and Manganese results > RL and 10x blank, no qualification necessary. Iron results non-detect, no qualification.

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Comments/Notes:**

Field Blanks:

S-SCPC-FB-1 @ S-DG-4: Calcium (30.2J) and Chloride (0.55J). Results > RL and 10x blank, no qualification necessary.

Duplicates:

S-SCPC-DUP-1 @ S-DG-1: all RPD's within control limits (20%).

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

MS/MSD:

3353925/3353926: MS recovery high for Sulfate (RPD is within limits) only one QC indicator out: no qualification necessary.

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

| Sample Name | Constituent(s) | Result | Qualifier | Reason |
|---|---|---|---|---|
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Signature: Grant Morey Date: 06/27/2023

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

July 25, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
5233 Roanoke Drive
Saint Charles, MO 63304

RE: Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 12, 2023. 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.
Grant Morey, Rocksmith Geoengineering, LLC.

**Pace Analytical Services, LLC**
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## CERTIFICATIONS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

**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 #: T104704407-22-16
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

**Pace Analytical Services, LLC**
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(913)599-5665

## SAMPLE SUMMARY

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60432876001** | **S-UG-2** | Water | 07/11/23 09:07 | 07/12/23 04:58 |
| **60432876002** | **S-DG-3** | Water | 07/11/23 11:45 | 07/12/23 04:58 |
| **60432876003** | **S-SCPC-DUP-1** | Water | 07/11/23 00:00 | 07/12/23 04:58 |
| **60432876004** | **S-SCPC-FB-1** | Water | 07/11/23 11:45 | 07/12/23 04:58 |

**Pace Analytical Services, LLC**
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## SAMPLE ANALYTE COUNT

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60432876001** | **S-UG-2** | EPA 200.7 | MA1 | 1 | PASI-K |
| **60432876002** | **S-DG-3** | EPA 200.7 | MA1 | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 1 | PASI-K |
| **60432876003** | **S-SCPC-DUP-1** | EPA 200.7 | MA1 | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 1 | PASI-K |
| **60432876004** | **S-SCPC-FB-1** | EPA 200.7 | MA1 | 1 | PASI-K |
| | | EPA 300.0 | CRN2 | 1 | PASI-K |

PASI-K = Pace Analytical Services - Kansas City

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

**Sample: S-UG-2** **Lab ID: 60432876001** Collected: 07/11/23 09:07 Received: 07/12/23 04:58 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **291** | ug/L | 100 | 6.4 | 1 | 07/18/23 13:01 | 07/24/23 15:50 | 7440-42-8 | |

## REPORT OF LABORATORY ANALYSIS

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

## ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

**Sample: S-DG-3** **Lab ID: 60432876002** Collected: 07/11/23 11:45 Received: 07/12/23 04:58 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **82.5J** | ug/L | 100 | 6.4 | 1 | 07/18/23 13:01 | 07/24/23 15:57 | 7440-42-8 | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Sulfate | **75.8** | mg/L | 10.0 | 5.5 | 10 | | 07/18/23 16:56 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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(913)599-5665

## ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

**Sample: S-SCPC-DUP-1** **Lab ID: 60432876003** Collected: 07/11/23 00:00 Received: 07/12/23 04:58 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **82.2J** | ug/L | 100 | 6.4 | 1 | 07/18/23 13:01 | 07/24/23 16:04 | 7440-42-8 | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Sulfate | **73.7** | mg/L | 10.0 | 5.5 | 10 | | 07/18/23 18:12 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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## ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

**Sample: S-SCPC-FB-1** **Lab ID: 60432876004** Collected: 07/11/23 11:45 Received: 07/12/23 04:58 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **<6.4** | ug/L | 100 | 6.4 | 1 | 07/18/23 13:01 | 07/24/23 16:06 | 7440-42-8 | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Sulfate | **<0.55** | mg/L | 1.0 | 0.55 | 1 | | 07/18/23 18:25 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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(913)599-5665

# QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

QC Batch: 856954
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60432876001, 60432876002, 60432876003, 60432876004

METHOD BLANK: 3393503 Matrix: Water
Associated Lab Samples: 60432876001, 60432876002, 60432876003, 60432876004

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 07/24/23 15:20 | |

LABORATORY CONTROL SAMPLE: 3393504

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393505 3393506

| Parameter | Units | 60432860001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 299 | 1000 | 1000 | 1290 | 1280 | 99 | 98 | 70-130 | 1 | 20 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393507 3393508

| Parameter | Units | 60432876001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 291 | 1000 | 1000 | 1250 | 1240 | 96 | 95 | 70-130 | 1 | 20 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3393509 3393510

| Parameter | Units | 60432876002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 82.5J | 1000 | 1000 | 1040 | 1060 | 96 | 98 | 70-130 | 1 | 20 | |

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

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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# QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

QC Batch: 856699
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60432876002, 60432876003, 60432876004

METHOD BLANK: 3392849 Matrix: Water
Associated Lab Samples: 60432876002, 60432876003, 60432876004

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 07/18/23 08:52 | |

LABORATORY CONTROL SAMPLE: 3392850

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Sulfate | mg/L | 5 | 5.0 | 100 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3392851 3392852

| Parameter | Units | 60432864004 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | mg/L | 70.0 | 5 | 5 | 74.7 | 75.3 | 94 | 106 | 80-120 | 1 | 15 | E |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3392854 3392855

| Parameter | Units | 60432876002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | mg/L | 75.8 | 50 | 50 | 126 | 124 | 101 | 96 | 80-120 | 2 | 15 | |

SAMPLE DUPLICATE: 3392853

| Parameter | Units | 60432864004 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Sulfate | mg/L | 70.0 | 69.9 | 0 | 15 | E |

SAMPLE DUPLICATE: 3392856

| Parameter | Units | 60432876002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Sulfate | mg/L | 75.8 | 72.3 | 5 | 15 | |

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

## REPORT OF LABORATORY ANALYSIS

**Pace Analytical Services, LLC**
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(913)599-5665

# QUALIFIERS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

## 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

| | |
|---|---|
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |

**Pace Analytical Services, LLC**
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(913)599-5665

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60432876

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60432876001** | **S-UG-2** | EPA 200.7 | 856954 | EPA 200.7 | 856964 |
| **60432876002** | **S-DG-3** | EPA 200.7 | 856954 | EPA 200.7 | 856964 |
| **60432876003** | **S-SCPC-DUP-1** | EPA 200.7 | 856954 | EPA 200.7 | 856964 |
| **60432876004** | **S-SCPC-FB-1** | EPA 200.7 | 856954 | EPA 200.7 | 856964 |
| **60432876002** | **S-DG-3** | EPA 300.0 | 856699 | | |
| **60432876003** | **S-SCPC-DUP-1** | EPA 300.0 | 856699 | | |
| **60432876004** | **S-SCPC-FB-1** | EPA 300.0 | 856699 | | |

| Pace ANALYTICAL SERVICES | DC#_Title: ENV-FRM-LENE-0009_San | WO# : 60432876 |
|---|---|---|
| | Revision: 2 | Effective Date: 01/12/ |

60432876

Client Name: Rocksmith

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

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

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

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

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

**Cooler Temperature (°C):** **As-read** 1.5 **Corr. Factor** +0.2 **Corrected** 1.7

**Date and initials of person examining contents:** 07.12.2023 K

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Pace Analytical
www.pacelabs.com

# CHAIN-OF-CUSTODY / Analytical Request Document

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



**Section A** Required Client Information:

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

**Section B** Required Project Information:

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

**Section C** Invoice Information:

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

**REGULATORY AGENCY**

NPDES ☑ GROUND WATER ☐ DRINKING WATER

UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

**Section D** Required Client Information

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

Valid Matrix Codes

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

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COMPOSITE START TIME | COMPOSITE END/GRAB DATE | COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | TDS | Sulfate | Chloride | Boron | TOX | Calcium | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | Requested Analysis Filtered (Y/N) | N | N | N | N | N | N | | 6043 2876 |
| 1 | S-DG-2 | WT | G | | | 7/11 | 937 | | 1 | | | | | | | | | | | | 1 | | | | |
| 2 | S-DG-3 | WT | G | | | " | 1145 | | 1 | | | | | | | | | | | 1 | | 1 | | | |
| 3 | S-SCPC-MS | WT | G | | | " | " | | " | | | | | | | | | | | " | | " | | | Collected at DG-3 |
| 4 | S-SCPC-MSD | WT | G | | | " | " | | " | | | | | | | | | | | " | | " | | | " |
| 5 | S-SCPC-DUP-1 | WT | G | | | " | " | | " | | | | | | | | | | | " | | " | | | |
| 6 | S-SCPC-FB-1 | WT | G | | | " | " | | " | | | | | | | | | | | " | | " | | | |
| 7 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | WT | G | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | J. Ingram / Rocksmith | 7/11/23 | 1330 | | 7-12-23 | 0456 | 1.7 | Y | Y | -1 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: J. Ingram

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 7/11/23

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

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

Client: Rocksmith Profile #

Site: Ameren Vcs. Samp. 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 | | | | | | RQS | RQS | | | | | | | | | | | | | | | 3 | | | | | | | | | |
| 2 | WT | | | | | RQS | | | | | | | | | | | | | | 3 | | | 3 | | | | | | | | | |
| 3 | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | — | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | WT | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | |
| 6 | WT | | | | | | | | | | | | | | | | | | | 1 | | | 1 | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Container Codes

| Glass | | | | Plastic | | Misc. | |
|---|---|---|---|---|---|---|---|
| DG9B | 40mL bisulfate clear vial | WGKU | 8oz clear soil jar | BP1C | 1L NAOH plastic | I | Wipe/Swab |
| DG9H | 40mL HCl amber voa vial | WGFU | 4oz clear soil jar | BP1N | 1L HNO3 plastic | SP5T | 120mL Coliform Na Thiosulfate |
| DG9M | 40mL MeOH clear vial | WG2U | 2oz clear soil jar | BP1S | 1L H2SO4 plastic | ZPLC | Ziploc Bag |
| DG9Q | 40mL TSP amber vial | JGFU | 4oz unpreserved amber wide | BP1U | 1L unpreserved plastic | AF | Air Filter |
| DG9S | 40mL H2SO4 amber vial | AG0U | 100mL unores amber glass | BP1Z | 1L NaOH, Zn Acetate | C | Air Cassettes |
| DG9T | 40mL Na Thio amber vial | AG1H | 1L HCl amber glass | BP2C | 500mL NAOH plastic | R | Terracore Kit |
| DG9U | 40mL amber unpreserved | AG1S | 1L H2SO4 amber glass | BP2N | 500mL HNO3 plastic | U | Summa Can |
| VG9H | 40mL HCl clear vial | AG1T | 1L Na Thiosulfate clear/amber glass | BP2S | 500mL H2SO4 plastic | | |
| VG9T | 40mL Na Thio. clear vial | AG1U | 1liter unpres amber glass | BP2U | 500mL unpreserved plastic | | |
| VG9U | 40mL unpreserved clear vial | AG2N | 500mL HNO3 amber glass | BP2Z | 500mL NaOH, Zn Acetate | Matrix | |
| BG1S | 1liter H2SO4 clear glass | AG2S | 500mL H2SO4 amber glass | BP3C | 250mL NaOH plastic | | |
| BG1U | 1liter unpres glass | AG3S | 250mL H2SO4 amber glass | BP3F | 250mL HNO3 plastic - field filtered | WT | Water |
| BG3H | 250mL HCL Clear glass | AG2U | 500mL unpres amber glass | BP3N | 250mL HNO3 plastic | SL | Solid |
| BG3U | 250mL Unpres Clear glass | AG3U | 250mL unpres amber glass | BP3U | 250mL unpreserved plastic | NAL | Non-aqueous Liquid |
| WGDU | 16oz clear soil jar | AG4U | 125mL unpres amber glass | BP3S | 250mL H2SO4 plastic | OL | OIL |
| | | AG5U | 100mL unpres amber glass | BP3Z | 250mL NaOH, Zn Acetate | WP | Wipe |
| | | | | BP4U | 125mL unpreserved plastic | DW | Drinking Water |
| | | | | BP4N | 125mL HNO3 plastic | | |
| | | | | BP4S | 125mL H2SO4 plastic | | |
| | | | | WPDU | 16oz unpresserved plstic | | |

Work Order Number: 60432876

# Memorandum

**August 16, 2023**

| | | | |
|---|---|---|---|
| **To:** | Project File<br>Rocksmith Geoengineering, LLC | **Project Number:** | 23009 |
| **CC:** | Mark Haddock, Jeffrey Ingram | | |
| **From:** | Grant Morey | **Email:** | Grant.Morey@Rocksmithgeo.com |
| **RE:** | **Data Validation Summary, Sioux Energy Center – SCPC Verification – Data Package 60432876** | | |

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC Verification
Project Number: 23009
Reviewer: G. Morey
Validation Date: 8/16/2023

Laboratory: Pace Analytical
SDG #: 60432876
Analytical Method (type and no.): EPA 200.7 (Boron), EPA 300.0 (Sulfate)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-UG-2, S-DG-3, S-SCPC-DUP-1, S-SCPC-FB-1

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

| Field Information | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Sampling dates noted? | x | | | 7/11/2023 |
| b) Sampling team indicated? | x | | | JSI |
| c) Sample location noted? | x | | | |
| d) Sample depth indicated (Soils)? | | | x | |
| e) Sample type indicated (grab/composite)? | x | | | Grab |
| f) Field QC noted? | x | | | See Notes |
| g) Field parameters collected (note types)? | x | | | pH, Spec Cond, Turb, Temp, DO, ORP |
| h) Field Calibration within control limits? | x | | | |
| i) Notations of unacceptable field conditions/performances from field logs or field notes? | | x | | |
| j) Does the laboratory narrative indicate deficiencies? | | | x | No lab narrative. |

Note Deficiencies: _____

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

| Duplicates | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Were field duplicates collected (note original and duplicate sample names)? | ☒ | ☐ | ☐ | S-SCPC-DUP-1 @ S-DG-3 |
| b) Were field dup. precision criteria met (note RPD)? | ☒ | ☐ | ☐ | RPD = 0.4% (Boron), 2.8% (Sulfate) |
| c) Were lab duplicates analyzed (note original and duplicate samples)? | ☒ | ☐ | ☐ | Lab duplicates analyzed for Sulfate |
| d) Were lab dup. precision criteria met (note RPD)? | ☒ | ☐ | ☐ | RPDs: 0%, 5% |

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

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

**Comments/Notes:**

No qualifications necessary.

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

| Sample Name | Constituent(s) | Result | Qualifier | Reason |
|---|---|---|---|---|
| | | | | |
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Signature: Grant Morey Date: 08/16/2023

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

August 15, 2023

Mark Haddock
Rocksmith Geoengineering, LLC.
5233 Roanoke Drive
Saint Charles, MO 63304

RE: Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on August 02, 2023. 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.
Grant Morey, Rocksmith Geoengineering, LLC.

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

## CERTIFICATIONS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

**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 #: T104704407-22-16
Utah Certification #: KS000212022-12
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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

## SAMPLE SUMMARY

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60434384001** | **S-DG-3** | Water | 08/01/23 14:43 | 08/02/23 05:13 |

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

## SAMPLE ANALYTE COUNT

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60434384001** | **S-DG-3** | SM 2540C | BDH1 | 1 | PASI-K |

PASI-K = Pace Analytical Services - Kansas City

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

## ANALYTICAL RESULTS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

**Sample: S-DG-3** **Lab ID: 60434384001** Collected: 08/01/23 14:43 Received: 08/02/23 05:13 Matrix: Water

| Parameters | Results | Units | PQL | MDL | DF | Prepared | Analyzed | CAS No. | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **665** | mg/L | 10.0 | 10.0 | 1 | | 08/04/23 09:38 | | |

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

QC Batch: 859217
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60434384001

METHOD BLANK: 3402514 Matrix: Water
Associated Lab Samples: 60434384001

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 08/04/23 09:35 | |

LABORATORY CONTROL SAMPLE: 3402515

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

SAMPLE DUPLICATE: 3402516

| Parameter | Units | 60434305001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1330 | 1350 | 1 | 10 | |

SAMPLE DUPLICATE: 3402517

| Parameter | Units | 60434553002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1090 | 1090 | 0 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALIFIERS

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

**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.

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

## QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN-VERIFICATION, SCPC
Pace Project No.: 60434384

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60434384001** | **S-DG-3** | SM 2540C | 859217 | | |

| Pace ANALYTICAL SERVICES | DC#_Title: ENV-FRM-LENE-0009_S | WO# : 60434384 |
|---|---|---|
| | Revision: 2 | Effective Date: 01/1 |

60434384

Client Name: Rocksmith

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

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

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

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

**Thermometer Used:** T-291 **Type of Ice:** (Wet) Blue None

**Cooler Temperature (°C):** **As-read** 0.3 **Corr. Factor** +0.2 **Corrected** 0.5

**Date and initials of person examining contents:** BC 8/2

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Qualtrax Document ID: 30468

Page 1 of 1

Pace Analytical
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# CHAIN-OF-CUSTODY / Analytical Request Document

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



**Section A** Required Client Information:

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

**Section B** Required Project Information:

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

**Section C** Invoice Information:

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

**REGULATORY AGENCY**

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

Site Location STATE: MO

**Section D** Required Client Information

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

Valid Matrix Codes

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

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED COMPOSITE START DATE | COLLECTED COMPOSITE START TIME | COLLECTED COMPOSITE END/GRAB DATE | COLLECTED COMPOSITE END/GRAB TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test Y/N | TDS | Sulfate | Chloride | Boron | TOX | Calcium | | | | | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | DATE | TIME | DATE | TIME | | | | | | | | | | | Y/N | N | N | N | N | N | N | N | N | N | | 60434384 |
| 1 | S-DG-3 | WT | G | | | 8-1-23 | 1443 | | 1 | 1 | | | | | | | | | ✓ | ✓ | | | | | | | | TDS only |
| 2 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | WT | G | | | | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Grant Morey / Rocksmith | 8-1-23 | 1600 | BC Pace | 8/2 | 0513 | 0.5 | Y | Y | Y |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: Grant Morey

SIGNATURE of SAMPLER: Grant Morey

DATE Signed (MM/DD/YY): 08/01/23

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

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

Client: Rocksmith

Profile # 15856 Liel

Site: Ameren-Verification Sampling SCPC

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 | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Container Codes

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

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

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

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

Work Order Number: 60434384

# Memorandum

**August 16, 2023**

| | | | |
|---|---|---|---|
| **To:** | Project File<br>Rocksmith Geoengineering, LLC | **Project Number:** | 23009 |
| **CC:** | Mark Haddock, Jeffrey Ingram | | |
| **From:** | Grant Morey | **Email:** | Grant.Morey@Rocksmithgeo.com |
| **RE:** | **Data Validation Summary, Sioux Energy Center – SCPC Verification – Data Package 60434384** | | |

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

- None.

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Rocksmith Geoengineering
Project Manager: J. Ingram
Project Name: Ameren SCPC Verification
Project Number: 23009
Reviewer: G. Morey
Validation Date: 8/16/2023

Laboratory: Pace Analytical
SDG #: 60434384
Analytical Method (type and no.): SM 2540C (TDS)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-DG-3

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

| Field Information | YES | NO | NA | COMMENTS |
|---|---|---|---|---|
| a) Sampling dates noted? | x | | | 8/1/2023 |
| b) Sampling team indicated? | x | | | GTM |
| c) Sample location noted? | x | | | |
| d) Sample depth indicated (Soils)? | | | x | |
| e) Sample type indicated (grab/composite)? | x | | | Grab |
| f) Field QC noted? | | x | | No field QC collected, additional sample |
| g) Field parameters collected (note types)? | x | | | pH, Spec Cond, Turb, Temp, DO, ORP |
| h) Field Calibration within control limits? | x | | | |
| i) Notations of unacceptable field conditions/performances from field logs or field notes? | | x | | |
| j) Does the laboratory narrative indicate deficiencies? | | | x | No lab narrative. |

Note Deficiencies: _____

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

| **Duplicates** | **YES** | **NO** | **NA** | **COMMENTS** |
|---|---|---|---|---|
| a) Were field duplicates collected (note original and duplicate sample names)? | ☐ | ☒ | ☐ | |
| b) Were field dup. precision criteria met (note RPD)? | ☐ | ☐ | ☒ | |
| c) Were lab duplicates analyzed (note original and duplicate samples)? | ☒ | ☐ | ☐ | |
| d) Were lab dup. precision criteria met (note RPD)? | ☒ | ☐ | ☐ | RPDs: 0%, 1% |

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

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

**Comments/Notes:**

No qualifications necessary. No field QC collected, follow-up sample to SCPC verification sampling event.

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

| Sample Name | Constituent(s) | Result | Qualifier | Reason |
|---|---|---|---|---|
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Signature: Grant Morey Date: 08/16/2023

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

January 22, 2024

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

RE: Project: AMEREN SCPC
Pace Project No.: 60442112

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 11, 2023 and November 15, 2023. 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

REV-1, 1/20/24: Sample UG-2 added to report.

REV-2, 1/22/34: Samples S-BMW-1S and S-BMW-3S added to report.

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.
Grant Morey, Rocksmith Geoengineering, LLC.

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

## CERTIFICATIONS

Project: AMEREN SCPC
Pace Project No.: 60442112

**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

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

## SAMPLE SUMMARY

Project: AMEREN SCPC
Pace Project No.: 60442112

| Lab ID | Sample ID | Matrix | Date Collected | Date Received |
|---|---|---|---|---|
| **60442112001** | **S-UG-1A** | Water | 11/13/23 09:45 | 11/15/23 05:11 |
| **60442112003** | **S-DG-1** | Water | 11/13/23 10:35 | 11/15/23 05:11 |
| **60442112004** | **S-DG-2** | Water | 11/13/23 11:20 | 11/15/23 05:11 |
| **60442112005** | **S-DG-3** | Water | 11/13/23 12:07 | 11/15/23 05:11 |
| **60442112006** | **S-DG-4** | Water | 11/13/23 13:00 | 11/15/23 05:11 |
| **60442112007** | **S-SCPC-DUP-1** | Water | 11/13/23 08:00 | 11/15/23 05:11 |
| **60442112008** | **S-SCPC-FB-1** | Water | 11/13/23 10:28 | 11/15/23 05:11 |
| **60442112002** | **S-UG-2** | Water | 11/13/23 10:53 | 11/15/23 05:11 |
| **60441897001** | **S-BMW-1S** | Water | 11/10/23 09:57 | 11/11/23 04:50 |
| **60441897002** | **S-BMW-3S** | Water | 11/10/23 09:18 | 11/11/23 04:50 |

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

## SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60442112

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| **60442112001** | **S-UG-1A** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112003** | **S-DG-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112004** | **S-DG-2** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112005** | **S-DG-3** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112006** | **S-DG-4** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112007** | **S-SCPC-DUP-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112008** | **S-SCPC-FB-1** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60442112002** | **S-UG-2** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60441897001** | **S-BMW-1S** | EPA 200.7 | JXD | 7 | PASI-K |
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |
| **60441897002** | **S-BMW-3S** | EPA 200.7 | JXD | 7 | PASI-K |

## REPORT OF LABORATORY ANALYSIS

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## SAMPLE ANALYTE COUNT

Project: AMEREN SCPC
Pace Project No.: 60442112

| Lab ID | Sample ID | Method | Analysts | Analytes Reported | Laboratory |
|---|---|---|---|---|---|
| | | SM 2320B | BMT | 1 | PASI-K |
| | | SM 2540C | ZVF | 1 | PASI-K |
| | | EPA 300.0 | RKA | 3 | PASI-K |

PASI-K = Pace Analytical Services - Kansas City

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-UG-1A** **Lab ID: 60442112001** Collected: 11/13/23 09:45 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **165** | ug/L | 100 | 6.4 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7440-42-8 | |
| Calcium | **157000** | ug/L | 200 | 26.9 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7440-70-2 | M1 |
| Iron | **11.0J** | ug/L | 50.0 | 9.1 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7439-89-6 | |
| Magnesium | **36400** | ug/L | 50.0 | 20.1 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7439-95-4 | M1 |
| Manganese | **355** | ug/L | 5.0 | 0.39 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7439-96-5 | |
| Potassium | **10700** | ug/L | 500 | 69.7 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7440-09-7 | |
| Sodium | **43300** | ug/L | 500 | 115 | 1 | 11/30/23 10:05 | 12/06/23 10:19 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **428** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:04 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **672** | mg/L | 13.3 | 13.3 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **74.8** | mg/L | 10.0 | 5.3 | 10 | | 12/12/23 15:18 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 14:10 | 16984-48-8 | H1,L1 |
| Sulfate | **52.7** | mg/L | 10.0 | 5.5 | 10 | | 12/12/23 15:18 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-DG-1** **Lab ID: 60442112003** Collected: 11/13/23 10:35 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **107** | ug/L | 100 | 6.4 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7440-42-8 | |
| Calcium | **138000** | ug/L | 200 | 26.9 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7440-70-2 | |
| Iron | **263** | ug/L | 50.0 | 9.1 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7439-89-6 | |
| Magnesium | **32900** | ug/L | 50.0 | 20.1 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7439-95-4 | |
| Manganese | **152** | ug/L | 5.0 | 0.39 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7439-96-5 | |
| Potassium | **4100** | ug/L | 500 | 69.7 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7440-09-7 | |
| Sodium | **4630** | ug/L | 500 | 115 | 1 | 11/30/23 10:05 | 12/06/23 10:27 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **444** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:23 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **549** | mg/L | 10.0 | 10.0 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **2.5** | mg/L | 1.0 | 0.53 | 1 | | 12/12/23 16:27 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 16:27 | 16984-48-8 | H1,L1 |
| Sulfate | **19.4** | mg/L | 1.0 | 0.55 | 1 | | 12/12/23 16:27 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-DG-2** **Lab ID: 60442112004** Collected: 11/13/23 11:20 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **82.0J** | ug/L | 100 | 6.4 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7440-42-8 | |
| Calcium | **133000** | ug/L | 200 | 26.9 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7440-70-2 | M1 |
| Iron | **278** | ug/L | 50.0 | 9.1 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7439-89-6 | |
| Magnesium | **27800** | ug/L | 50.0 | 20.1 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7439-95-4 | |
| Manganese | **484** | ug/L | 5.0 | 0.39 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7439-96-5 | |
| Potassium | **6670** | ug/L | 500 | 69.7 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7440-09-7 | |
| Sodium | **4300** | ug/L | 500 | 115 | 1 | 11/30/23 10:05 | 12/06/23 10:29 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **406** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:30 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **505** | mg/L | 10.0 | 10.0 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **2.3** | mg/L | 1.0 | 0.53 | 1 | | 12/12/23 16:49 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 16:49 | 16984-48-8 | H1,L1 |
| Sulfate | **35.2** | mg/L | 10.0 | 5.5 | 10 | | 12/12/23 17:26 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-DG-3** **Lab ID: 60442112005** Collected: 11/13/23 12:07 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **81.9J** | ug/L | 100 | 6.4 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7440-42-8 | |
| Calcium | **160000** | ug/L | 200 | 26.9 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7440-70-2 | |
| Iron | **94.6** | ug/L | 50.0 | 9.1 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7439-89-6 | |
| Magnesium | **33300** | ug/L | 50.0 | 20.1 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7439-95-4 | |
| Manganese | **940** | ug/L | 5.0 | 0.39 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7439-96-5 | |
| Potassium | **5070** | ug/L | 500 | 69.7 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7440-09-7 | |
| Sodium | **4900** | ug/L | 500 | 115 | 1 | 11/30/23 10:05 | 12/06/23 10:33 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **463** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:36 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **594** | mg/L | 10.0 | 10.0 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **8.2** | mg/L | 1.0 | 0.53 | 1 | | 12/13/23 14:29 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/13/23 14:29 | 16984-48-8 | H1,L1 |
| Sulfate | **65.1** | mg/L | 5.0 | 2.8 | 5 | | 12/12/23 17:36 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-DG-4** **Lab ID: 60442112006** Collected: 11/13/23 13:00 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **105** | ug/L | 100 | 6.4 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7440-42-8 | |
| Calcium | **154000** | ug/L | 200 | 26.9 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7440-70-2 | |
| Iron | **14.7J** | ug/L | 50.0 | 9.1 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7439-89-6 | |
| Magnesium | **47800** | ug/L | 50.0 | 20.1 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7439-95-4 | |
| Manganese | **1070** | ug/L | 5.0 | 0.39 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7439-96-5 | |
| Potassium | **6690** | ug/L | 500 | 69.7 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7440-09-7 | |
| Sodium | **8870** | ug/L | 500 | 115 | 1 | 12/04/23 11:18 | 12/06/23 09:33 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **521** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:54 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **732** | mg/L | 13.3 | 13.3 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **12.4** | mg/L | 1.0 | 0.53 | 1 | | 12/12/23 17:59 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 17:59 | 16984-48-8 | H1,L1 |
| Sulfate | **63.3** | mg/L | 10.0 | 5.5 | 10 | | 12/12/23 18:10 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-SCPC-DUP-1** **Lab ID: 60442112007** Collected: 11/13/23 08:00 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **75.9J** | ug/L | 100 | 6.4 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7440-42-8 | |
| Calcium | **120000** | ug/L | 200 | 26.9 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7440-70-2 | M1 |
| Iron | **243** | ug/L | 50.0 | 9.1 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7439-89-6 | |
| Magnesium | **25100** | ug/L | 50.0 | 20.1 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7439-95-4 | M1 |
| Manganese | **433** | ug/L | 5.0 | 0.39 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7439-96-5 | M1 |
| Potassium | **6150** | ug/L | 500 | 69.7 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7440-09-7 | |
| Sodium | **3840** | ug/L | 500 | 115 | 1 | 12/04/23 11:18 | 12/06/23 09:39 | 7440-23-5 | M1 |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **395** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 22:01 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **468** | mg/L | 10.0 | 10.0 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **2.3** | mg/L | 1.0 | 0.53 | 1 | | 12/12/23 18:22 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 18:22 | 16984-48-8 | H1,L1 |
| Sulfate | **32.1** | mg/L | 10.0 | 5.5 | 10 | | 12/12/23 18:33 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-SCPC-FB-1** **Lab ID: 60442112008** Collected: 11/13/23 10:28 Received: 11/15/23 05:11 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 | 12/04/23 11:18 | 12/06/23 09:41 | 7440-42-8 | |
| Calcium | **<26.9** | ug/L | 200 | 26.9 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7439-89-6 | |
| Magnesium | **<20.1** | ug/L | 50.0 | 20.1 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7439-95-4 | |
| Manganese | **0.55J** | ug/L | 5.0 | 0.39 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7439-96-5 | |
| Potassium | **<69.7** | ug/L | 500 | 69.7 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7440-09-7 | |
| Sodium | **<115** | ug/L | 500 | 115 | 1 | 12/04/23 11:18 | 12/06/23 09:41 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **<10.5** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 22:07 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C | | | | | | | | |
| | Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **<5.0** | mg/L | 5.0 | 5.0 | 1 | | 11/20/23 13:16 | | |
| **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 | | 12/12/23 18:45 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 18:45 | 16984-48-8 | H1,L1 |
| Sulfate | **<0.55** | mg/L | 1.0 | 0.55 | 1 | | 12/12/23 18:45 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-UG-2** **Lab ID: 60442112002** Collected: 11/13/23 10:53 Received: 11/15/23 05:11 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **1700** | ug/L | 100 | 6.4 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7440-42-8 | |
| Calcium | **119000** | ug/L | 200 | 26.9 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7440-70-2 | |
| Iron | **<9.1** | ug/L | 50.0 | 9.1 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7439-89-6 | |
| Magnesium | **24300** | ug/L | 50.0 | 20.1 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7439-95-4 | |
| Manganese | **160** | ug/L | 5.0 | 0.39 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7439-96-5 | |
| Potassium | **3710** | ug/L | 500 | 69.7 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7440-09-7 | |
| Sodium | **14900** | ug/L | 500 | 115 | 1 | 11/30/23 10:05 | 12/06/23 10:25 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **309** | mg/L | 20.0 | 10.5 | 1 | | 11/22/23 21:17 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **483** | mg/L | 10.0 | 10.0 | 1 | | 11/20/23 13:15 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **12.9** | mg/L | 1.0 | 0.53 | 1 | | 12/12/23 16:04 | 16887-00-6 | H1 |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/12/23 16:04 | 16984-48-8 | H1,L1 |
| Sulfate | **0.79J** | mg/L | 1.0 | 0.55 | 1 | | 12/12/23 16:04 | 14808-79-8 | H1 |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-BMW-1S** **Lab ID: 60441897001** Collected: 11/10/23 09:57 Received: 11/11/23 04:50 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **57.9J** | ug/L | 100 | 6.4 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7440-42-8 | |
| Calcium | **136000** | ug/L | 200 | 26.9 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7440-70-2 | |
| Iron | **57.0** | ug/L | 50.0 | 9.1 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7439-89-6 | |
| Magnesium | **26600** | ug/L | 50.0 | 20.1 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7439-95-4 | |
| Manganese | **489** | ug/L | 5.0 | 0.39 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7439-96-5 | |
| Potassium | **633** | ug/L | 500 | 69.7 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7440-09-7 | |
| Sodium | **5970** | ug/L | 500 | 115 | 1 | 11/28/23 12:31 | 11/29/23 10:15 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **427** | mg/L | 20.0 | 10.5 | 1 | | 11/21/23 20:50 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **475** | mg/L | 10.0 | 10.0 | 1 | | 11/17/23 14:43 | | |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **7.2** | mg/L | 1.0 | 0.53 | 1 | | 12/07/23 13:26 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/07/23 13:26 | 16984-48-8 | L1 |
| Sulfate | **46.9** | mg/L | 5.0 | 2.8 | 5 | | 12/08/23 21:55 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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# ANALYTICAL RESULTS

Project: AMEREN SCPC
Pace Project No.: 60442112

**Sample: S-BMW-3S** **Lab ID: 60441897002** Collected: 11/10/23 09:18 Received: 11/11/23 04:50 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<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Boron | **58.9J** | ug/L | 100 | 6.4 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7440-42-8 | |
| Calcium | **114000** | ug/L | 200 | 26.9 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7440-70-2 | |
| Iron | **58.0** | ug/L | 50.0 | 9.1 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7439-89-6 | |
| Magnesium | **20700** | ug/L | 50.0 | 20.1 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7439-95-4 | |
| Manganese | **211** | ug/L | 5.0 | 0.39 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7439-96-5 | |
| Potassium | **717** | ug/L | 500 | 69.7 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7440-09-7 | |
| Sodium | **5960** | ug/L | 500 | 115 | 1 | 11/28/23 12:31 | 11/29/23 10:17 | 7440-23-5 | |
| **2320B Alkalinity** | Analytical Method: SM 2320B<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Alkalinity, Total as CaCO3 | **357** | mg/L | 20.0 | 10.5 | 1 | | 11/21/23 20:55 | | |
| **2540C Total Dissolved Solids** | Analytical Method: SM 2540C<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Total Dissolved Solids | **398** | mg/L | 10.0 | 10.0 | 1 | | 11/17/23 14:43 | | 1e |
| **300.0 IC Anions 28 Days** | Analytical Method: EPA 300.0<br>Pace Analytical Services - Kansas City | | | | | | | | |
| Chloride | **13.4** | mg/L | 1.0 | 0.53 | 1 | | 12/07/23 13:49 | 16887-00-6 | |
| Fluoride | **<0.12** | mg/L | 0.20 | 0.12 | 1 | | 12/07/23 13:49 | 16984-48-8 | L1 |
| Sulfate | **12.3** | mg/L | 1.0 | 0.55 | 1 | | 12/07/23 13:49 | 14808-79-8 | |

## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 874935
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3465241 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 11/29/23 10:04 | |
| Calcium | ug/L | <26.9 | 200 | 26.9 | 11/29/23 10:04 | |
| Iron | ug/L | <9.1 | 50.0 | 9.1 | 11/29/23 10:04 | |
| Magnesium | ug/L | <20.1 | 50.0 | 20.1 | 11/29/23 10:04 | |
| Manganese | ug/L | <0.39 | 5.0 | 0.39 | 11/29/23 10:04 | |
| Potassium | ug/L | <69.7 | 500 | 69.7 | 11/29/23 10:04 | |
| Sodium | ug/L | <115 | 500 | 115 | 11/29/23 10:04 | |

LABORATORY CONTROL SAMPLE: 3465242

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | 1000 | 935 | 94 | 85-115 | |
| Calcium | ug/L | 10000 | 9590 | 96 | 85-115 | |
| Iron | ug/L | 10000 | 9850 | 98 | 85-115 | |
| Magnesium | ug/L | 10000 | 9550 | 95 | 85-115 | |
| Manganese | ug/L | 1000 | 1000 | 100 | 85-115 | |
| Potassium | ug/L | 10000 | 9440 | 94 | 85-115 | |
| Sodium | ug/L | 10000 | 9780 | 98 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3465243 3465244

| Parameter | Units | 60442540001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 420 | 1000 | 1000 | 1370 | 1320 | 95 | 90 | 70-130 | 4 | 20 | |
| Calcium | ug/L | 33500 | 10000 | 10000 | 43100 | 41500 | 96 | 79 | 70-130 | 4 | 20 | |
| Iron | ug/L | 992 | 10000 | 10000 | 10800 | 10400 | 98 | 94 | 70-130 | 4 | 20 | |
| Magnesium | ug/L | 10500 | 10000 | 10000 | 20000 | 19300 | 95 | 88 | 70-130 | 4 | 20 | |
| Manganese | ug/L | 395 | 1000 | 1000 | 1360 | 1310 | 96 | 92 | 70-130 | 3 | 20 | |
| Potassium | ug/L | 18900 | 10000 | 10000 | 30300 | 29400 | 115 | 105 | 70-130 | 3 | 20 | |
| Sodium | ug/L | 1780000 | 10000 | 10000 | 1810000 | 1730000 | 259 | -572 | 70-130 | 5 | 20 | E,M1 |

MATRIX SPIKE SAMPLE: 3465245

| Parameter | Units | 60442296002 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Boron | ug/L | 290 | 1000 | 1240 | 95 | 70-130 | |
| Calcium | ug/L | 104000 | 10000 | 112000 | 83 | 70-130 | |

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

MATRIX SPIKE SAMPLE: 3465245

| Parameter | Units | 60442296002 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Iron | ug/L | 270 | 10000 | 10100 | 98 | 70-130 | |
| Magnesium | ug/L | 52900 | 10000 | 62400 | 95 | 70-130 | |
| Manganese | ug/L | 73.5 | 1000 | 1070 | 100 | 70-130 | |
| Potassium | ug/L | 86000 | 10000 | 94800 | 88 | 70-130 | |
| Sodium | ug/L | 212000 | 10000 | 219000 | 67 | 70-130 | M1 |

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# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 875218
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005

METHOD BLANK: 3466217 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 12/06/23 09:53 | |
| Calcium | ug/L | <26.9 | 200 | 26.9 | 12/06/23 09:53 | |
| Iron | ug/L | <9.1 | 50.0 | 9.1 | 12/06/23 09:53 | |
| Magnesium | ug/L | <20.1 | 50.0 | 20.1 | 12/06/23 09:53 | |
| Manganese | ug/L | <0.39 | 5.0 | 0.39 | 12/06/23 09:53 | |
| Potassium | ug/L | <69.7 | 500 | 69.7 | 12/06/23 09:53 | |
| Sodium | ug/L | <115 | 500 | 115 | 12/06/23 09:53 | |

LABORATORY CONTROL SAMPLE: 3466218

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | 1000 | 945 | 94 | 85-115 | |
| Calcium | ug/L | 10000 | 9670 | 97 | 85-115 | |
| Iron | ug/L | 10000 | 9780 | 98 | 85-115 | |
| Magnesium | ug/L | 10000 | 9480 | 95 | 85-115 | |
| Manganese | ug/L | 1000 | 1020 | 102 | 85-115 | |
| Potassium | ug/L | 10000 | 9300 | 93 | 85-115 | |
| Sodium | ug/L | 10000 | 9990 | 100 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466219 3466220

| Parameter | Units | 60442105001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 93.7J | 1000 | 1000 | 1040 | 1040 | 95 | 94 | 70-130 | 0 | 20 | |
| Calcium | ug/L | 117000 | 10000 | 10000 | 120000 | 122000 | 30 | 45 | 70-130 | 1 | 20 | M1 |
| Iron | ug/L | <9.1 | 10000 | 10000 | 9720 | 9850 | 97 | 98 | 70-130 | 1 | 20 | |
| Magnesium | ug/L | 30400 | 10000 | 10000 | 38400 | 38700 | 80 | 83 | 70-130 | 1 | 20 | |
| Manganese | ug/L | 695 | 1000 | 1000 | 1660 | 1690 | 96 | 99 | 70-130 | 2 | 20 | |
| Potassium | ug/L | 5880 | 10000 | 10000 | 15300 | 15400 | 95 | 95 | 70-130 | 0 | 20 | |
| Sodium | ug/L | 4970 | 10000 | 10000 | 14900 | 15000 | 99 | 100 | 70-130 | 1 | 20 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466221 3466222

| Parameter | Units | 60442112001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 165 | 1000 | 1000 | 1160 | 1110 | 99 | 94 | 70-130 | 5 | 20 | |

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3466221 3466222

| Parameter | Units | 60442112001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | ug/L | 157000 | 10000 | 10000 | 165000 | 155000 | 81 | -24 | 70-130 | 7 | 20 | M1 |
| Iron | ug/L | 11.0J | 10000 | 10000 | 10200 | 9820 | 102 | 98 | 70-130 | 4 | 20 | |
| Magnesium | ug/L | 36400 | 10000 | 10000 | 46200 | 43200 | 99 | 68 | 70-130 | 7 | 20 | M1 |
| Manganese | ug/L | 355 | 1000 | 1000 | 1400 | 1340 | 104 | 98 | 70-130 | 5 | 20 | |
| Potassium | ug/L | 10700 | 10000 | 10000 | 20900 | 19900 | 103 | 93 | 70-130 | 5 | 20 | |
| Sodium | ug/L | 43300 | 10000 | 10000 | 53600 | 50600 | 103 | 72 | 70-130 | 6 | 20 | |

MATRIX SPIKE SAMPLE: 3466223

| Parameter | Units | 60442112004 Result | Spike Conc. | MS Result | MS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|---|
| Boron | ug/L | 82.0J | 1000 | 1050 | 97 | 70-130 | |
| Calcium | ug/L | 133000 | 10000 | 137000 | 47 | 70-130 | M1 |
| Iron | ug/L | 278 | 10000 | 10400 | 101 | 70-130 | |
| Magnesium | ug/L | 27800 | 10000 | 36500 | 87 | 70-130 | |
| Manganese | ug/L | 484 | 1000 | 1510 | 102 | 70-130 | |
| Potassium | ug/L | 6670 | 10000 | 16500 | 98 | 70-130 | |
| Sodium | ug/L | 4300 | 10000 | 14600 | 103 | 70-130 | |

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## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 875578
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442112006, 60442112007, 60442112008

METHOD BLANK: 3467639 Matrix: Water
Associated Lab Samples: 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | <6.4 | 100 | 6.4 | 12/06/23 09:29 | |
| Calcium | ug/L | <26.9 | 200 | 26.9 | 12/06/23 09:29 | |
| Iron | ug/L | <9.1 | 50.0 | 9.1 | 12/06/23 09:29 | |
| Magnesium | ug/L | <20.1 | 50.0 | 20.1 | 12/06/23 09:29 | |
| Manganese | ug/L | <0.39 | 5.0 | 0.39 | 12/06/23 09:29 | |
| Potassium | ug/L | <69.7 | 500 | 69.7 | 12/06/23 09:29 | |
| Sodium | ug/L | <115 | 500 | 115 | 12/06/23 09:29 | |

LABORATORY CONTROL SAMPLE: 3467640

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Boron | ug/L | 1000 | 971 | 97 | 85-115 | |
| Calcium | ug/L | 10000 | 9990 | 100 | 85-115 | |
| Iron | ug/L | 10000 | 10300 | 103 | 85-115 | |
| Magnesium | ug/L | 10000 | 9890 | 99 | 85-115 | |
| Manganese | ug/L | 1000 | 1050 | 105 | 85-115 | |
| Potassium | ug/L | 10000 | 9470 | 95 | 85-115 | |
| Sodium | ug/L | 10000 | 10200 | 102 | 85-115 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3467641 3467642

| Parameter | Units | 60442112007 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boron | ug/L | 75.9J | 1000 | 1000 | 1060 | 1030 | 99 | 96 | 70-130 | 3 | 20 | |
| Calcium | ug/L | 120000 | 10000 | 10000 | 163000 | 155000 | 431 | 353 | 70-130 | 5 | 20 | M1 |
| Iron | ug/L | 243 | 10000 | 10000 | 9930 | 9640 | 97 | 94 | 70-130 | 3 | 20 | |
| Magnesium | ug/L | 25100 | 10000 | 10000 | 57800 | 55200 | 327 | 302 | 70-130 | 5 | 20 | M1 |
| Manganese | ug/L | 433 | 1000 | 1000 | 2070 | 2000 | 163 | 157 | 70-130 | 3 | 20 | M1 |
| Potassium | ug/L | 6150 | 10000 | 10000 | 16500 | 16000 | 103 | 99 | 70-130 | 3 | 20 | |
| Sodium | ug/L | 3840 | 10000 | 10000 | 19000 | 18400 | 151 | 146 | 70-130 | 3 | 20 | M1 |

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 874278
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3462786 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | <10.5 | 20.0 | 10.5 | 11/21/23 19:16 | |

LABORATORY CONTROL SAMPLE: 3462787

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

SAMPLE DUPLICATE: 3462788

| Parameter | Units | 60441589019 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 475 | 483 | 2 | 10 | |

SAMPLE DUPLICATE: 3462789

| Parameter | Units | 60441862007 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 232 | 240 | 3 | 10 | |

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## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 874537
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

METHOD BLANK: 3463835 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | <10.5 | 20.0 | 10.5 | 11/22/23 19:52 | |

LABORATORY CONTROL SAMPLE: 3463836

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

SAMPLE DUPLICATE: 3463837

| Parameter | Units | 60442101001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 576 | 573 | 0 | 10 | |

SAMPLE DUPLICATE: 3463838

| Parameter | Units | 60442105001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 363 | 363 | 0 | 10 | |

SAMPLE DUPLICATE: 3463839

| Parameter | Units | 60442112001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 428 | 432 | 1 | 10 | |

SAMPLE DUPLICATE: 3463840

| Parameter | Units | 60441897015 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Alkalinity, Total as CaCO3 | mg/L | 470 | 471 | 0 | 10 | |

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## REPORT OF LABORATORY ANALYSIS

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## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 873904
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3461231 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 11/17/23 14:43 | |

LABORATORY CONTROL SAMPLE: 3461232

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 998 | 100 | 80-120 | |

SAMPLE DUPLICATE: 3461233

| Parameter | Units | 60441897001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 475 | 462 | 3 | 10 | |

SAMPLE DUPLICATE: 3461753

| Parameter | Units | 60441898004 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 345 | 366 | 6 | 10 | |

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## REPORT OF LABORATORY ANALYSIS

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# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 874090
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

METHOD BLANK: 3462073 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | <5.0 | 5.0 | 5.0 | 11/20/23 13:12 | |

LABORATORY CONTROL SAMPLE: 3462074

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 1000 | 986 | 99 | 80-120 | |

SAMPLE DUPLICATE: 3462244

| Parameter | Units | 60442101001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 751 | 727 | 3 | 10 | |

SAMPLE DUPLICATE: 3462245

| Parameter | Units | 60442105001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 451 | 471 | 4 | 10 | |

SAMPLE DUPLICATE: 3462246

| Parameter | Units | 60442112001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Total Dissolved Solids | mg/L | 672 | 643 | 4 | 10 | |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 875885
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60441897001, 60441897002

METHOD BLANK: 3469019 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 12/07/23 13:03 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 12/07/23 13:03 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 12/07/23 13:03 | |

METHOD BLANK: 3471852 Matrix: Water
Associated Lab Samples: 60441897001, 60441897002

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 12/08/23 21:31 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 12/08/23 21:31 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 12/08/23 21:31 | |

LABORATORY CONTROL SAMPLE: 3469020

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 4.5 | 90 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.6 | 103 | 90-110 | |
| Sulfate | mg/L | 5 | 4.5 | 91 | 90-110 | |

LABORATORY CONTROL SAMPLE: 3471853

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 4.9 | 97 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.8 | 113 | 90-110 | L1 |
| Sulfate | mg/L | 5 | 4.8 | 97 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3469021 3469022

| Parameter | Units | 60441898004 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 23.8 | 25 | 25 | 48.4 | 48.2 | 99 | 98 | 80-120 | 0 | 15 | H1 |
| Fluoride | mg/L | 0.15J | 2.5 | 2.5 | 3.1 | 3.2 | 119 | 122 | 80-120 | 2 | 15 | M1 |
| Sulfate | mg/L | 1.9 | 5 | 5 | 6.9 | 7.2 | 100 | 106 | 80-120 | 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.**

## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

SAMPLE DUPLICATE: 3469023

| Parameter | Units | 60441898004 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 23.8 | 23.0 | 3 | 15 | H1 |
| Fluoride | mg/L | 0.15J | 0.15J | | 15 | |
| Sulfate | mg/L | 1.9 | 1.7 | 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

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

QC Batch: 876463
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

METHOD BLANK: 3471507 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 12/11/23 21:27 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 12/11/23 21:27 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 12/11/23 21:27 | |

METHOD BLANK: 3474186 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 12/13/23 13:43 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 12/13/23 13:43 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 12/13/23 13:43 | |

METHOD BLANK: 3474189 Matrix: Water
Associated Lab Samples: 60442112001, 60442112002, 60442112003, 60442112004, 60442112005, 60442112006, 60442112007, 60442112008

| Parameter | Units | Blank Result | Reporting Limit | MDL | Analyzed | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | <0.53 | 1.0 | 0.53 | 12/12/23 08:56 | |
| Fluoride | mg/L | <0.12 | 0.20 | 0.12 | 12/12/23 08:56 | |
| Sulfate | mg/L | <0.55 | 1.0 | 0.55 | 12/12/23 08:56 | |

LABORATORY CONTROL SAMPLE: 3471508

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 5.0 | 100 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.7 | 107 | 90-110 | |
| Sulfate | mg/L | 5 | 4.8 | 96 | 90-110 | |

LABORATORY CONTROL SAMPLE: 3474187

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

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

LABORATORY CONTROL SAMPLE: 3474187

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | 2.5 | 2.8 | 113 | 90-110 | L1 |
| Sulfate | mg/L | 5 | 4.9 | 98 | 90-110 | |

LABORATORY CONTROL SAMPLE: 3474190

| Parameter | Units | Spike Conc. | LCS Result | LCS % Rec | % Rec Limits | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5 | 5.0 | 101 | 90-110 | |
| Fluoride | mg/L | 2.5 | 2.5 | 99 | 90-110 | |
| Sulfate | mg/L | 5 | 5.5 | 109 | 90-110 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471509 3471510

| Parameter | Units | 60442093002 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 5.8 | 5 | 5 | 11.1 | 11.1 | 106 | 107 | 80-120 | 0 | 15 | |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.8 | 2.8 | 111 | 113 | 80-120 | 2 | 15 | |
| Sulfate | mg/L | 28.8 | 50 | 50 | 78.7 | 81.7 | 100 | 106 | 80-120 | 4 | 15 | |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471512 3471513

| Parameter | Units | 60442105001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 2.0 | 5 | 5 | 6.0 | 6.1 | 81 | 82 | 80-120 | 1 | 15 | H1 |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.8 | 2.9 | 113 | 114 | 80-120 | 1 | 15 | H1 |
| Sulfate | mg/L | 44.3 | 50 | 50 | 97.9 | 136 | 107 | 183 | 80-120 | 33 | 15 | H1,M1, R1 |

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3471515 3471516

| Parameter | Units | 60442112001 Result | MS Spike Conc. | MSD Spike Conc. | MS Result | MSD Result | MS % Rec | MSD % Rec | % Rec Limits | RPD | Max RPD | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | mg/L | 74.8 | 50 | 50 | 120 | 122 | 91 | 95 | 80-120 | 2 | 15 | H1 |
| Fluoride | mg/L | <0.12 | 2.5 | 2.5 | 2.8 | 2.7 | 112 | 107 | 80-120 | 5 | 15 | H1 |
| Sulfate | mg/L | 52.7 | 50 | 50 | 97.0 | 102 | 89 | 99 | 80-120 | 5 | 15 | H1 |

SAMPLE DUPLICATE: 3471511

| Parameter | Units | 60442093002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 5.8 | 5.8 | 0 | 15 | |

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## REPORT OF LABORATORY ANALYSIS

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

## QUALITY CONTROL DATA

Project: AMEREN SCPC
Pace Project No.: 60442112

SAMPLE DUPLICATE: 3471511

| Parameter | Units | 60442093002 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | |
| Sulfate | mg/L | 28.8 | 27.5 | 5 | 15 | |

SAMPLE DUPLICATE: 3471514

| Parameter | Units | 60442105001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 2.0 | 2.0 | 2 | 15 | H1 |
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | H1 |
| Sulfate | mg/L | 44.3 | 44.4 | 0 | 15 | H1 |

SAMPLE DUPLICATE: 3471517

| Parameter | Units | 60442112001 Result | Dup Result | RPD | Max RPD | Qualifiers |
|---|---|---|---|---|---|---|
| Chloride | mg/L | 74.8 | 71.4 | 5 | 15 | H1 |
| Fluoride | mg/L | <0.12 | <0.12 | | 15 | H1 |
| Sulfate | mg/L | 52.7 | 47.7 | 10 | 15 | H1 |

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

## REPORT OF LABORATORY ANALYSIS

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

# QUALIFIERS

Project: AMEREN SCPC
Pace Project No.: 60442112

## 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

| | |
|---|---|
| 1e | Achieving a constant weight was not met for this sample. |
| E | Analyte concentration exceeded the calibration range. The reported result is estimated. |
| H1 | Analysis conducted outside the EPA method holding time. |
| L1 | Analyte recovery in the laboratory control sample (LCS) was above QC limits. Results for this analyte in associated samples may be biased high. |
| M1 | Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery. |
| R1 | RPD value was outside control limits. |

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

# QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SCPC
Pace Project No.: 60442112

| Lab ID | Sample ID | QC Batch Method | QC Batch | Analytical Method | Analytical Batch |
|---|---|---|---|---|---|
| **60441897001** | **S-BMW-1S** | EPA 200.7 | 874935 | EPA 200.7 | 874954 |
| **60441897002** | **S-BMW-3S** | EPA 200.7 | 874935 | EPA 200.7 | 874954 |
| **60442112001** | **S-UG-1A** | EPA 200.7 | 875218 | EPA 200.7 | 875320 |
| **60442112002** | **S-UG-2** | EPA 200.7 | 875218 | EPA 200.7 | 875320 |
| **60442112003** | **S-DG-1** | EPA 200.7 | 875218 | EPA 200.7 | 875320 |
| **60442112004** | **S-DG-2** | EPA 200.7 | 875218 | EPA 200.7 | 875320 |
| **60442112005** | **S-DG-3** | EPA 200.7 | 875218 | EPA 200.7 | 875320 |
| **60442112006** | **S-DG-4** | EPA 200.7 | 875578 | EPA 200.7 | 875643 |
| **60442112007** | **S-SCPC-DUP-1** | EPA 200.7 | 875578 | EPA 200.7 | 875643 |
| **60442112008** | **S-SCPC-FB-1** | EPA 200.7 | 875578 | EPA 200.7 | 875643 |
| **60441897001** | **S-BMW-1S** | SM 2320B | 874278 | | |
| **60441897002** | **S-BMW-3S** | SM 2320B | 874278 | | |
| **60442112001** | **S-UG-1A** | SM 2320B | 874537 | | |
| **60442112002** | **S-UG-2** | SM 2320B | 874537 | | |
| **60442112003** | **S-DG-1** | SM 2320B | 874537 | | |
| **60442112004** | **S-DG-2** | SM 2320B | 874537 | | |
| **60442112005** | **S-DG-3** | SM 2320B | 874537 | | |
| **60442112006** | **S-DG-4** | SM 2320B | 874537 | | |
| **60442112007** | **S-SCPC-DUP-1** | SM 2320B | 874537 | | |
| **60442112008** | **S-SCPC-FB-1** | SM 2320B | 874537 | | |
| **60441897001** | **S-BMW-1S** | SM 2540C | 873904 | | |
| **60441897002** | **S-BMW-3S** | SM 2540C | 873904 | | |
| **60442112001** | **S-UG-1A** | SM 2540C | 874090 | | |
| **60442112002** | **S-UG-2** | SM 2540C | 874090 | | |
| **60442112003** | **S-DG-1** | SM 2540C | 874090 | | |
| **60442112004** | **S-DG-2** | SM 2540C | 874090 | | |
| **60442112005** | **S-DG-3** | SM 2540C | 874090 | | |
| **60442112006** | **S-DG-4** | SM 2540C | 874090 | | |
| **60442112007** | **S-SCPC-DUP-1** | SM 2540C | 874090 | | |
| **60442112008** | **S-SCPC-FB-1** | SM 2540C | 874090 | | |
| **60441897001** | **S-BMW-1S** | EPA 300.0 | 875885 | | |
| **60441897002** | **S-BMW-3S** | EPA 300.0 | 875885 | | |
| **60442112001** | **S-UG-1A** | EPA 300.0 | 876463 | | |
| **60442112002** | **S-UG-2** | EPA 300.0 | 876463 | | |
| **60442112003** | **S-DG-1** | EPA 300.0 | 876463 | | |
| **60442112004** | **S-DG-2** | EPA 300.0 | 876463 | | |
| **60442112005** | **S-DG-3** | EPA 300.0 | 876463 | | |
| **60442112006** | **S-DG-4** | EPA 300.0 | 876463 | | |
| **60442112007** | **S-SCPC-DUP-1** | EPA 300.0 | 876463 | | |
| **60442112008** | **S-SCPC-FB-1** | EPA 300.0 | 876463 | | |

WO# : 60442112

60442112

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

Client Name: Rocksmith Geoeng

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

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

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

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

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

**Cooler Temperature (°C):** **As-read** 0.9/1.6 **Corr. Factor** -0.3 **Corrected** 0.6/1.3 1.4/0.8

Temperature should be above freezing to 6°C 1.7/1.1

**Date and initials of person examining contents:** PV 11/15/23

| | | |
|---|---|---|
| Chain of Custody present: | ☑Yes ☐No ☐N/A | |
| Chain of Custody relinquished: | ☑Yes ☐No ☐N/A | |
| Samples arrived within holding time: | ☑Yes ☐No ☐N/A | |
| **Short Hold Time analyses (<72hr):** | ☐Yes ☑No ☐N/A | |
| **Rush Turn Around Time requested:** | ☐Yes ☑No ☐N/A | |
| Sufficient volume: | ☑Yes ☐No ☐N/A | |
| Correct containers used: | ☑Yes ☐No ☐N/A | |
| Pace containers used: | ☑Yes ☐No ☐N/A | |
| Containers intact: | ☑Yes ☐No ☐N/A | |
| Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs? | ☐Yes ☐No ☑N/A | |
| Filtered volume received for dissolved tests? | ☐Yes ☐No ☑N/A | |
| Sample labels match COC: Date / time / ID / analyses | ☑Yes ☐No ☐N/A | |
| Samples contain multiple phases? Matrix: WT | ☐Yes ☑No ☐N/A | |
| Containers requiring pH preservation in compliance? ($HNO_3$, $H_2SO_4$, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) **LOT#:** 67191 | ☑Yes ☐No ☐N/A | List sample IDs, volumes, lot #'s of preservative and the date/time added. |
| Cyanide water sample checks: Lead acetate strip turns dark? (Record only) | ☐Yes ☐No | |
| Potassium iodide test strip turns blue/purple? (Preserve) | ☐Yes ☐No | |
| Trip Blank present: | ☐Yes ☐No ☑N/A | |
| Headspace in VOA vials ( >6mm): | ☐Yes ☐No ☑N/A | |
| Samples from USDA Regulated Area: State: | ☐Yes ☐No ☑N/A | |
| Additional labels attached to 5035A / TX1005 vials in the field? | ☐Yes ☐No ☑N/A | |

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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

# CHAIN-OF-CUSTODY Analytical Request Document

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

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

60442112

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

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

County / State origin of sample(s): Missouri

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

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____

Date Results Requested:

DW PWSID # or WW Permit # as applicable:

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

Analysis:

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

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

Lab Use Only: Proj. Mgr: Jamie Church; AcctNum / Client ID:; Table #:; Profile / Template: 15856, Line 2; Prelog / Bottle Ord. ID: EZ 3011903

Preservation non-conformance identified for sample.

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

| Customer Sample ID | Matrix * | Comp / Grab | Collected (or Composite Start) Date | Collected (or Composite Start) Time | Composite End Date | Composite End Time | Res. Cl2 | Number & Type of Containers: Plastic | Number & Type of Containers: Glass | Chloride/Fluoride/Sulfate | Alkalinity | TDS | App III and Cat/An Metals (200.7)* | Sample Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-UG-1A | WT | G | 11-13-23 | 0945 | | | | 2 | | ✓ | ✓ | ✓ | ✓ | |
| S-UG-2 | WT | | | 1053 | | | | | | | | | | |
| S-DG-1 | WT | | | 1035 | | | | | | | | | | |
| S-DG-2 | WT | | | 1120 | | | | | | | | | | |
| S-DG-3 | WT | | | 1207 | | | | | | | | | | |
| S-DG-4 | WT | | | 1300 | | | | | | | | | | |
| S-SCPC-DUP-1 | WT | | | — | | | | | | | | | | |
| S-SCPC-FB-1 | WT | | | 1028 | | | | | | | | | | |
| S-SCPC-MS-1 | WT | | | 0945 | | | | | | | | | | ~~Collected @ S-TMW-1~~ |
| S-SCPC-MSD-1 | WT | | | 0945 | | | | | | | | | | Collected @ S-UG-1A |

Customer Remarks / Special Conditions / Possible Hazards:
* - App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B

Collected By:
Printed Name: Grant Morey
Signature:

Additional Instructions from Pace®:

| # Coolers: | Thermometer ID: | Correction Factor (°C): | Obs. Temp. (°C) | Corrected Temp. (°C) |
|---|---|---|---|---|
| 4 | T298 | -0.3 | 0.9 / 1.6 / 1.7 | 0.6 / 1.3 / 1.4 |

| | | | | |
|---|---|---|---|---|
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | Tracking Number: 1.1 / 0.8 |
| Grant Morey / Rocksmith | 11-14-23 / 1430 | | 11/15/23 0511 | |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | Delivered by: [ ] In-Person [ ] Courier |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | [ ] FedEx [ ] UPS [ ] Other |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | Page: 1 of 1 |

Client: Rocksmith Boeing

Profile #

Site: Ameren SCPC

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 | | | | | | | | | | | | | | | | | | X3 | | | | X3 | | | | | | | | | |
| 2 | | | | | | | | | | | | | | | | | | | 1X | | | | 2X1 | | | | | | | | | |
| 3 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | 1 | | | | 1 | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Container Codes

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

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

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

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

Work Order Number: 60442112

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

# CHAIN-OF-CUSTODY Analytical Request Document

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

LAB USE ONLY- Affix Workorder/Login Label Here

Scan QR Code for instructions

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

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

County / State origin of sample(s): Missouri

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

Regulatory Program (DW, RCRA, etc.) as applicable:

Rush (Pre-approval required):
[ ] 2 Day [ ] 3 day [ ] 5 day [ ] Other_____
Date Results Requested:

DW PWSID # or WW Permit # as applicable:

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

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

Specify Container Size **

Identify Container Preservative Type***

Analysis Requested

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

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

Lab Use Only
Proj. Mgr: Jamie Church
AcctNum / Client ID:
Table #:
Profile / Template: 15856, Line 2
Prelog / Bottle Ord. ID: EZ 3011903

| Customer Sample ID | Matrix * | Comp / Grab | Collected (or Composite Start) Date | Collected (or Composite Start) Time | Composite End Date | Composite End Time | Res. Cl2 | Number & Type of Containers Plastic | Number & Type of Containers Glass | Chloride/Fluoride/Sulfate | Alkalinity | TDS | App III and Cat/An Metals (200.7)* | Sample Comment | Preservation non-conformance identified for sample. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| S-BMW-1S | WT | G | 11/10/23 | 0957 | | | | 4 | - | ✓ | ✓ | ✓ | ✓ | log under SCPA-CA | |
| S-BMW-3S | WT | G | 11/10/23 | 0918 | | | | 4 | - | ✓ | ✓ | ✓ | ✓ | log under SCPA-CA | |

Customer Remarks / Special Conditions / Possible Hazards:
* - App III and Cat/An Metals* - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B

Collected By:
Printed Name: Grant Mayer
Signature:

Additional Instructions from Pace®:

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

| | | | | |
|---|---|---|---|---|
| Relinquished by/Company: (Signature) Rocksmith | Date/Time: 11-10-23/1550 | Received by/Company: (Signature) | Date/Time: | Tracking Number: |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | Delivered by: [ ] In- Person [ ] Courier |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | [ ] FedEX [ ] UPS [ ] Other |
| Relinquished by/Company: (Signature) | Date/Time: | Received by/Company: (Signature) | Date/Time: | Page: 1 of 1 |

Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace® Terms and Conditions found at https://www.pacelabs.com/resource-library/resource/pace-terms-and-conditions/

ENV-FRM-CORQ-0019_v01_082123 ©

# Memorandum

**January 23, 2024**

| | | | |
|---|---|---|---|
| **To:** | Project File<br>Rocksmith Geoengineering, LLC | **Project Number:** | 23009 |
| **CC:** | Mark Haddock, Jeffrey Ingram | | |
| **From:** | Grant Morey | **Email:** | Grant.Morey@Rocksmithgeo.com |
| **RE:** | **Data Validation Summary, Sioux Energy Center – SCPC – Data Package 60442112** | | |

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

- When a compound was analyzed outside of hold time, the 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 Manager: J. Ingram
Project Name: Ameren SCPC
Project Number: 23009
Reviewer: G. Morey
Validation Date: 1/23/2024

Laboratory: Pace Analytical
SDG #: 60442112
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM 2320B (Alkalinity); SM 2540C (TDS); EPA 300.0 (Anions);
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names S-UG-1A, S-DG-1, S-DG-2, S-DG-3, S-DG-4, S-SCPC-DUP-1, S-SCPC-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? | x | | | 11/10/2023 - 11/13/2023 |
| b) Sampling team indicated? | x | | | GTM/JSI |
| c) Sample location noted? | x | | | |
| d) Sample depth indicated (Soils)? | | | x | |
| e) Sample type indicated (grab/composite)? | x | | | Grab |
| f) Field QC noted? | x | | | See Notes |
| g) Field parameters collected (note types)? | x | | | pH, Spec Cond, Turb, Temp, DO, ORP |
| h) Field Calibration within control limits? | x | | | |
| i) Notations of unacceptable field conditions/performances from field logs or field notes? | | x | | |
| j) Does the laboratory narrative indicate deficiencies? | | | x | No lab narrative. |

Note Deficiencies: _____

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

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

# QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

**Comments/Notes:**

General:

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

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

## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Comments/Notes:**

Field Blanks:

S-SCPC-FB-1 @ S-DG-1: manganese (0.55J). Results > RL and 10x blank, no qualification necessary.

Laboratory Control Samples:

3471853: LCS recovery high for fluoride, associated with samples -001 and -002. Results are non-detects, no qualifications necessary.

3474187: LCS recovery high for fluoride, associated with samples -001 through -008. All results are non-detects, no qualifications necessary.

Duplicates:

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

MS/MSD:

3465243/3465244: MS recovery high, MSD recovery low for sodium. Associated with unrelated sample, no qualification necessary.

3465245: MS recovery low for sodium. Associated with unrelated sample, no qualification necessary.

3466219/3466220: MS/MSD recoveries low for calcium. Associated with unrelated sample, no qualification necessary.

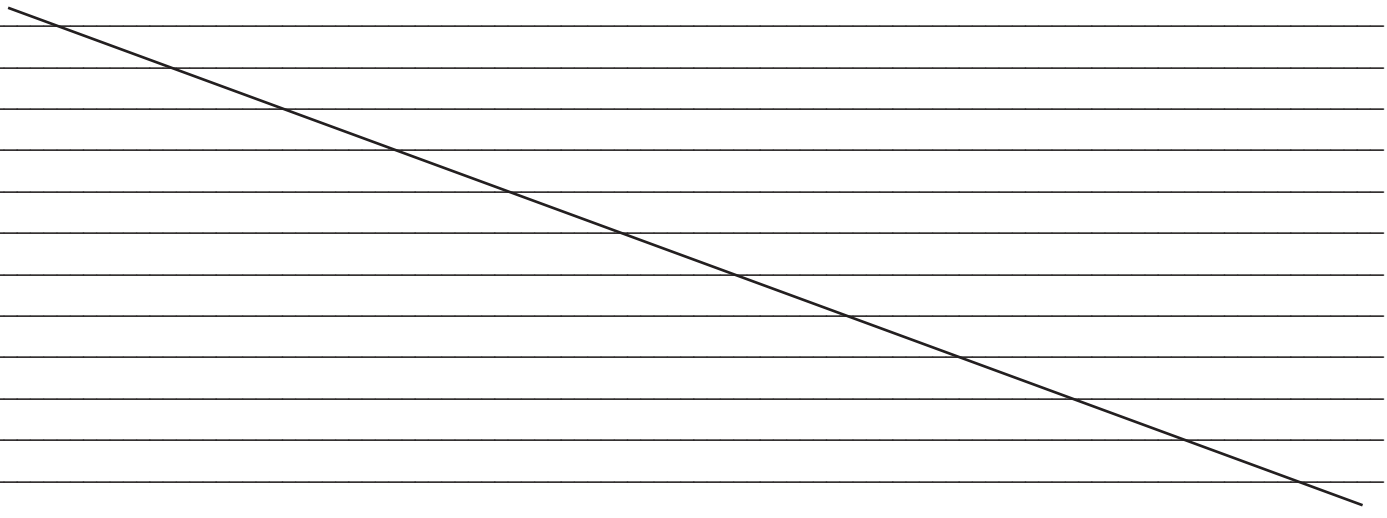
3466221/3466222: MSD recoveries low for calcium and magnesium, MS recoveries and RPD's within control limits, no qualifications necessary.

3466223: MS recovery low for calcium, associated with sample -004. Result qualified as estimate.

3467641/3467642: MS/MSD recoveries high for calcium, magnesium, manganese, and sodium. Associated with sample -007. Results qualified as estimates.

3469021/3469022: MSD recovery high for fluoride, MS and RPD within control limits, no qualification necessary.

3471512/3471513: MSD recovery high for sulfate, RPD exceeds control limit. Associated with unrelated sample, no qualification necessary.



## QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

| Sample Name | Constituent(s) | Result | Qualifier | Reason |
|---|---|---|---|---|
| S-UG-1A | Chloride | 74.8 | J | Analyzed outside of hold time controls |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 52.7 | J | " |
| S-DG-1 | Chloride | 2.5 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 19.4 | J | " |
| S-DG-2 | Chloride | 2.3 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 35.2 | J | " |
| S-DG-3 | Chloride | 8.2 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 65.1 | J | " |
| S-DG-4 | Chloride | 12.4 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 63.3 | J | " |
| S-SCPC-DUP-1 | Chloride | 2.3 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 32.1 | J | " |
| S-SCPC-FB-1 | Chloride | 0.53 | UJ | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 0.55 | UJ | " |
| S-UG-2 | Chloride | 12.9 | J | " |
| " | Fluoride | 0.12 | UJ | " |
| " | Sulfate | 0.79 | J | " |
| S-DG-2 | Calcium | 133,000 | J- | MS recovery low |
| S-SCPC-DUP-1 | " | 120,000 | J+ | MS/MSD recoveries high |
| " | Magnesium | 25,100 | J+ | " |
| " | Manganese | 433 | J+ | " |
| " | Sodium | 3840 | J+ | " |
| | | | | |

Signature: Grant Morey Date: 01/23/2024

# Appendix B

## Alternative Source Demonstration – October 2022 Sampling Event

REPORT

# SCPC – Alternative Source Demonstration

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

**May 19, 2023**

**Submitted to:**

Ameren Missouri
1901 Chouteau Ave, St. Louis, MO 63103

**Submitted by:**

Rocksmith Geoengineering, LLC

# Table of Contents



## TABLES



## FIGURES

# 1.0 CERTIFICATION STATEMENT

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

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

**Rocksmith Geoengineering, LLC.,**


_____

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

Principal Engineer, Senior Partner

# 2.0 INTRODUCTION

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

# 3.0 SITE DESCRIPTION AND BACKGROUND

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

## 3.1 Geological and Hydrogeological Setting

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

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

## 3.2 Utility Waste Landfill – SCPC


UWL Cell 1 is referred to by Ameren as the SCPC, or "Gypsum Pond" Cell 1. The SCPC is approximately 37.5 acres in size and is located south of the generating plant on the south side of Highway 94 (Figure 1). The CCR Unit manages CCR from the SEC Wet Flue-Gas Desulfurization System (WFGD) which began operation in 2010.

The WFGD process occurs after the removal of slag and fly ash where a crushed limestone ($CaCO_3$) mix is introduced into the boiler flue gas flow. The limestone reacts with the sulfur dioxide ($SO_2$) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate ($CaSO_4 * 2H_2O$)). The resultant gypsum material is wet sluiced from the plant across the highway to the SCPC. Once there, the gypsum dewaters by gravity with the sluice conveying water recycled back to the WFGD for reuse. The primary soluble constituents of the gypsum CCR are sulfate, calcium, chloride, and sodium (Gredell and Reitz & Jens, 2014).

The SCPC was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10-7 centimeters per second (cm/sec) overlain by an 80-mil HDPE geomembrane liner. Information on the design of the UWL is available in the 2014 Proposed Construction Permit Modification, Construction Permit Number 0918301 (Gredell and Reitz & Jens, 2014).

A groundwater monitoring well network was installed in 2007 and 2008 in order to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of sixteen (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 state required UWL parameters.

The permit for the SCPC was issued July 30, 2010 (permit #0918301). Nine (9) sampling events were performed prior to July 30, 2010 and represent groundwater quality prior to WFGD placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

## 3.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following were completed prior to the October 17, 2017 deadline: (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and (4) eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the SCPC consists of eight (8) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on Figure 1. Six (6) existing monitoring wells (UG-1A, UG-2, DG-1, DG-2, DG-3, and DG-4) were installed by Gredell Engineering Resources, Inc. in December 2007 and June 2008 as a part of the state UWL state monitoring program. The remaining monitoring wells (BMW-1S and BMW-3S) were installed by Golder in 2016 for CCR Rule groundwater monitoring purposes. More information on the design and installation of the monitoring wells is provided in the SCPC GMP (Golder, 2017) and the SCPC 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight (8) baseline sampling events were completed for the SCPC. After baseline sampling, the first detection monitoring event was completed in November of 2017. The following Appendix III constituents were sampled during detection monitoring:

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

In January 2018, background results from the eight (8) baseline sampling events were used to calculate statistical upper prediction limits (UPLs). These UPLs were then compared to the detection monitoring results from the November 2017 samples and subsequent semi-annual detection monitoring sampling events. If results from the detection monitoring event were higher than the calculated UPL, it was considered to be an initial exceedance, in which case a verification sample was then collected and tested in accordance with the SCPC Statistical Analysis Plan (SAP). In August 2019, the background dataset used to calculate statistical limits was expanded to include the first four detection monitoring events, per the SAP. The updated UPLs were then used for the November 2019 and subsequent detection monitoring events. The following provides a summary of the detection monitoring results to date.

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

In October 2022, 4 initial exceedances were identified for pH and fluoride at UG-1A, TDS at DG-2, and TDS at DG-3. Verification sampling results confirmed only the TDS at DG-3 to be an SSI. Results from this sampling event are provided in **Table 1**.

# 4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

TDS at DG-3 is the only verified SSI from the October 2022 sampling event. Monitoring well DG-3 is screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown in **Figure 1**, DG-3 is located south of the SCPC, south of the generating plant and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

Based on Rocksmith's review of the pre-disposal data (discussed in Section 3.2 above), as well as our comparison of the pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater in some areas around the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC construction and operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program. A summary table of the October 2022 SSI is provided in **Table 2.**

**Table 2: Review of Statistically Significant Increase**

| Constituent | Well ID | UPL Based on Baseline Events | August 2019 Updated UPL | Current UPL (Updated March 2022) | Baseline Sampling Event Range | Range of Values Prior to October 2022 Sampling Event (CCR Rule and State UWL Sampling) | October 2022 Result | January 2023 Results |
|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids (mg/L) | DG-3 | 580 | 624.7 | 592.9 | 528 - 580 | 430 - 624 | 622 | 595 |

Notes:
1) mg/L – milligrams per liter.
2) µg/L – micrograms per liter.
3) UPL – Upper Prediction Limit. UPLs calculated using Sanitas™ software.

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

# 5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

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

- Construction of the SCPC with a 60-mil geomembrane liner and a 2-foot thick clay barrier.
- Lack of elevated key FGD Indicators (sulfate, boron, calcium, fluoride, chloride) in monitoring wells with SSIs.

## 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 | • Boron |

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

Notes:

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

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

### *5.1.1 Evaluation of Key CCR Indicators of FGD Type Wastes*

As indicated on **Table 2**, sulfate, fluoride, calcium, boron, bromide, and chloride are all good indicators of FGD type waste impacts because these constituents typically have a relatively high concentration in the leachate materials when compared with natural groundwater conditions and are typically non-reactive and mobile in most hydrogeological environments (EPRI 2012). As a part of the CCR Rule groundwater monitoring and the state UWL groundwater monitoring, sulfate, fluoride, calcium, boron, and chloride have been tested for since June of 2008. Bromide has not been tested in either the state UWL or CCR Rule monitoring programs.

**Figure 2 – 6** display the full historical set of sulfate, boron, calcium, fluoride and chloride concentrations including the period prior to the receipt of CCR at DG-3. For each of these constituents, current concentrations are at or below those from pre-CCR Placement. This lack of elevated key FGD indicators since the placement of FGD in the SCPC demonstrates that elevated concentrations in DG-3 for TDS are not from the SCPC, but rather an alternative source.

## 5.2 Elevated Total Dissolved Solids (TDS) at DG-3

TDS alone is not a key indicator of CCR or FGD (EPRI 2017, EPRI 2012). As displayed on **Figure 7**, concentrations for the October 2022 and subsequent January 2023 verification sampling event are 622 and 595 mg/L, respectively. These values are just above the original calculated UPL used for TDS concentrations at DG-3 of 580 mg/L and the current UPL of 592.9 mg/L. Furthermore, the values are below the UPL calculated using data through the August 2019 background update of 624.7.

To further investigate the geochemical variability of TDS in the UWL area, the historical data from the state UWL wells (located on the south side of the SCPC, outside of the interpreted zone of impact form the SCPA) were reviewed. These UWL wells (labeled “DG-xx”) were installed and sampled on at least 9 occasions prior to the receipt of FGD in the SCPC. These DG-xx monitoring wells are screened at approximately the same depth as DG-3 in the shallow zone of the alluvial aquifer. **Figure 8** displays a box and whisker plot of the natural variability of the TDS concentrations for the DG-xx wells, which represent groundwater quality from a period that occurred prior to the receipt of FGD in the SCPC. Using all the pre-disposal data from the 12 DG-xx wells, a non-parametric UPL of 678 mg/L is calculated. As displayed in **Figure 8**, the October 2022 and January 2023

sampling results are well within the pre-FGD limits using the monitoring wells near DG-3 and display that the October 2022 and January 2023 results are within the naturally occurring range (290 – 678 mg/L) for the site.

As discussed above, the majority of TDS is made up of calcium, magnesium, sodium, potassium, chloride, sulfate, and alkalinity concentrations. **Table 4** displays the concentration of each of these constituents for semi-annual detection monitoring sampling event since November 2018.

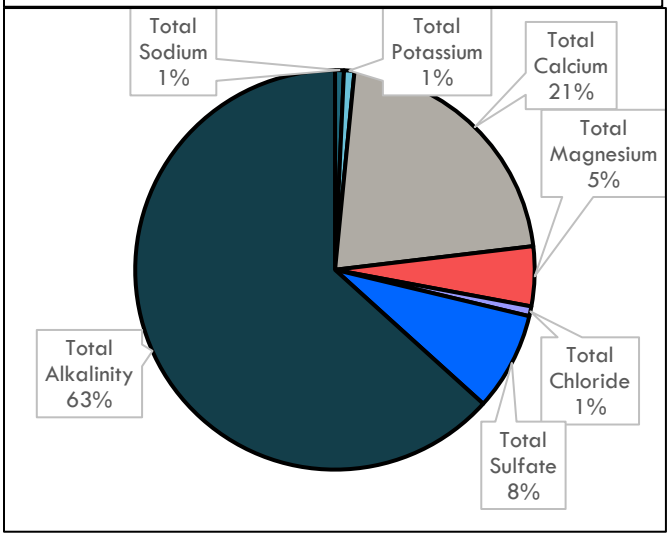
**Table 4 – Total Dissolved Solids Major Constituent Concentrations over Time**

| Sample Date | Total Sodium (mg/L) | Total Potassium (mg/L) | Total Calcium (mg/L) | Total Magnesium (mg/L) | Total Chloride (mg/L) | Total Alkalinity (mg/L) | Total Sulfate (mg/L) |
|---|---|---|---|---|---|---|---|
| 11/13/2018 | 4.42 | 5.12 | 137 | 29.5 | 9.1 | 432 | 64.7 |
| 8/19/2019 | 4.68 | 6.47 | 148 | 39.1 | 4.8 | 450 | 49.5 |
| 11/14/2019 | 4.78 | 6.70 | 144 | 38.1 | 5.4 | 447 | 51.1 |
| 4/28/2020 | 4.60 | 5.22 | 134 | 28.5 | 5.5 | 412 | 52.8 |
| 11/17/2020 | 5.54 | 6.58 | 160 | 38.4 | 3.8 | 451 | 41.0 |
| 4/14/2021 | 4.47 | 5.03 | 143 | 29.1 | 5.9 | 405 | 60.9 |
| 11/10/2021 | 5.18 | 5.76 | 146 | 32.5 | 2.7 | 419 | 46.8 |
| 4/1/2022 | 5.15 | 6.15 | 163 | 28.3 | 8.5 | 460 | 63.9 |
| 10/21/2022 | 5.29 | 6.05 | 162 | 36.8 | 3.3 | 455 | 63.8 |
| **Average Concentration** | **4.90** | **5.90** | **148.6** | **33.4** | **5.44** | **436.8** | **54.9** |
| **October 2022 Ranking** | **2nd** | **5th** | **2nd** | **4th** | **8th** | **2nd** | **3rd** |

Notes:

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

**Figure 9 – Average Percentage of Overall Total Dissolved Solids by Constituent**




Review of **Table 4** displays that current concentrations for each of the major components of TDS are at or below previous sample results since November 2018. Therefore, as displayed in **Table 4** and as discussed in Section 5.1.1 concentrations from the October 2022 sampling event are well within naturally occurring values (pre-FGD placement range) for DG-3. However, as displayed in **Figure 9**, alkalinity, calcium, and sulfate concentrations make up approximately 92% of the total TDS value, for this well on average. In the October 2022 sampling event, the alkalinity result was the 2nd highest of the 9 results, calcium was 2nd highest of the 9 results, and sulfate was 3rd highest of the 9 available results. This indicates that while each individual result is within historical values for that constituent, higher concentrations of alkalinity, sulfate and calcium were reported during the October 2022 sampling event, causing a slightly elevated TDS value when compared to the site UPL. Therefore, the TDS from this October 2022 event was elevated due to naturally occurring high calcium, alkalinity and sulfate values at DG-3 in the pre-FGD placement range of concentrations for the aquifer in this area.

The lack in increasing FGD indicators from prior to CCR placement with those present in the October 2022 sampling event and presence of TDS within the range of nearby wells demonstrates that TDS reported for the

October 2022 sampling event is naturally occurring. The TDS result is within the pre-FGD placement range of concentrations for the aquifer in this area and not caused by impacts originating from the SCPC.

# 6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPC IMPACTS

Based on the information provided in Section 5, the SSI for TDS at DG-3 was not caused by impacts from the SCPC. The SSI appears to be a result of numerous factors including (1) relatively low calculated UPLs that do not account for the natural variability present and (2) naturally occurring higher alkalinity, sulfate and calcium concentrations causing slightly elevated TDS values that have not yet been captured during post-FGD placement sampling at DG-3. Along with these lines of evidence listed above, the SCPC is documented to be constructed with an engineered compacted clay liner which is overlain by a 60-mil HDPE geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts. The SSI for TDS observed in DG-3 is not caused by impacts from the SCPC, but is the result of natural variability within the alluvial aquifer and within the pre-FGD placement range of concentrations for the aquifer in this area.

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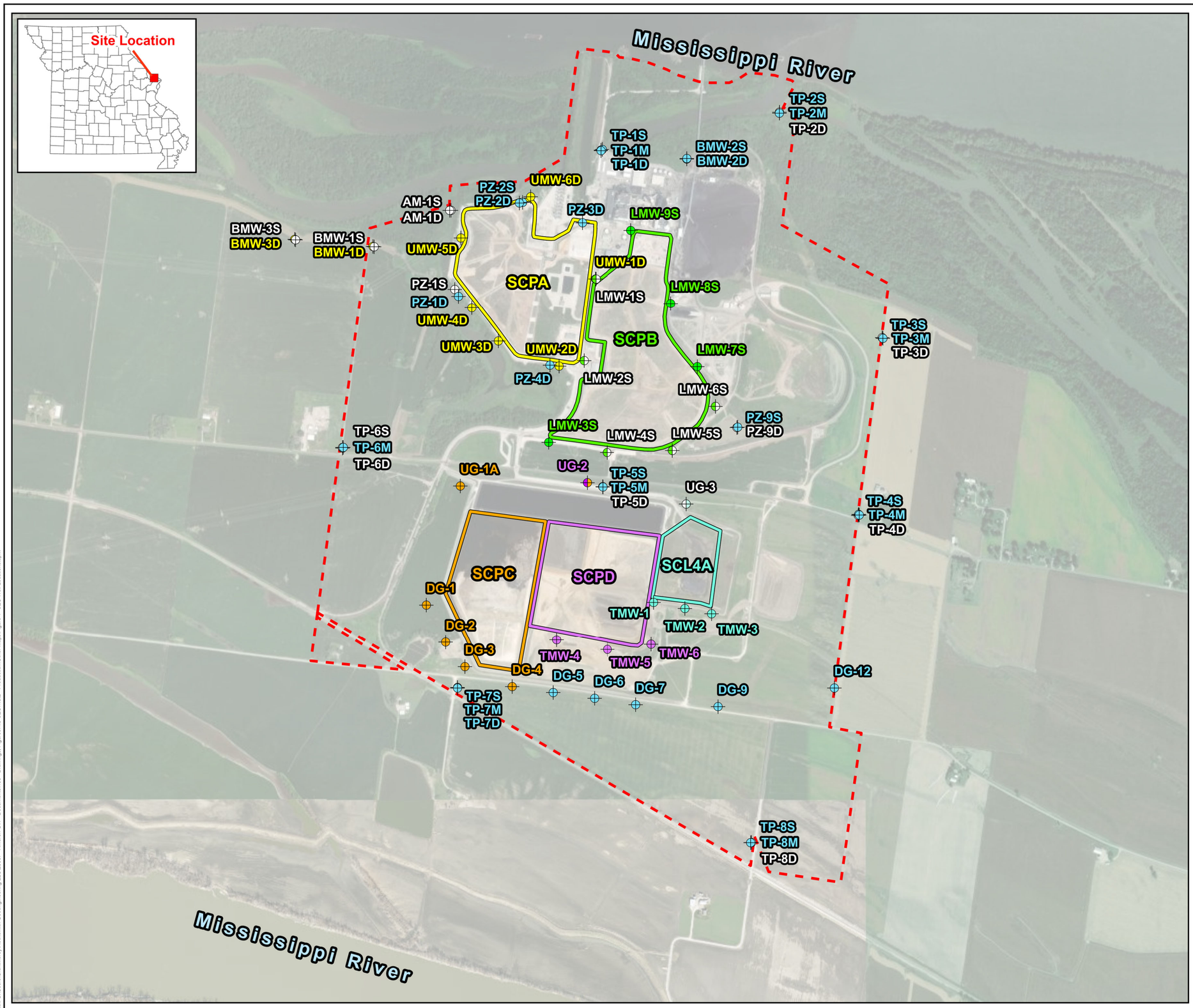
# Tables

# Table 1
# October 2022 Detection Monitoring Results
# SCPC Surface Impoundment
# Sioux Energy Center, St. Charles County, MO

| | | BACKGROUND | | GROUNDWATER MONITORING WELLS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | UNITS | BMW-1S | BMW-3S | Prediction Limit UG-1A | UG-1A | Prediction Limit UG-2 | UG-2 | Prediction Limit DG-1 | DG-1 | Prediction Limit DG-2 | DG-2 | Prediction Limit DG-3 | DG-3 | Prediction Limit DG-4 | DG-4 |
| October 2022 Detection Monitoring Event | | | | | | | | | | | | | | | |
| DATE | NA | 10/18/2022 | 10/18/2022 | NA | 10/21/2022 | NA | 10/21/2022 | NA | 10/20/2022 | NA | 10/21/2022 | NA | 10/21/2022 | NA | 10/21/2022 |
| pH | SU | 6.84 | 7.01 | 6.423-7.284 | 6.26 | 6.29-7.36 | 7.00 | 6.653-7.324 | 6.95 | 6.681-7.341 | 6.93 | 6.64-7.251 | 6.89 | 6.617-7.24 | 6.94 |
| BORON, TOTAL | µg/L | 73.0 J | 84.2 J | 462.2 | ND | 264.7 | 184 | 118.8 | ND | 114.3 | ND | 103.9 | ND | 114.5 | ND |
| CALCIUM, TOTAL | µg/L | 168,000 | 131,000 | 204,191 | 109,000 | 146,120 | 122,000 | 174,000 | 131,000 | 161,503 | 130,000 | 168,024 | 162,000 | 167,122 | 136,000 |
| CHLORIDE, TOTAL | mg/L | 9.2 | 11.7 | 147.5 | 6.4 | 98.49 | 59.2 | 10 | 3.4 | 10.72 | 2.8 | 17.71 | 3.3 | 111.7 | 54.0 |
| FLUORIDE, TOTAL | mg/L | 0.20 J | 0.22 | 0.4 | 0.47 | 0.3257 | ND | 0.3803 | ND | 0.4553 | ND | 0.4775 | ND | 0.4524 | ND |
| SULFATE, TOTAL | mg/L | 61.1 | 27.8 | 115.8 | 72.2 | 95.94 | 47.3 | 71.52 | 28.1 | 68.0 | 32.3 | 72.94 | 63.8 | 80.26 | 52.0 |
| TOTAL DISSOLVED SOLIDS | mg/L | 711 | 467 | 810.6 | 279 | 758 | 649 | 548.8 | 517 | 537.9 | 1,320 J | 592.9 | 622 | 808 | 636 |
| January 2023 Verification Sampling Event | | | | | | | | | | | | | | | |
| DATE | NA | | | | 1/4/2023 | | | | | | 1/3/2023 | | 1/3/2023 | | |
| pH | SU | | | | 7.04 | | | | | | | | | | |
| BORON, TOTAL | µg/L | | | | | | | | | | | | | | |
| CALCIUM, TOTAL | µg/L | | | | | | | | | | | | | | |
| CHLORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| FLUORIDE, TOTAL | mg/L | | | | ND | | | | | | | | | | |
| SULFATE, TOTAL | mg/L | | | | | | | | | | | | | | |
| TOTAL DISSOLVED SOLIDS | mg/L | | | | | | | | | | 474 | | 595 | | |

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. 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.

# Figures




TITLE

# SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

**Legend**

- Sioux Energy Center Property Boundary

**CCR Units**

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

**Utility Waste Landfill Cells**

- SCL4A - Dry CCR Disposal Area
- SCPC - Inactive FGD Surface Impoundment (Closure in Progress)
- SCPD - FGD Surface Impoundment

**Monitoring Well Networks**

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

**NOTES**

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

**REFERENCES**

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

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

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

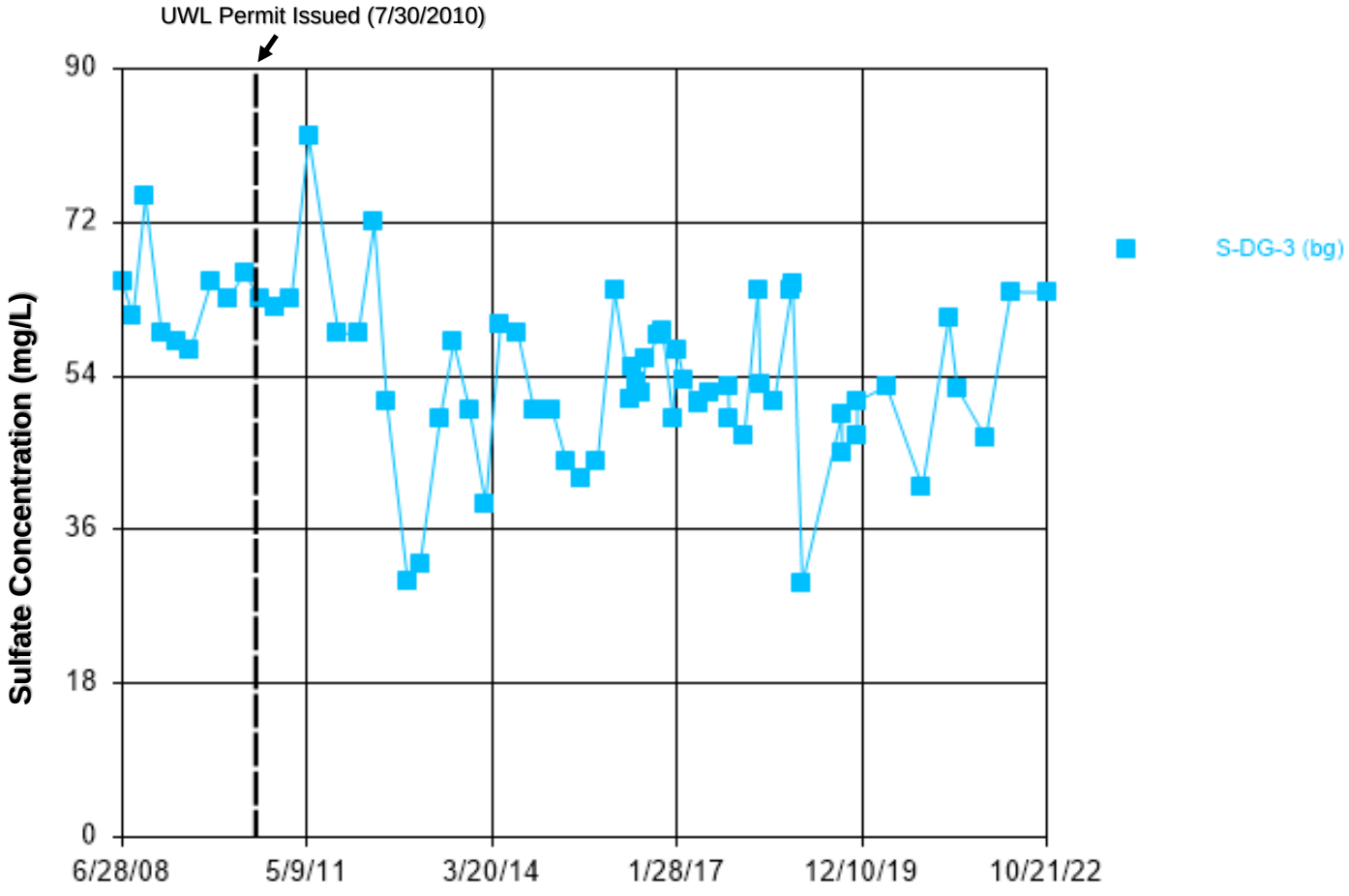
ROCKSMITH GEOENGINEERING

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

**FIGURE 1**

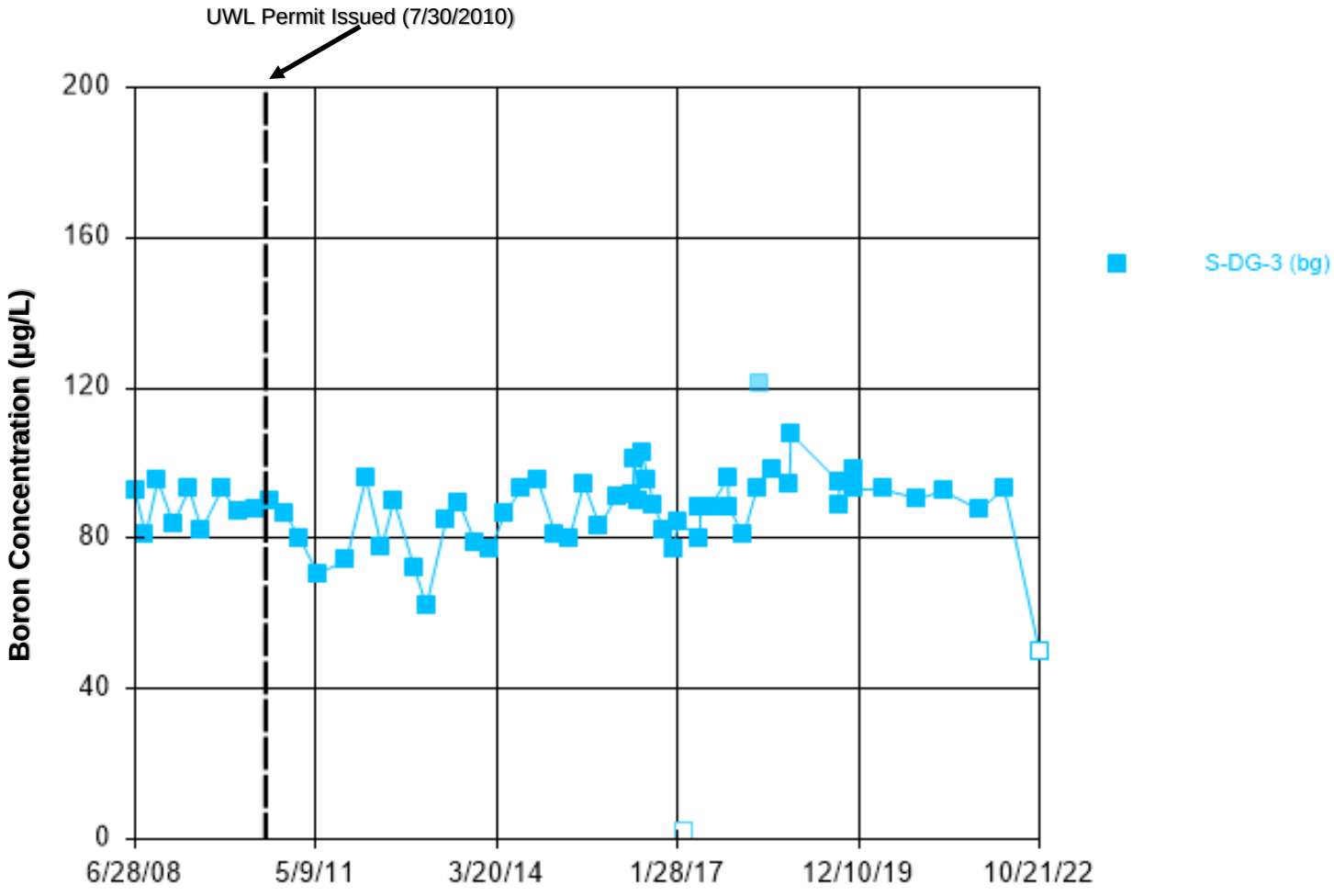
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in

Path: C:\Users\GrantMoney\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings_Figures\4.3-SEC\4.3.2 - Production\Other Maps\Figure 1- SEC Well Locations.aprx



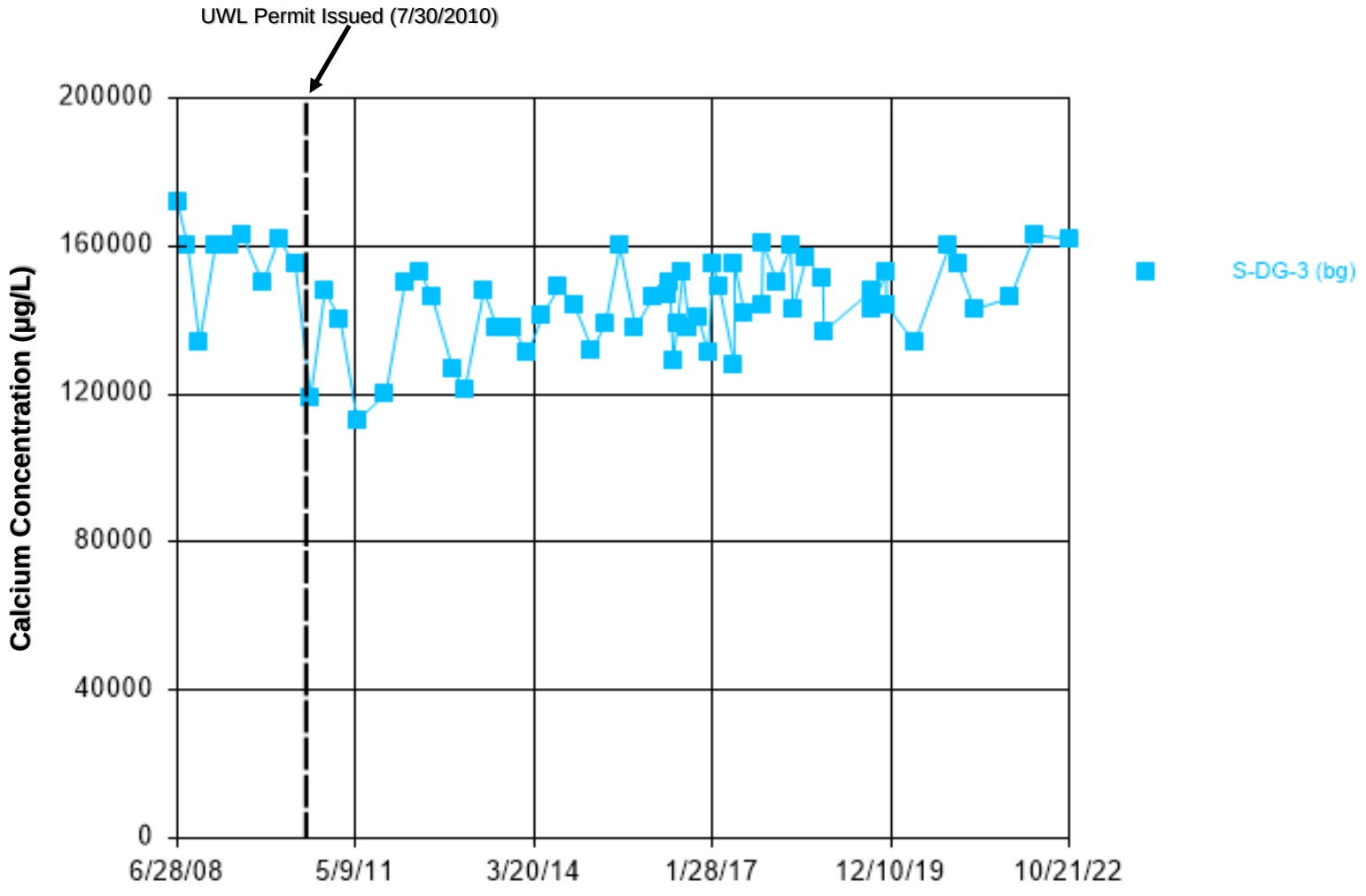

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | | TITLE | | |
|---|---|---|---|---|---|---|---|
| AMEREN MISSOURI<br>SIOUX ENERGY CENTER | | | | | Timeseries Plot of Sulfate Concentrations at DG-3 | | |
| DRAWN | CHECKED | REVIEWED | DATE | | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | | NA | 23009 | 2 |



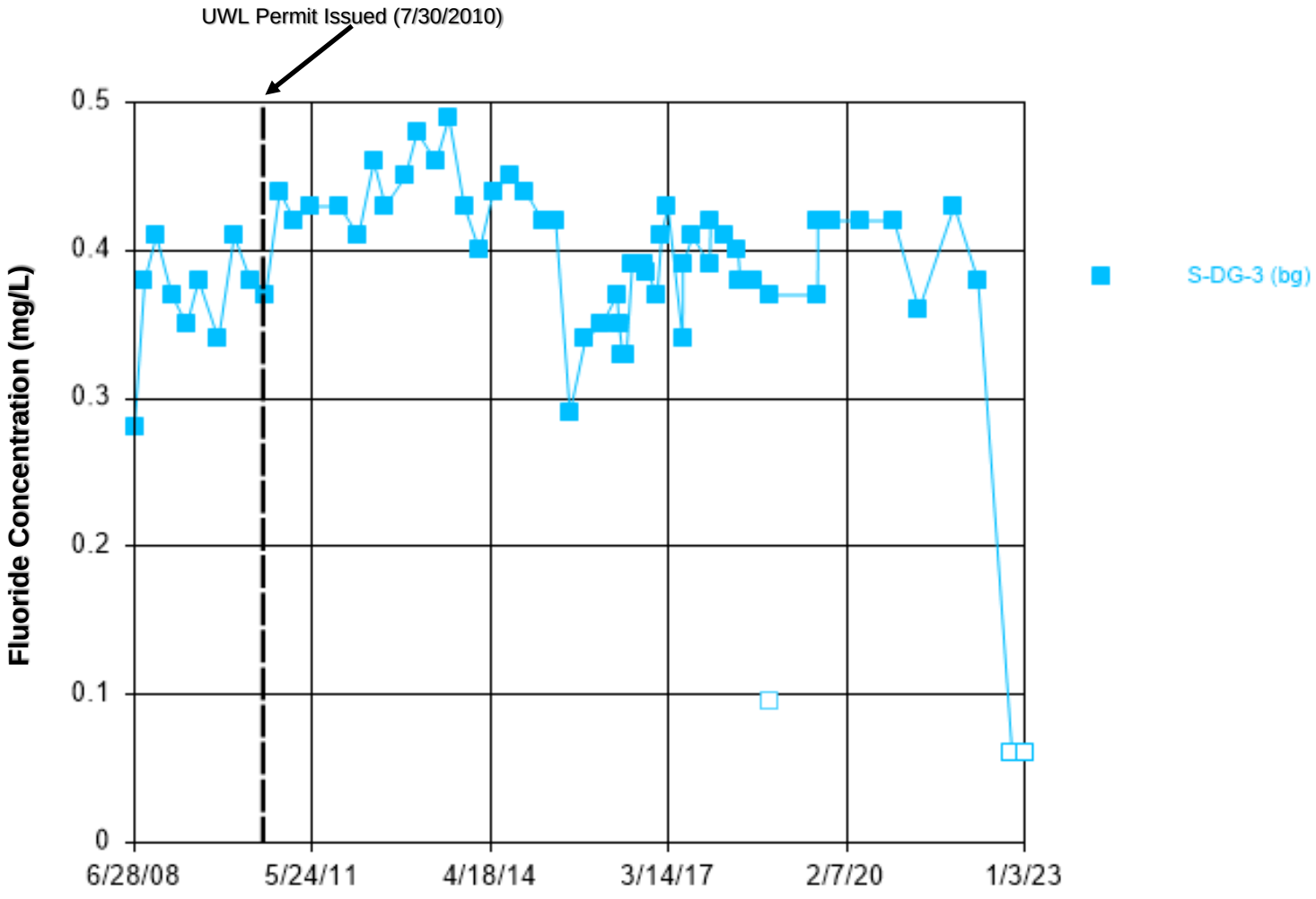

Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Boron Concentrations at DG-3** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **3** |



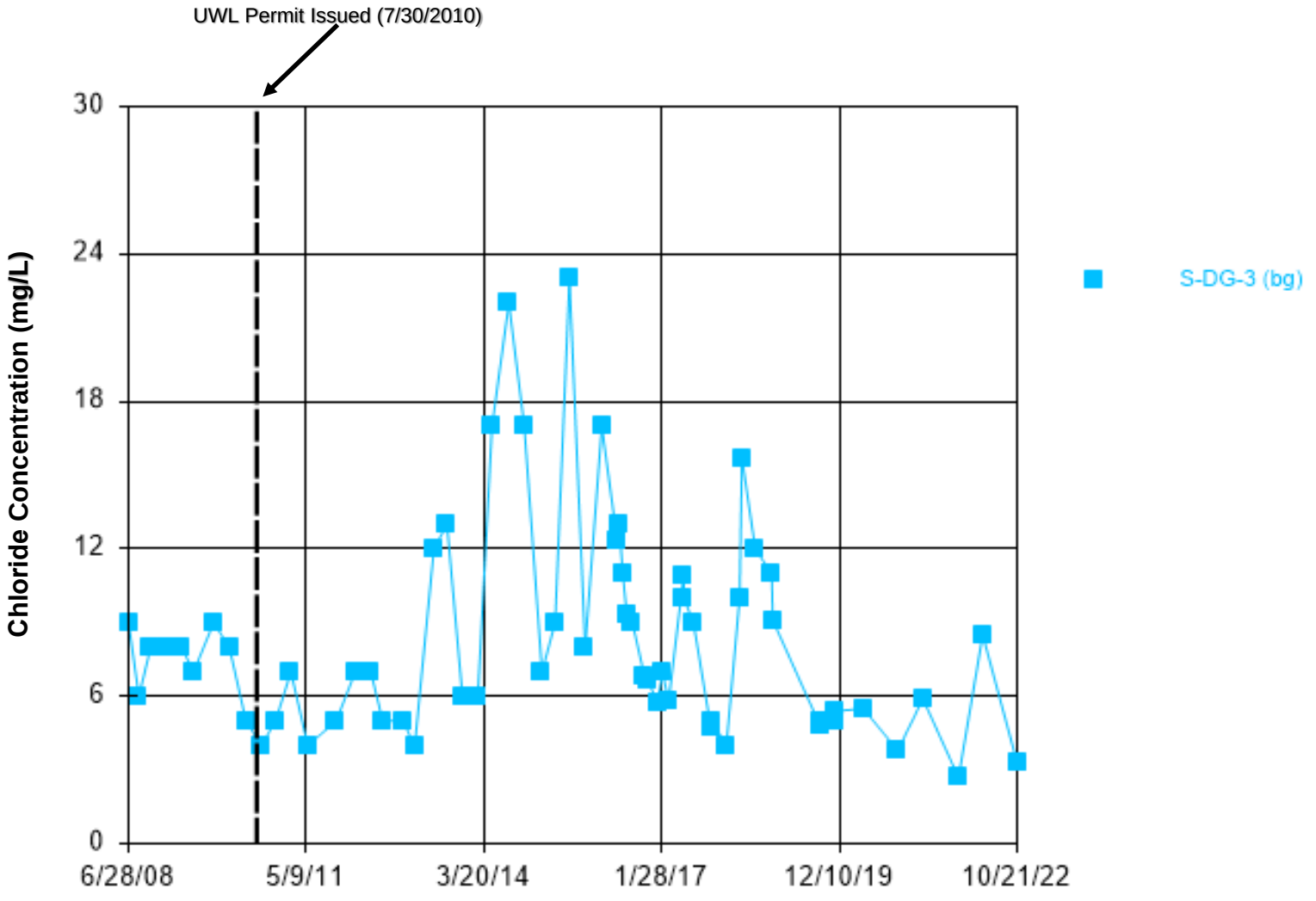

Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Calcium Concentrations at DG-3** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **4** |



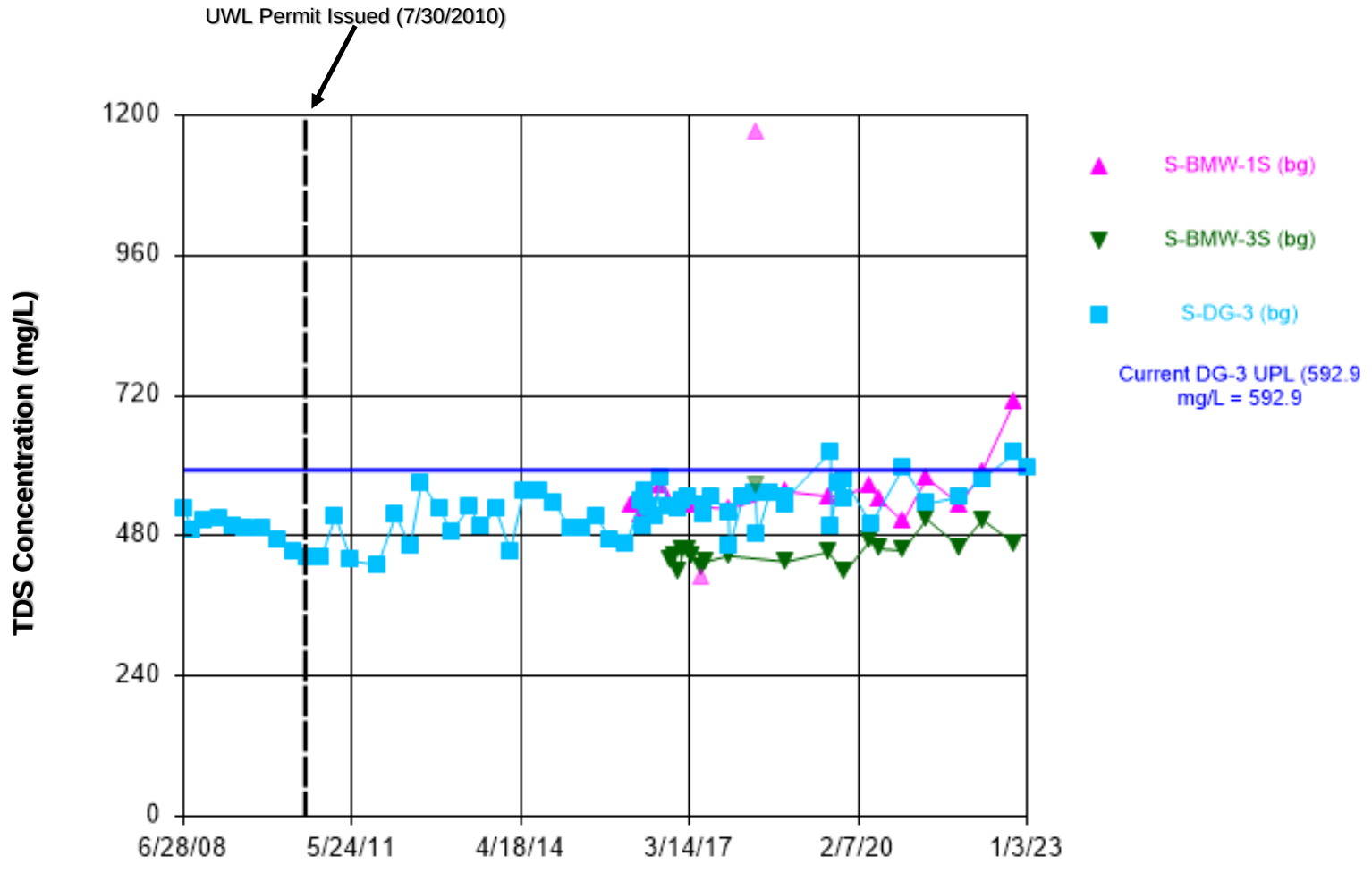

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Non-detected concentrations are depicted as unfilled points.
6) Data points not connected to lines are considered outliers.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Fluoride Concentrations at DG-3** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **5** |



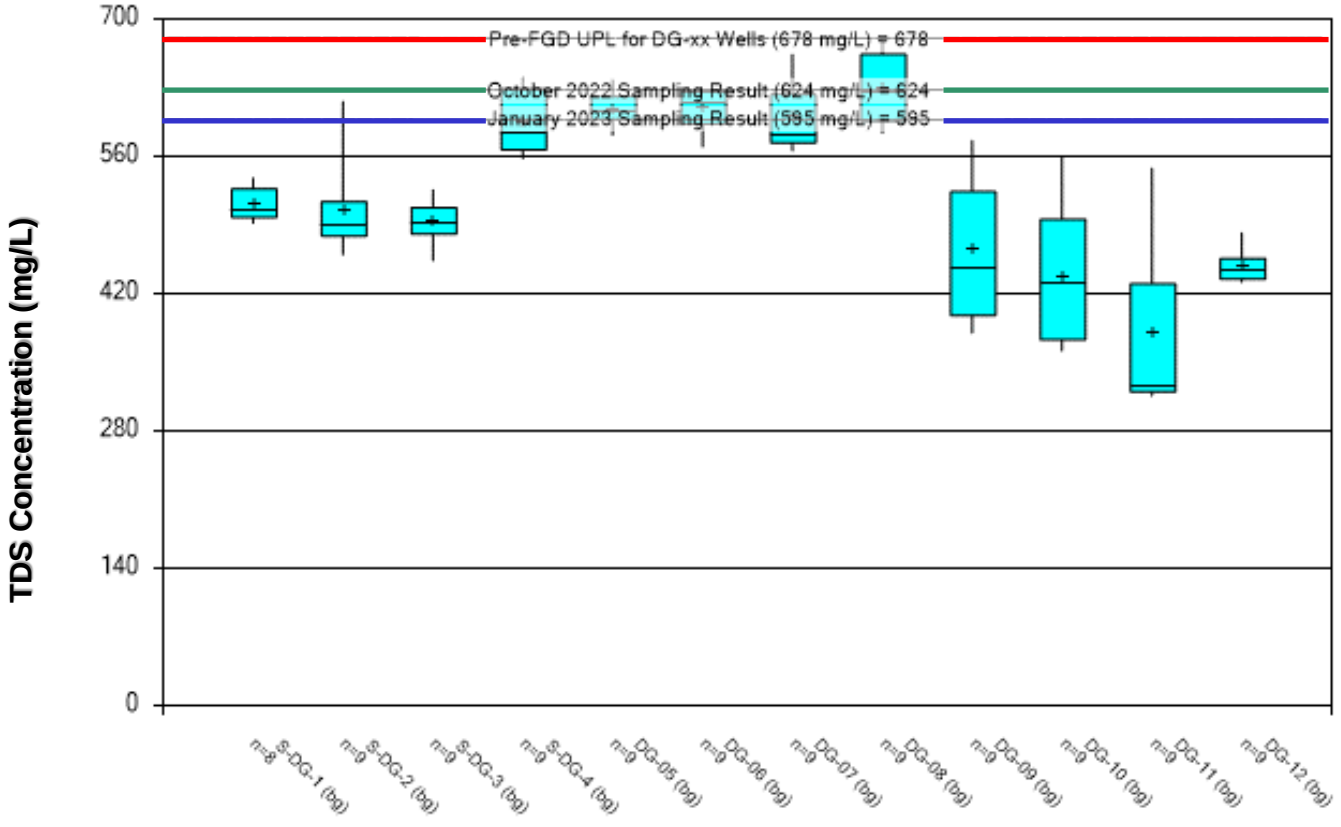

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Chloride Concentrations at DG-3** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **6** |




Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Data points not connected to lines are considered outliers.
6) TDS – Total Dissolved Solids.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of TDS Concentrations at DG-3 and Background Wells** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **7** |




**Pre-CCR Downgradient**
**UPL (678 mg/L)**
**October 2022 Result (624 mg/L)**
**January 2022 Result (595 mg/L)**

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Only data collected prior to July 30, 2010, is used to generate box and whisker plots.
6) TDS – Total Dissolved Solids.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Pre-CCR Total Dissolved Solids Plots – Downgradient Monitoring Wells** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | JSI | MNH | 2023-03-28 | NA | 23009 | **8** |

ROCKSMITH GEOENGINEERING

# Appendix C

## Alternative Source Demonstration – May 2023 Sampling Event

REPORT

# SCPC – Alternative Source Demonstration

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

**December 18, 2023**

**Project Number: 23009**

**Submitted to:**

Ameren Missouri
1901 Chouteau Ave
St. Louis, MO 63103

**Submitted by:**

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

# Table of Contents

## TABLES



## FIGURES

# 1.0 CERTIFICATION STATEMENT

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

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

**Rocksmith Geoengineering, LLC.,**


_____

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

Principal Engineer, Senior Partner

# 2.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this SCPC – Alternative Source Demonstration has been prepared to document an Alternative Source Demonstration (ASD) for 3 Statistically Significant Increases (SSIs) identified for Ameren Missouri's (Ameren's) Sioux Energy Center (SEC), Utility Waste Landfill (UWL) SCPC Cell 1. This document satisfies the requirements of §257.94(e)(2), which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

# 3.0 SITE DESCRIPTION AND BACKGROUND

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

## 3.1 Geological and Hydrogeological Setting

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

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

## 3.2 Utility Waste Landfill – SCPC


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

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

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

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

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

## 3.3 CCR Rule Groundwater Monitoring

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

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

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

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

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

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

In May 2023, three initial exceedances were identified: boron at UG-2 as well as sulfate and TDS at DG-3. Verification sampling results confirmed each of the three initial exceedances. Results from this sampling event are provided in **Table 1**.

# 4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Monitoring wells UG-2 and DG-3 are screened in the upper portion of the alluvial aquifer, just below the average seasonal low for groundwater. As shown in **Figure 1**, DG-3 is located south of the SCPC while UG-2 is located north of the SCPC. Both wells are south of the generating plant, highway 94, and the two surface impoundments near the plant (SCPA and SCPB), and north of Dwiggins Road.

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

**Table 2: Review of Statistically Significant Increases**

| Constituent | Well ID | UPL Based on Baseline Events | August 2019 Updated UPL | Current UPL (Updated March 2022) | Baseline Sampling Event Range | Range of Values Prior to May 2023 Sampling Event (CCR Rule and State UWL Sampling) | May 2023 Result | July 2023 Result |
|---|---|---|---|---|---|---|---|---|
| Boron (µg/L) | UG-2 | 234.6 | 208.9 | 264.7 | 88.2 – 196 | ND (<100) – 2,180 | 458 | 291 |
| Sulfate (mg/L) | DG-3 | 61.41 | 59.31 | 72.94 | 49.1 – 59.4 | 29.7 - 82 | 76.3 | 75.8 |
| Total Dissolved Solids (mg/L) | DG-3 | 580 | 624.7 | 592.9 | 528 – 580 | 430 - 624 | 640 | 665 |

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

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

# 5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

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

- Southward groundwater flow from the upgradient SCPA CCR Unit, currently in Corrective Action, towards the SCPC.
- Documentation of pre-existing, low-level concentrations of CCR indicators and other parameters in groundwater that pre-date the SCPC operation, especially on the northern side of the SCPC.

- Lack of elevated FGD Indicators (sulfate, calcium, chloride) above pre-CCR placement levels in monitoring wells with SSIs.
- Construction documents of the SCPC indicating the 60-mil high-density polyethelyne (HDPE) geomembrane liner and a 2-foot thick clay barrier met quality assurance testing during construction.

## 5.1 CCR Indicators

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

**Table 3: Types of CCR and Typical Indicator Parameters**

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

Notes:

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

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

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

### *5.2.1 Key Indicators for FGD Type Impacts*

As displayed in **Table 3**, boron can be a key indicator of FGD impacts because it is typically present in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). However, boron is typically only a key indicator for unwashed gypsum, as concentrations for washed gypsum may be too low to be useful.

As a part of the EPRI 2012 report, EPRI investigated what constituents would be the most beneficial indicator parameters for FGD gypsum impacts. **Table 4** (in text) provides a further evaluation of the key FGD indicator parameters as provided in the EPRI 2012 report.

**Table 4 – Key Indicators for FGD Impacts**

| Constituent | Advantages and Caveats |
|---|---|
| Sulfate | High concentrations expected in both washed and unwashed FGD gypsum (EPRI, 2011a). Commonly analyzed. Very mobile in all hydrogeologic environments. Less useful in strongly reducing environments where sulfate can be reduced to hydrogen sulfide gas. |
| Fluoride | Mobile and non-reactive in common hydrogeologic environments. Assure that leachate concentration is higher than background, particularly for washed gypsum. |
| Calcium | High concentrations expected in both washed and unwashed FGD gypsum (EPRI, 2011a). Understanding of carbonate chemistry necessary to assure that precipitation or dissolution does not affect downgradient concentrations. |
| Boron | Mobile indicator constituent for unwashed FGD gypsum. Concentrations for washed gypsum may be too low to be useful (EPRI, 2011a). |
| Bromide | Mobile indicator constituent for unwashed FGD gypsum, especially if Br-PAC or CaBr used for mercury controls. Concentrations for washed gypsum may be too low to be useful (EPRI, 2011a). |
| Chloride | 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 (EPRI, 2011a). |

Notes:

1) Table from EPRI 2012, Table 3-3.

As discussed in section 3.2, the WFGD process occurs after the removal of slag and fly ash. A crushed limestone (CaCO3) mix is introduced into the boiler flue gas flow. The limestone reacts with sulfur dioxide (SO2) in the flue gas and produces 'synthetic' gypsum (calcium sulfate dihydrate (CaSO4 * 2H2O)). When the SCPC was actively receiving CCR waste, the resultant gypsum material was wet sluiced from the plant across Highway 94 to the SCPC. Once there, the gypsum was 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). Therefore, based on the handling of FGD materials at the SCPC, and discussions from the EPRI 2012 report, it would be expected that sulfate, calcium, chloride, and sodium concentrations would increase if there were groundwater impacts caused by the SCPC. Impacts to boron, calcium, and fluoride concentrations are possible, although these constituents are expected to be secondary and not as distinct.

### *5.2.2 Concentrations of FGD Indicators at UG-2*

**Figures 2-7** display time series plots of the FGD indicators (boron, sulfate, fluoride, calcium, chloride, sodium) at UG-2 compared to their respective UPLs, initial placement of FGD materials at the SCPC (7/30/2010), construction of the adjacent SCL4A (8/16/2014), and commencement of closure of the SCPC (12/14/2022). **Table 5** below provides a summary of each FGD indicator constituent, including the range of sample results prior to the placement of FGD materials at the SCPC, a UPL calculated from the constituents prior to the placement of FGD materials, the current UPL, and most recent results.

**Table 5: Summary of FGD Indicator Parameters at UG-2**

| Constituent | Pre-FGD Placement Sampling Concentration Range (Prior to 7/30/2010) | Calculated UPL Based on Pre-FGD Placement | Range of Values Prior to May 2023 Sampling Event (CCR Rule and State UWL Sampling) | Current UPL (Updated March 2022) | May 2023 Result | June 2023 Result |
|---|---|---|---|---|---|---|
| Boron (µg/L) | 148 - 322 | 397.1 | ND (<100) – 2,180 | 264.7 | 458 | 291 |
| Sulfate (mg/) | 53 - 76 | 84.65 | 17.7 - 122 | 95.94 | 51.8 | NS |
| Fluoride (mg/L) | 0.21 – 0.31 | 0.3371 | ND (<0.12) – 0.34 | 0.3257 | ND (<0.12) | NS |

| Constituent | Pre-FGD Placement Sampling Concentration Range (Prior to 7/30/2010) | Calculated UPL Based on Pre-FGD Placement | Range of Values Prior to May 2023 Sampling Event (CCR Rule and State UWL Sampling) | Current UPL (Updated March 2022) | May 2023 Result | June 2023 Result |
|---|---|---|---|---|---|---|
| Calcium (µg/L) | 122,000 – 164,000 | 175,535 | 80,500 – 164,000 | 146,120 | 115,000 | NS |
| Chloride (mg/) | 22.0 - 113 | 138.4 | 2.3 - 113 | 98.49 | 37.2 | NS |
| Sodium (mg/L) | 29.6 – 88.5 | 108.1 | 5.42 – 88.5 | NA | 26 | NS |

Notes:
1) NA – Not Applicable. No limit calculated for sodium as it is not a CCR Rule Appendix III or IV parameter.
2) NS – Not Sampled.
3) ND – non-detect. Not detected above the Method Detection Limit (MDL).
4) mg/L – milligrams per liter.
5) µg/L – micrograms per liter.

As displayed on **Figures 2 - 7** and summarized in **Table 5**, boron is the only potential FGD indicator parameter present at a level above pre-FGD placement values. Concentrations for the other FGD indicator parameters, including the key FGD indicator parameters of sulfate, calcium, and chloride are at or below pre-FGD placement levels. The lack of increased sulfate, calcium, chloride, and sodium concentrations at UG-2 indicates that a source other than the FGD at the SCPC is the cause of the SSI at UG-2.

### *5.2.3 Evaluation for Cause of Elevated Boron Concentrations at UG-2*

In 2018, an ASD was completed for the SCPB (fly ash pond) unit to the north/northwest of the SCPC and is available in the 2018 Annual Report for the SCPB on Ameren's publicly available website[1]. In that ASD, pore-water samples were collected from the SCPA and SCPB, and samples were collected in the shallow, intermediate (middle) and deep zones of the alluvial aquifer just outside of the two units. From this ASD, it was determined that CCR impacts found directly outside of the SCPB are from the SCPA and not the SCPB. Impacts were present at their highest concentrations at deeper depths, and groundwater chemistry was similar between the waters of the SCPA and the impacted wells. The SCPB ASD concluded these deeper impacts are from the SCPA because the SCPA is an unlined CCR unit that extends approximately 70 feet below ground surface, while the SCPB is an HDPE-lined, shallower CCR unit. Therefore, if impacts were from the SCPB, they would be expected to be concentrated in the shallow zone of the alluvial aquifer, whereas impacts from the SCPA would be present across all zones of the alluvial aquifer. Additionally, the SPCA has historically managed bottom ash, fly ash, and boiler slag. As displayed in **Table 2**, boron is a key indicator parameter for impacts from these types of CCR.

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

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

For boron impacts to be from the SCPA, UG-2 would need to be hydraulically connected to the SCPA. As displayed on **Figure 1**, UG-2 is located approximately 1,500 feet to the south/southeast of the SCPA at its nearest

[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)

point. As discussed in the Annual Reports for the SCPC, publicly available on Ameren's website, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Missouri Rivers, which affect water levels, gradients and flow directions in the aquifer. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. Water flows into and out of the alluvial aquifer as a result of fluctuating river water levels that produce "bank recharge" and "bank discharge" conditions. At this facility, groundwater can flow north or south toward the Mississippi and Missouri Rivers, depending on river levels.

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

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

A daily water gauge measurement is available for each of these four gauges since at least November 15, 1986. **Figure 8** 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 8**. The Missouri River does not have any dams located near the SEC, with the closest dam on the Missouri River being the Gavins Point Dam, located near Yankton, South Dakota. Therefore, the Missouri River is susceptible to larger variations in elevation caused by flooding and drought, as displayed in **Figure 8**.

**Figure 9** 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 November 9, 2023, the Mississippi River was higher than the Missouri River on 7,472 of the 13,462 days (approximately 56% of the time). Since 2021, the hydraulic gradient between the rivers has been higher, with 2023 on pace to be the second highest 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 taken 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 6 – 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 |

| 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) |
|---|---|---|---|
| 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 | 293 | 3.14 |
| **Total** | **5990** | **7472** | **Average Difference – 0.32 feet** |

## 5.3 Evaluation of the Statistically Significant Increases of Sulfate and Total Dissolved Solids at DG-3

### *5.3.1 Evaluation of Sulfate SSI at DG-3*

As described in **Table 4**, sulfate, along with calcium, chloride, and sodium are the key indicator parameters for FGD impacts at the SCPC. Sulfate is a key indicator for potential FGD impacts because high concentrations are expected in both washed and unwashed FGD and it is highly mobile in most hydrogeological environments, except where conditions are strongly reducing. The groundwater around the SCPC 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 SCPC.

As displayed on **Figure 10,** prior to placement of FGD materials in the SCPC, sulfate concentrations at DG-3 ranged from 57 to 75 mg/L. Using these 9 sampling results, the pre-FGD UPL is 78.01 mg/L, which is greater than the May 2023 sampling result of 76.3 mg/L and the subsequent July 2023 verification sampling result of 75.8 mg/L.

The time series plot on **Figure 11** shows the high degree of variability in sulfate concentrations at the DG-xx wells used to monitor the southern side of the SCPC since the onset of monitoring (DG-1, DG-2, DG-3, and DG-4). This figure provides further evidence that the sulfate values from May and July 2023 at DG-3 reflect the geochemical variability within the groundwater and they are not elevated compared to pre-FGD placement sulfate concentrations in the area. Three other compliance monitoring wells are located within approximately 900 feet to the east and west of DG-3 as displayed in **Figure 1**, which are DG-1, DG-2, and DG-4. Sulfate concentrations in these monitoring wells ranged from 36 to 83 mg/L prior to the placement of FGD in the SCPC and UPLs for these monitoring wells using pre-FGD placement values are 88.91 mg/L for DG-1, 71.26 mg/L for DG-2, 83 mg/L for DG-4, and 84.59 mg/L for an interwell combined UPL using DG-1, DG-2, DG-3 and DG-4. Based on the sulfate concentration range of the nearby wells, the sulfate concentration in DG-3 for May 2023 is within the range of historical concentrations for adjacent wells prior to the placement of FGD materials.

If FGD materials are causing impacts at DG-3, it would be expected that chloride and calcium concentrations would also be increasing along with sulfate concentrations. As displayed in **Figures 12 and 13**, concentrations for calcium and chloride are at or below pre-FGD placement levels. The lack of increased calcium and chloride concentrations at DG-3 indicates that a source other than the FGD at the SCPC is likely the cause of the sulfate SSI at DG-3. The lines of evidence listed above indicate that the sulfate SSI at DG-3 in May 2023 is not the result of a release from the SCPC, but instead can be attributed to geochemical variability in the alluvial aquifer.

### *5.3.2 Elevated Total Dissolved Solids (TDS) at DG-3*

TDS alone is not a key indicator of CCR or FGD (EPRI 2017, EPRI 2012). As displayed on **Figure 14**, concentrations for the May 2023 and subsequent August 2023 verification sampling event are 640 and 665 mg/L, respectively. These values are just above the original calculated UPL used for TDS concentrations at DG-3 of 580 mg/L and the current UPL of 592.9 mg/L.

To further investigate the geochemical variability of TDS in the UWL area, the historical data from the state UWL wells (located on the south side of the SCPC, outside of the interpreted zone of impact form the SCPA) were reviewed. These UWL wells (labeled “DG-xx”) were installed and sampled on at least 9 occasions prior to the receipt of FGD in the SCPC. These DG-xx monitoring wells are screened at approximately the same depth as DG-3 in the shallow zone of the alluvial aquifer. **Figure 15** displays a box and whisker plot of the TDS concentrations for the DG-xx wells prior to the receipt of FGD in the SCPC, which represents natural variability in local groundwater chemistry. Using all pre-disposal data from the twelve DG-xx wells, the non-parametric UPL for TDS is 678 mg/L. As displayed in **Figure 15**, the May 2023 and August 2023 sampling results are within the pre-FGD limits using the monitoring wells near DG-3 and display that the May 2023 and August 2023 results are within the historical range (290 – 678 mg/L) for the site.

As discussed above, the majority of TDS is made up of calcium, magnesium, sodium, potassium, chloride, sulfate, and alkalinity concentrations. **Table 7** displays the concentrations of each of these constituents collected during semi-annual detection monitoring sampling events since November 2018 at DG-3.

**Table 7 – Total Dissolved Solids Major Constituent Concentrations over Time at DG-3**

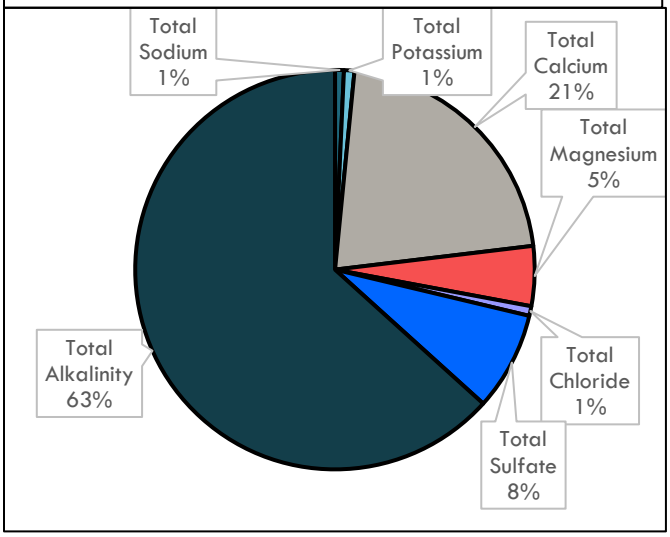
| Sample Date | Total Sodium (mg/L) | Total Potassium (mg/L) | Total Calcium (mg/L) | Total Magnesium (mg/L) | Total Chloride (mg/L) | Total Alkalinity (mg/L) | Total Sulfate (mg/L) |
|---|---|---|---|---|---|---|---|
| 11/13/2018 | 4.42 | 5.12 | 137 | 29.5 | 9.1 | 432 | 64.7 |
| 8/19/2019 | 4.68 | 6.47 | 148 | 39.1 | 4.8 | 450 | 49.5 |
| 11/14/2019 | 4.78 | 6.70 | 144 | 38.1 | 5.4 | 447 | 51.1 |
| 4/28/2020 | 4.60 | 5.22 | 134 | 28.5 | 5.5 | 412 | 52.8 |
| 11/17/2020 | 5.54 | 6.58 | 160 | 38.4 | 3.8 | 451 | 41.0 |
| 4/14/2021 | 4.47 | 5.03 | 143 | 29.1 | 5.9 | 405 | 60.9 |

| Sample Date | Total Sodium (mg/L) | Total Potassium (mg/L) | Total Calcium (mg/L) | Total Magnesium (mg/L) | Total Chloride (mg/L) | Total Alkalinity (mg/L) | Total Sulfate (mg/L) |
|---|---|---|---|---|---|---|---|
| 11/10/2021 | 5.18 | 5.76 | 146 | 32.5 | 2.7 J | 419 | 46.8 |
| 4/1/2022 | 5.15 | 6.15 | 163 | 28.3 | 8.5 | 460 | 63.9 |
| 10/21/2022 | 5.29 | 6.05 | 162 | 36.8 | 3.3 | 455 | 63.8 |
| 5/3/2023 | 4.83 | 5.63 | 159 | 35.6 | 6.9 | 480 | 76.3 |
| **Average Concentration** | **4.89** | **5.87** | **150** | **33.6** | **5.6** | **441** | **57.1** |
| **May 2023 Ranking** | **5th** | **7th** | **4th** | **5th** | **3rd** | **1st** | **1st** |

Notes:

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

**Figure 16 – Average Percentage of Overall Total Dissolved Solids by Constituent**




As displayed in **Figure 16**, based on average concentrations in **Table 4**, alkalinity, calcium, and sulfate concentrations make up approximately 92% of the total TDS value at DG-3. In the May 2023 sampling event, the alkalinity result was the highest of the 10 results since November 2018, calcium was 4th highest of the 10 results, and sulfate was highest of the 10 available results. As discussed previously, sulfate and calcium are primary indicators of FGD CCR impacts. Alkalinity is not considered a key indicator and accounts for 63% of TDS at DG-3, on average. The high alkalinity concentration at DG-3 in May 2023 relative to previous samples is the primary contributor to the elevated TDS observed, with a value 39 mg/L greater than average. The increased sulfate concentration at DG-3 is attributed to natural variability in groundwater chemistry, detailed above in Section 5.3.1. The May 2023 calcium result is within the range of previous results. Altogether, this indicates that the slightly elevated TDS value at DG-3 is primarily driven by increased alkalinity, which is not a key indicator of FGD CCR impacts. Geochemical variability in sulfate and calcium concentrations also contributes to the elevated TDS in May 2023.

The lack in increasing FGD indicators from prior to CCR placement with those present in the May 2023 sampling event and presence of TDS within the range of nearby wells and historical values demonstrates that TDS is within the pre-FGD placement range of concentrations for the aquifer in this area and not caused by impacts originating from the SCPC.

# 6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPC IMPACTS

Based on the information presented in Section 5.0 above, the SSIs reported for UG-2 and DG-3 during the May 2023 monitoring event are not a result of impacts from the SCPC. The SSI for boron at UG-2 is not caused by the SCPC as there is a lack of increasing key FGD parameters including sulfate, chloride and calcium. The SSI for boron at UG-2 appears to be the result of southward migrating impacts from the upgradient SCPA, which is currently in Corrective Action. The SSIs for sulfate and TDS at DG-3 were also not caused by impacts from the SCPC. These SSIs are the result of numerous factors including (1) relatively low calculated UPLs that do not

account for the geochemical variability present, (2) the concentrations are within the range of historical concentrations for adjacent wells prior to the placement of FGD materials, and (3) naturally occurring higher alkalinity, sulfate and calcium concentrations causing slightly elevated TDS values that have not yet been captured during post-FGD placement sampling at DG-3. Along with these lines of evidence listed above, the SCPC is documented to be constructed with an engineered compacted clay liner overlain by a 60-mil HDPE geomembrane liner system, which was designed and constructed to properly contain CCR and prevent groundwater impacts.

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# Tables

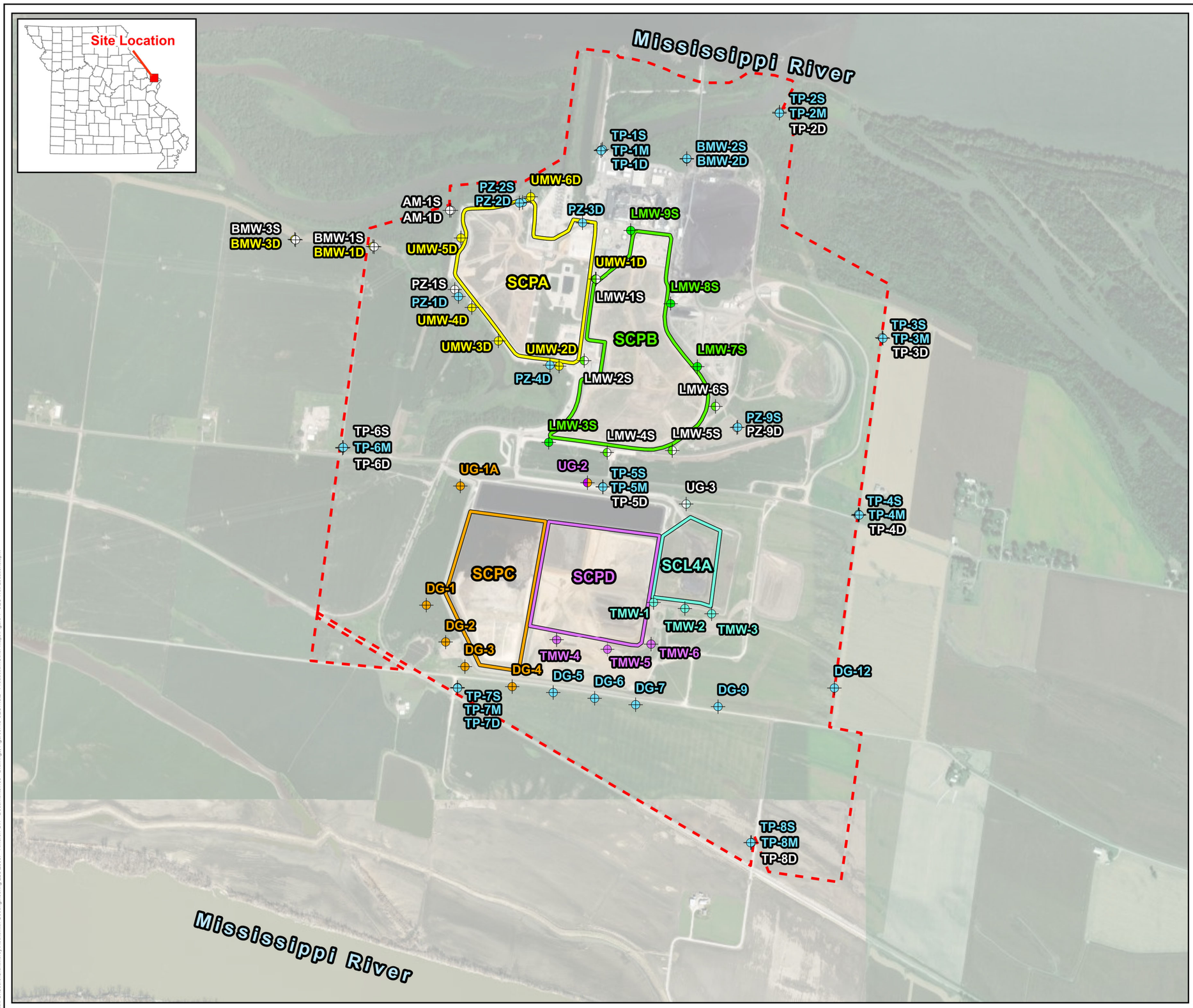
# Table 1
# May 2023 Detection Monitoring Results
# SCPC Surface Impoundment
# Sioux Energy Center, St. Charles County, MO

| | | BACKGROUND | | GROUNDWATER MONITORING WELLS | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ANALYTE | UNITS | BMW-1S | BMW-3S | Prediction Limit UG-1A | UG-1A | Prediction Limit UG-2 | UG-2 | Prediction Limit DG-1 | DG-1 | Prediction Limit DG-2 | DG-2 | Prediction Limit DG-3 | DG-3 | Prediction Limit DG-4 | DG-4 |
| May 2023 Detection Monitoring Event | | | | | | | | | | | | | | | |
| DATE | NA | 5/2/2023 | 5/2/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 | NA | 5/3/2023 |
| pH | SU | 6.80 | 6.95 | 6.423-7.284 | 6.95 | 6.29-7.36 | 7.09 | 6.653-7.324 | 6.95 | 6.681-7.341 | 6.98 | 6.64-7.251 | 6.90 | 6.617-7.24 | 6.90 |
| BORON, TOTAL | µg/L | 64.8 J | 67.1 J | 462.2 | 89.9 J | 264.7 | 458 | 118.8 | 96.9 J | 114.3 | 75.5 J | 103.9 | 83.6 J | 114.5 | 91.4 J |
| CALCIUM, TOTAL | µg/L | 184,000 | 137,000 | 204,191 | 138,000 | 146,120 | 115,000 | 174,000 | 129,000 | 161,503 | 126,000 | 168,024 | 159,000 | 167,122 | 139,000 |
| CHLORIDE, TOTAL | mg/L | 13.1 | 12.6 | 147.5 | 79.9 | 98.49 | 37.2 | 10 | 3.6 | 10.72 | 2.8 | 17.71 | 6.9 | 111.7 | 25.4 |
| FLUORIDE, TOTAL | mg/L | ND | ND | 0.4 | ND | 0.3257 | ND | 0.3803 | ND | 0.4553 | ND | 0.4775 | ND | 0.4524 | ND |
| SULFATE, TOTAL | mg/L | 37.7 | 32.4 | 115.8 | 49.4 | 95.94 | 51.8 | 71.52 | 29.5 | 68 | 28.4 | 72.94 | 76.3 | 80.26 | 56.9 |
| TOTAL DISSOLVED SOLIDS | mg/L | 610 | 495 | 810.6 | 622 | 758 | 496 | 548.8 | 499 | 537.9 | 481 | 592.9 | 640 | 808 | 601 |
| July 2023 Verification Sampling Event | | | | | | | | | | | | | | | |
| DATE | NA | | | | | | 7/11/2023 | | | | | | 7/11/2023[8] | | |
| pH | SU | | | | | | | | | | | | | | |
| BORON, TOTAL | µg/L | | | | | | 291 | | | | | | | | |
| CALCIUM, TOTAL | µg/L | | | | | | | | | | | | | | |
| CHLORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| FLUORIDE, TOTAL | mg/L | | | | | | | | | | | | | | |
| SULFATE, TOTAL | mg/L | | | | | | | | | | | | 75.8 | | |
| TOTAL DISSOLVED SOLIDS | mg/L | | | | | | | | | | | | 665 | | |

NOTES:
1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. NA - Not applicable.
4. 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.
8. Total Dissolved Solids sample at DG-3 collected on 8/1/2023.

Prepared By: GTM
Checked By: JSI
Reviewed By: MNH

# Figures




TITLE

# SIOUX ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND SAMPLE LOCATION MAP

**Legend**

- Sioux Energy Center Property Boundary

**CCR Units**

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

**Utility Waste Landfill Cells**

- SCL4A - Dry CCR Disposal Area
- SCPC - Inactive FGD Surface Impoundment (Closure in Progress)
- SCPD - FGD Surface Impoundment

**Monitoring Well Networks**

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

**NOTES**

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

**REFERENCES**

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

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

PROJECT
CCR RULE GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

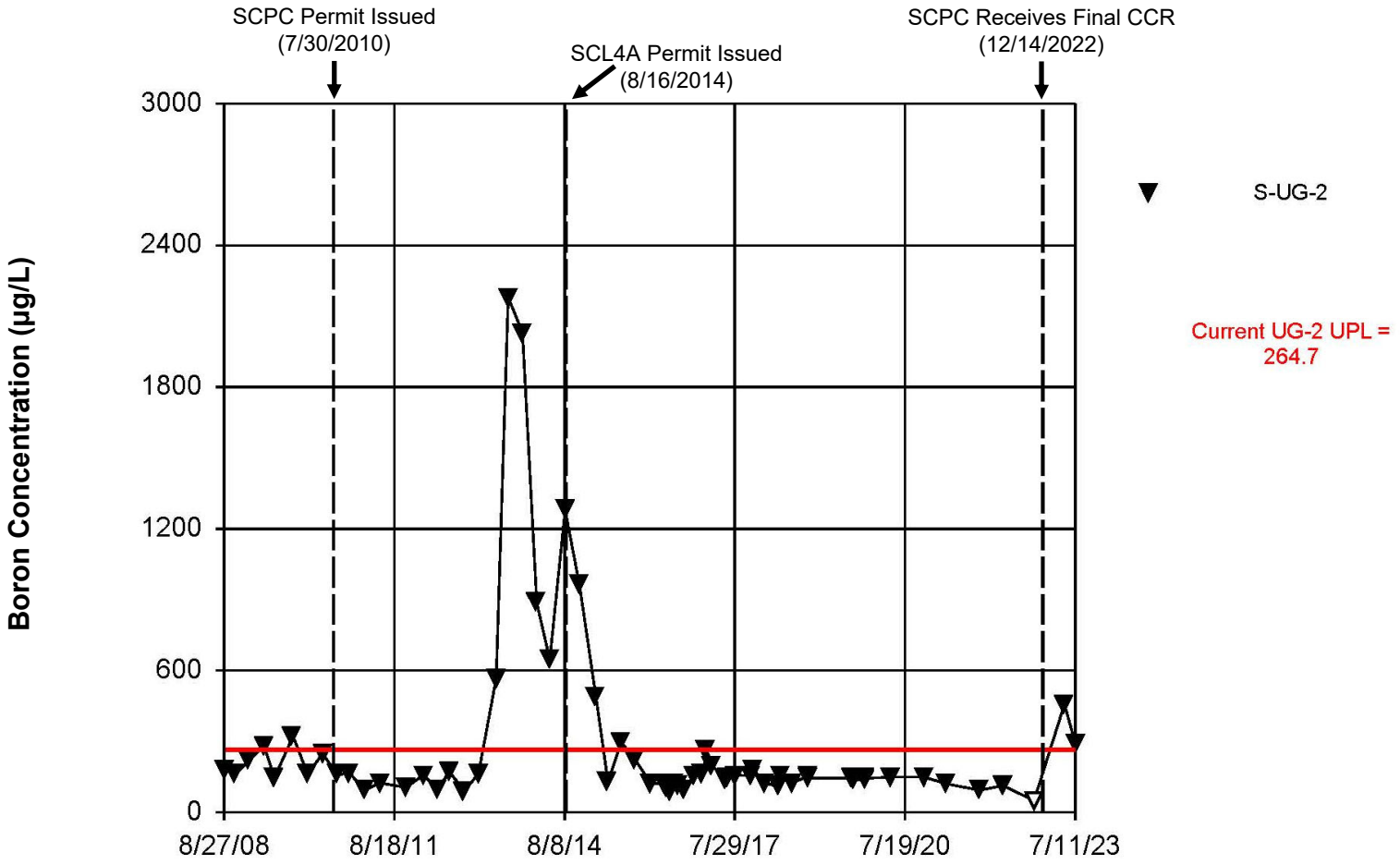
ROCKSMITH GEOENGINEERING

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

**FIGURE 1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in

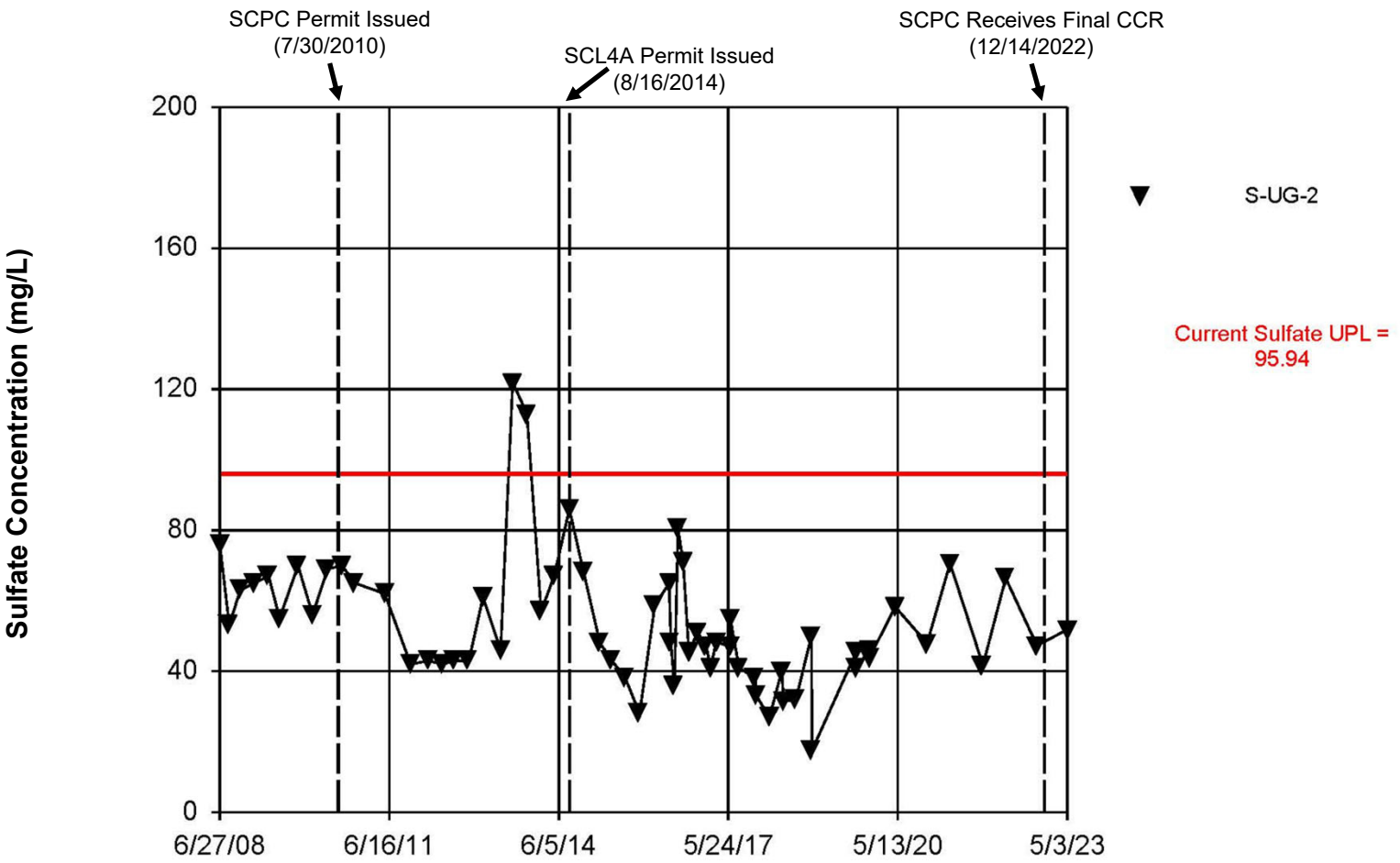
Path: C:\Users\GrantMoney\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings_Figures\4.3-SEC\4.3.2 - Production\Other Maps\Figure 1- SEC Well Locations.aprx




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

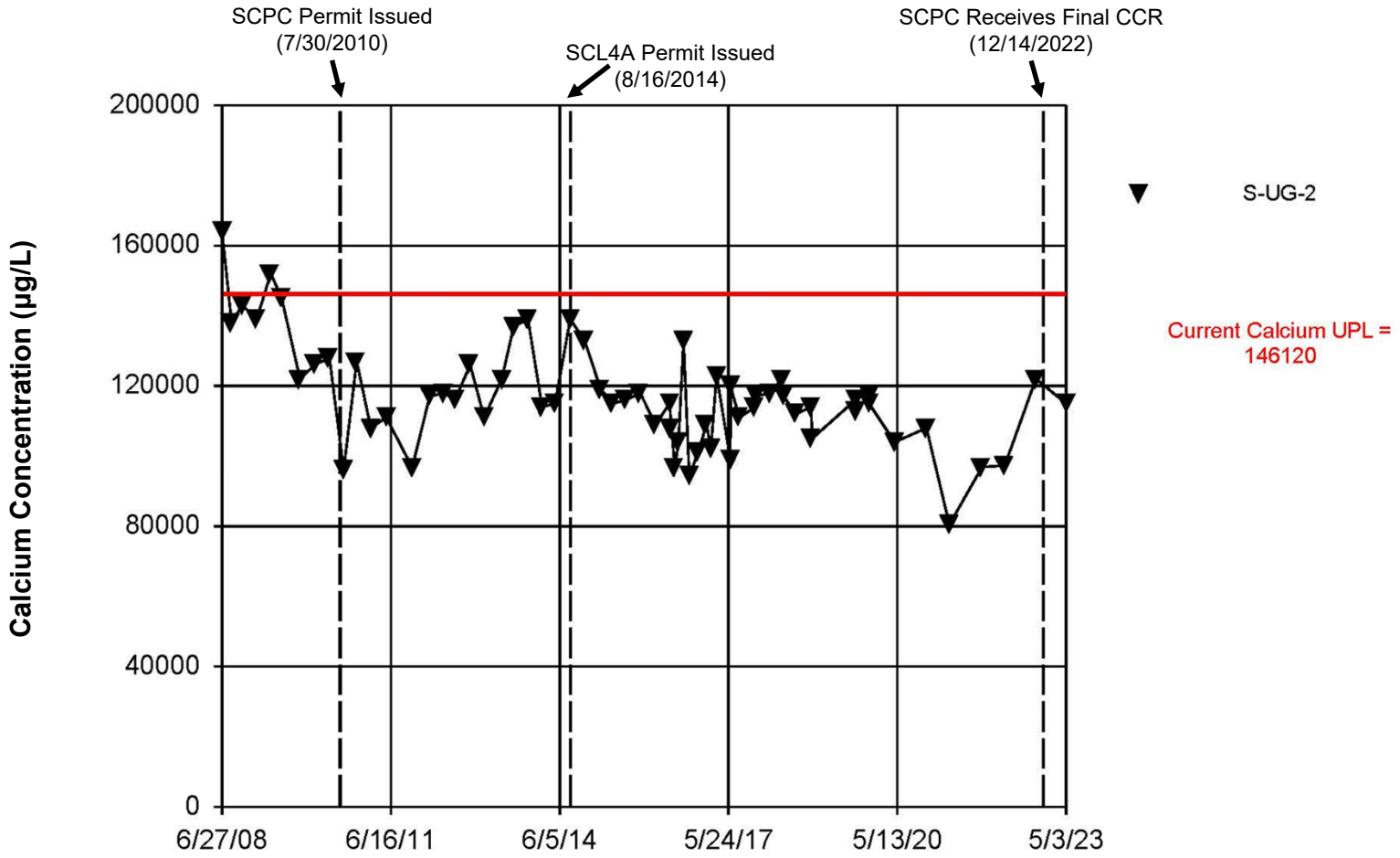
| CLIENT/PROJECT | | | | TITLE |
|---|---|---|---|---|
| **AMEREN MISSOURI SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Boron Concentrations at UG-2** |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. / JOB NO. / FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA / 23009 / **2** |

ROCKSMITH GEOENGINEERING



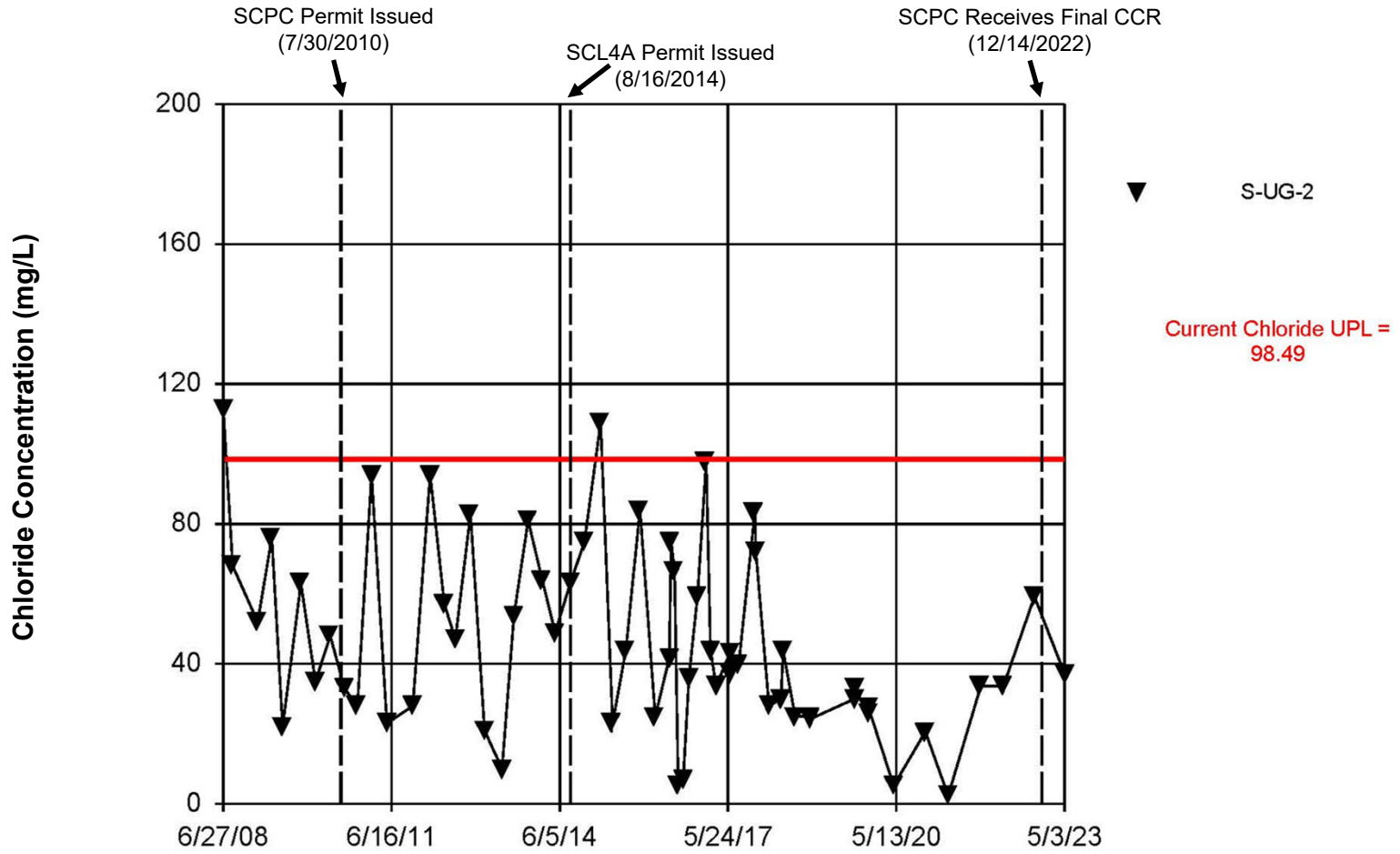

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Sulfate Concentrations at UG-2** | | |
| DRAWN<br>JSI | CHECKED<br>GTM | REVIEWED<br>MNH | DATE<br>2023-11-30 | Rev No.<br>NA | JOB NO.<br>23009 | FIGURE<br>**3** |



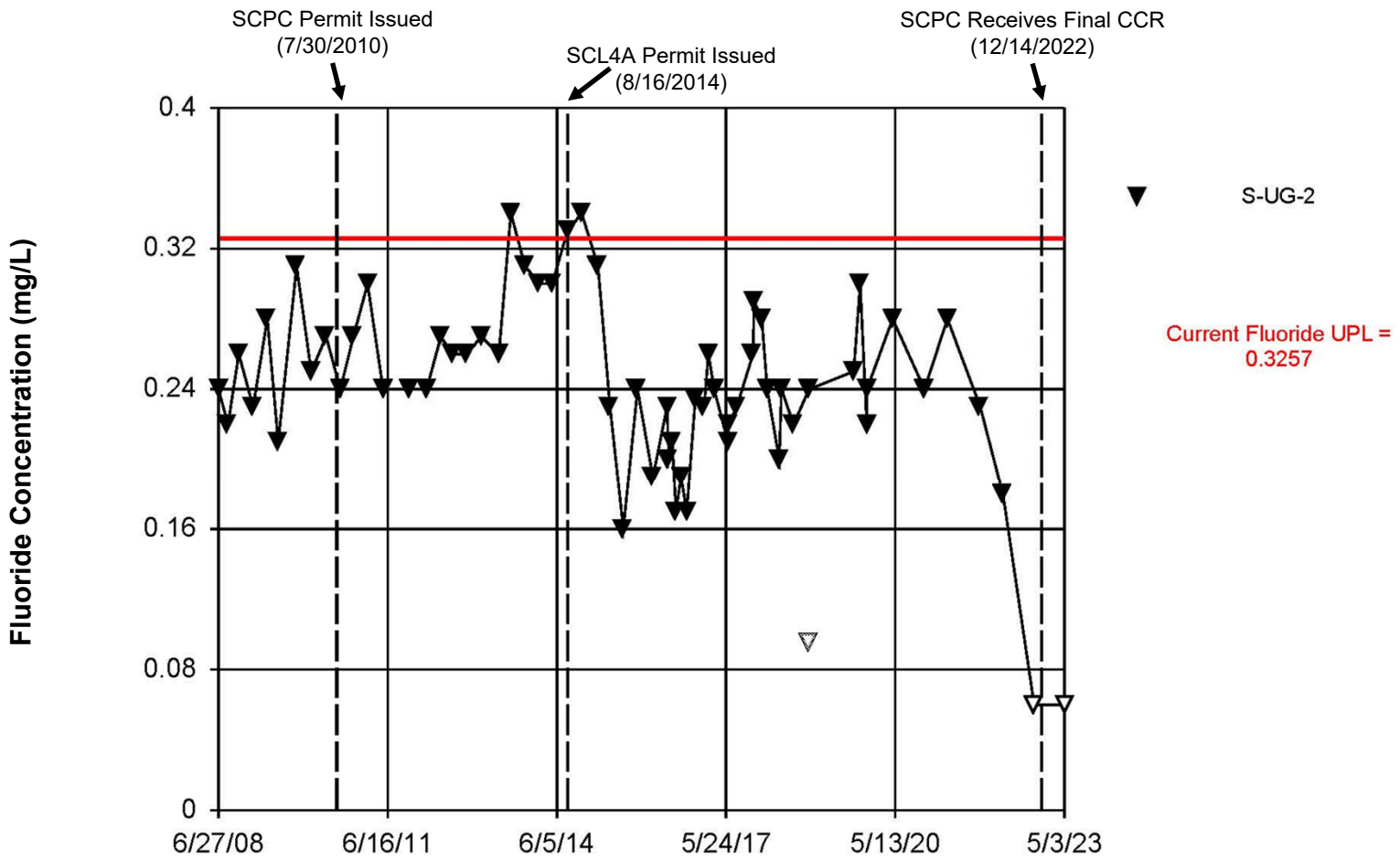

Notes
1) µg/L – Micrograms per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Calcium Concentrations at UG-2** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **4** |



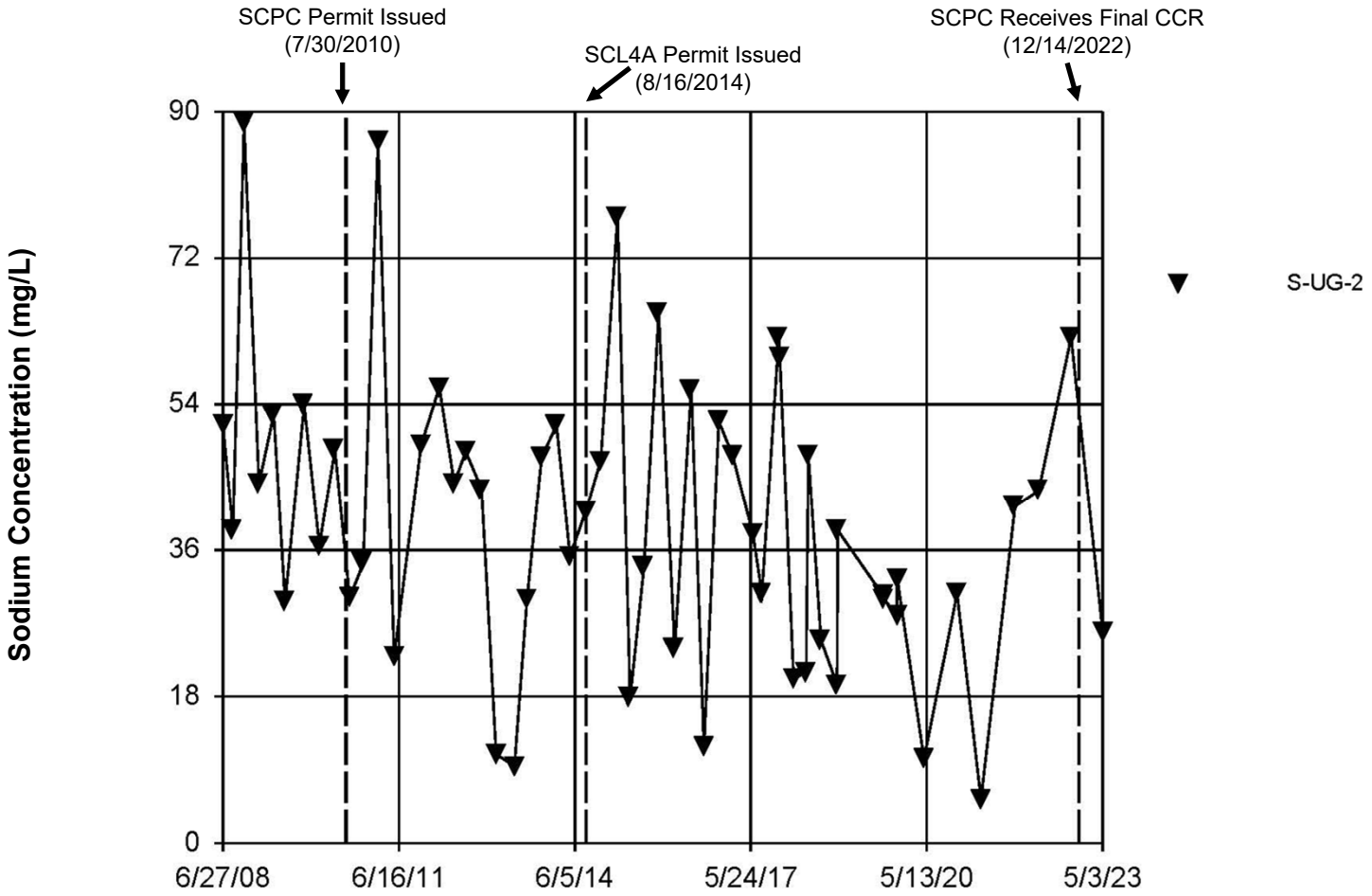

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.

| CLIENT/PROJECT | | | | TITLE |
|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Chloride Concentrations at UG-2** |
| DRAWN<br>JSI | CHECKED<br>GTM | REVIEWED<br>MNH | DATE<br>2023-11-30 | Rev No.<br>NA / JOB NO.<br>23009 / FIGURE **5** |




Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) Hollow points (points not filled in) represent non-detects.

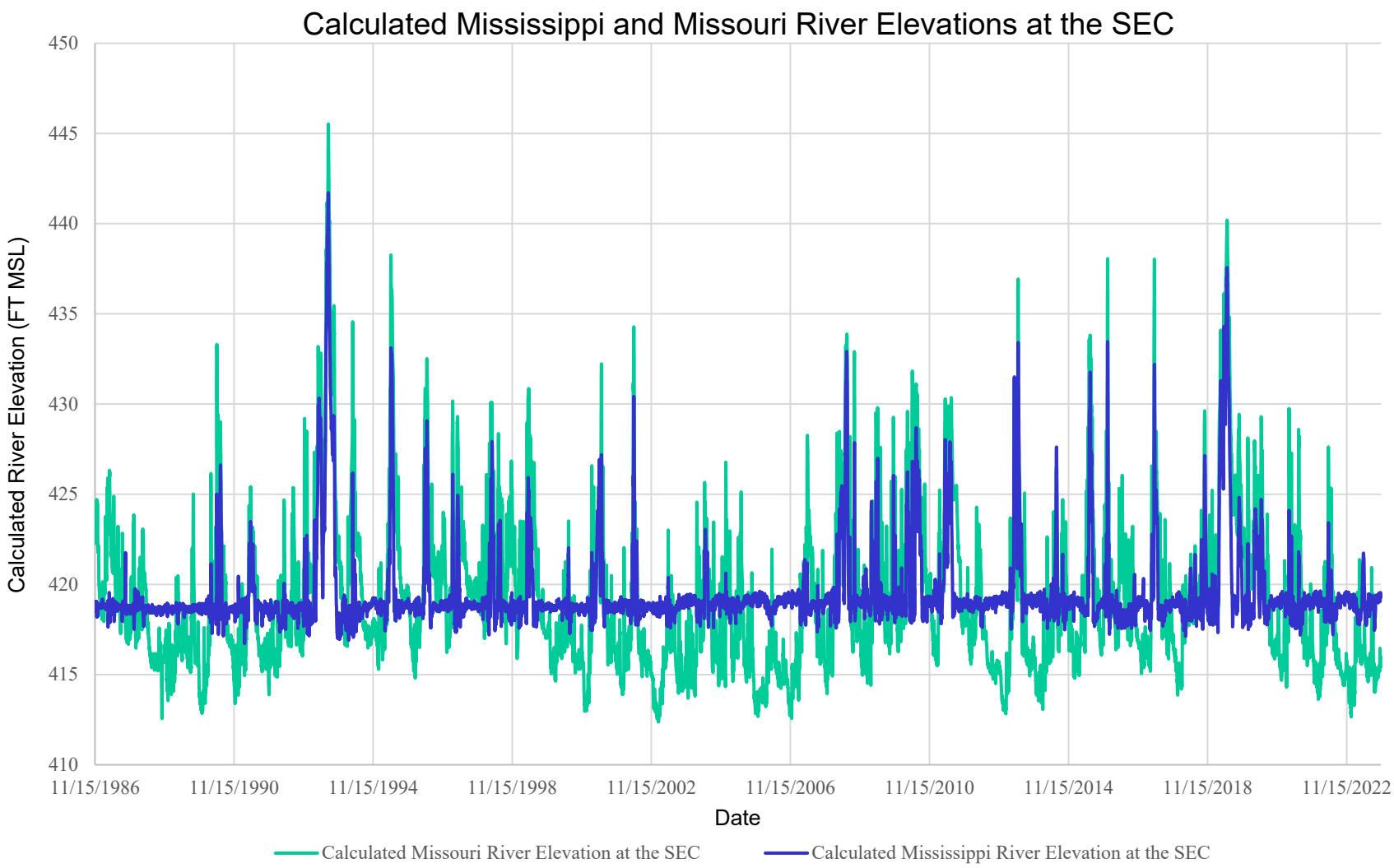
| CLIENT/PROJECT | | | | TITLE |
|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Fluoride Concentrations at UG-2** |
| DRAWN<br>JSI | CHECKED<br>GTM | REVIEWED<br>MNH | DATE<br>2023-11-30 | Rev No.<br>NA / JOB NO.<br>23009 / FIGURE<br>**6** |




Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) No UPL is calculated for sodium as it is not an Appendix III parameter.

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Sodium Concentrations at UG-2** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **7** |

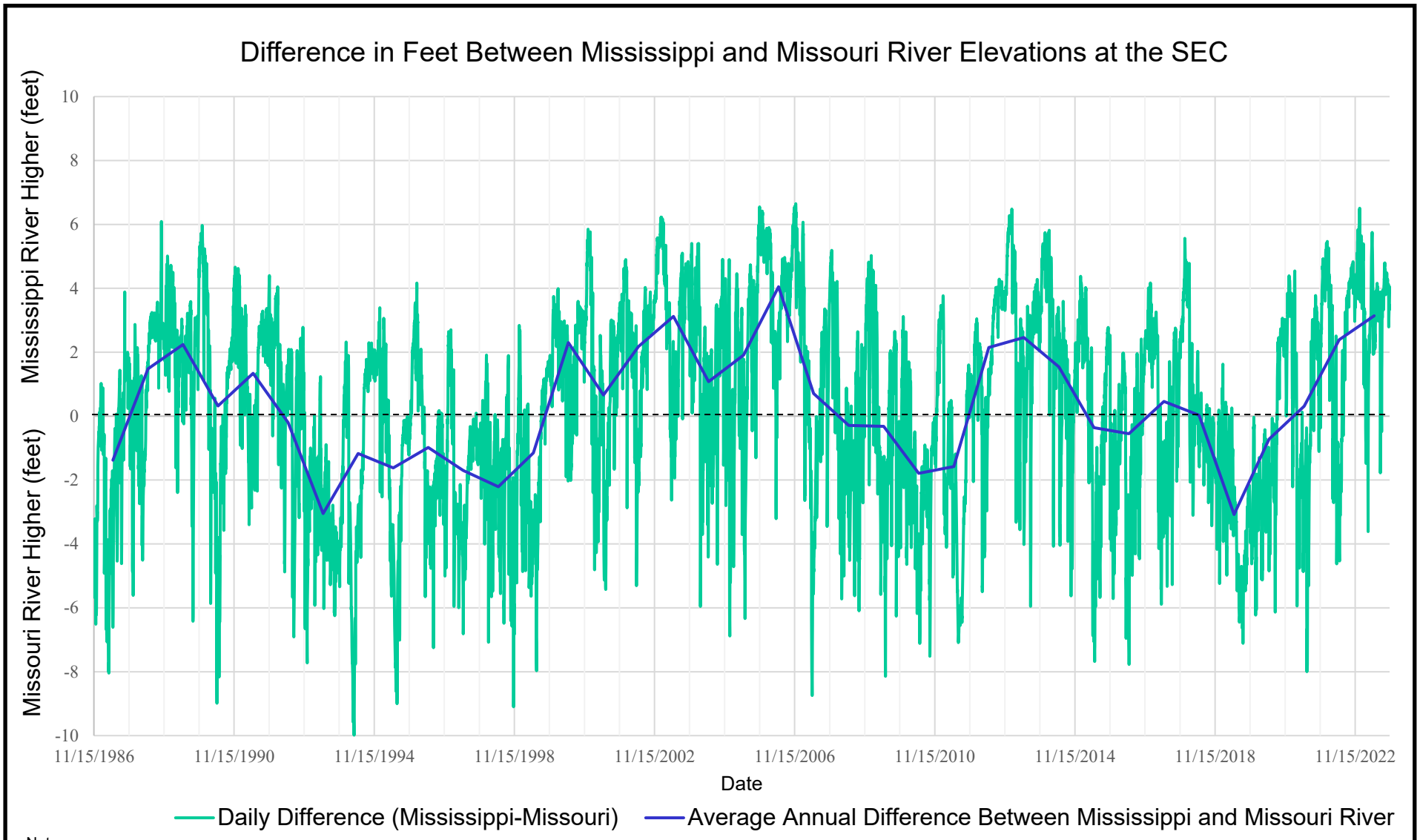
ROCKSMITH GEOENGINEERING




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

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI SIOUX ENERGY CENTER** | | | | **Calculated Mississippi and Missouri River Elevations at the SEC** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **8** |

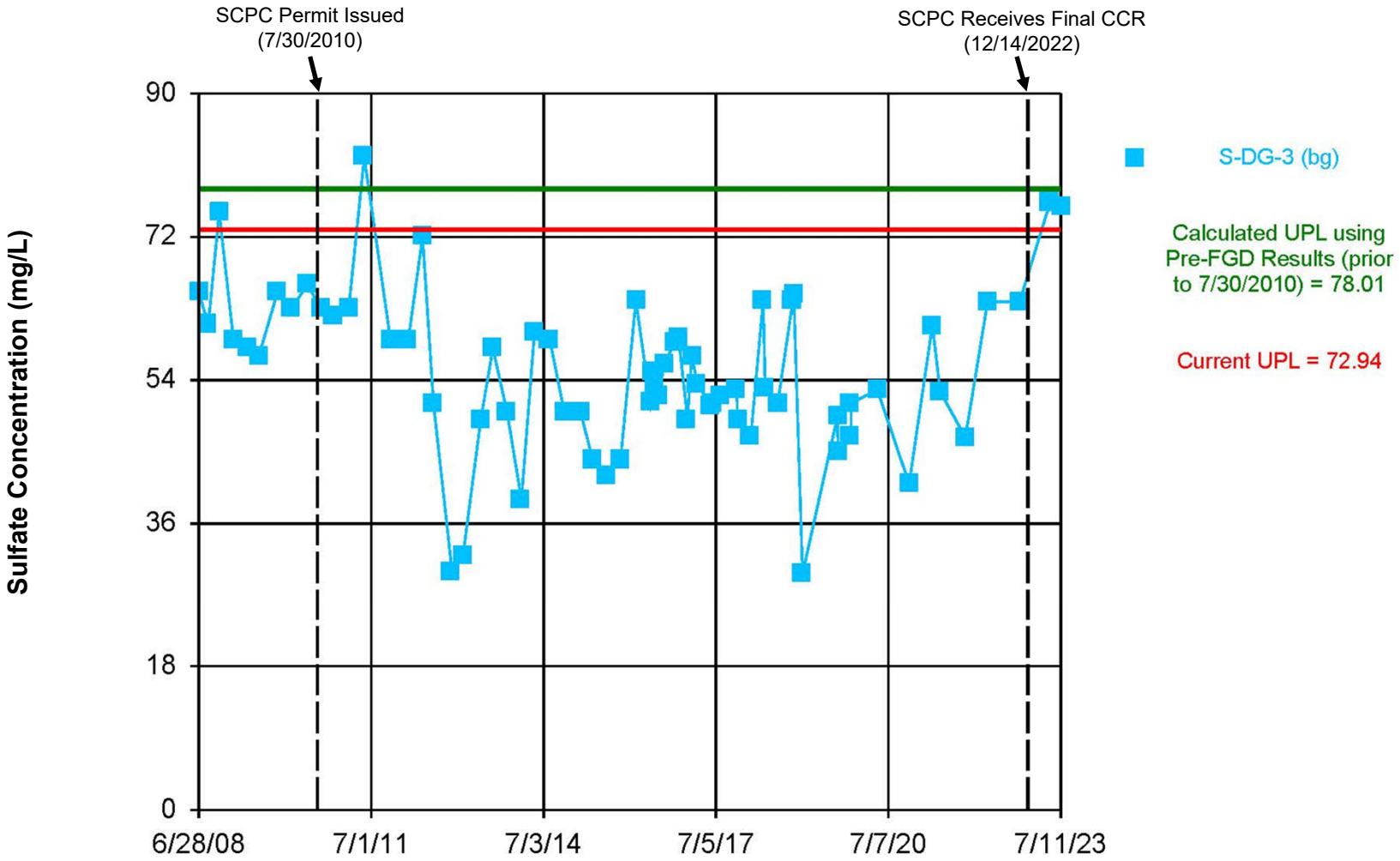
ROCKSMITH GEOENGINEERING




Notes

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

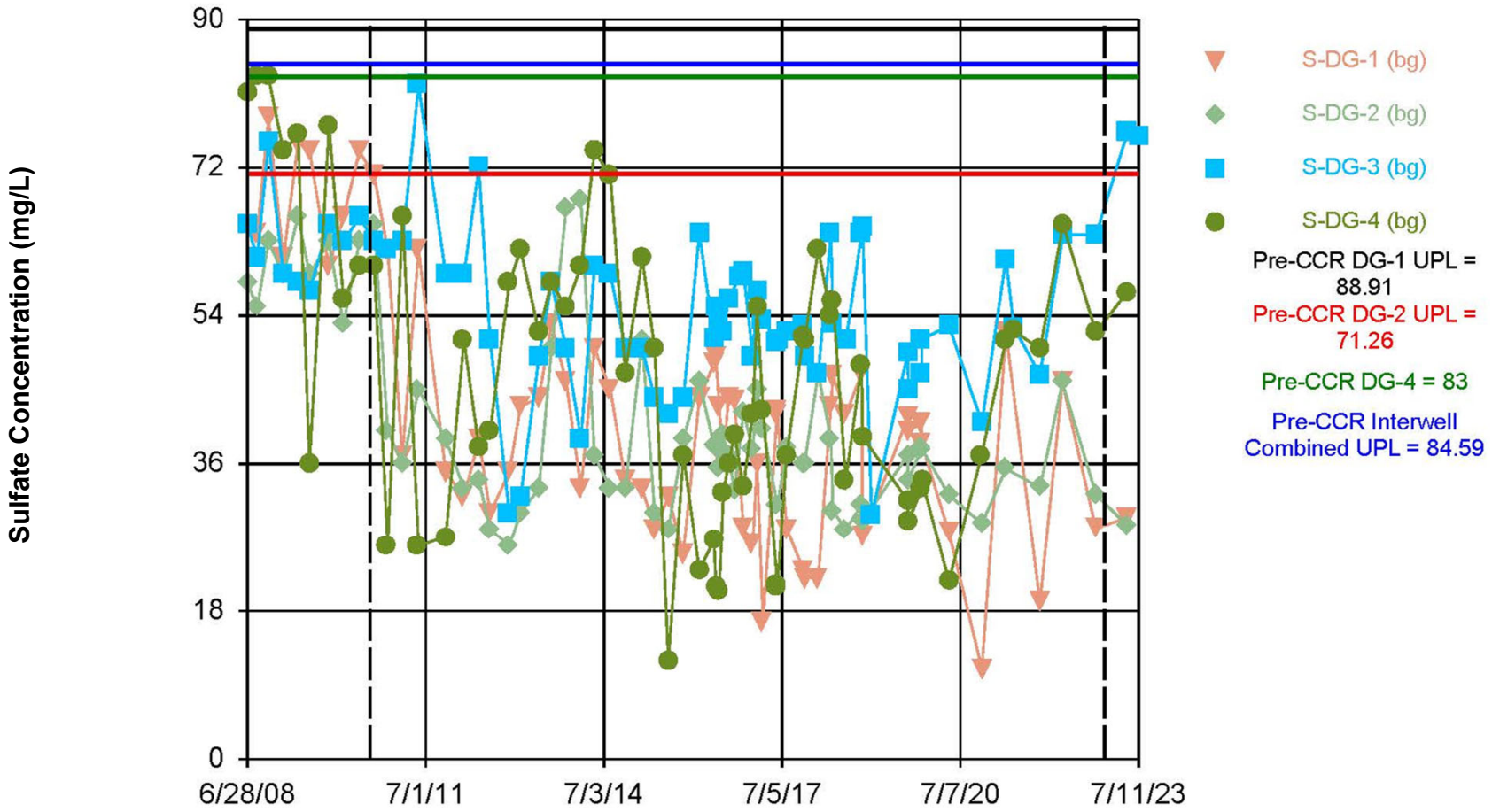
| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI SIOUX ENERGY CENTER** | | | | **Difference in Feet Between Mississippi and Missouri River Elevations at the SEC** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **9** |




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

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Sulfate Concentrations at DG-3** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **10** |

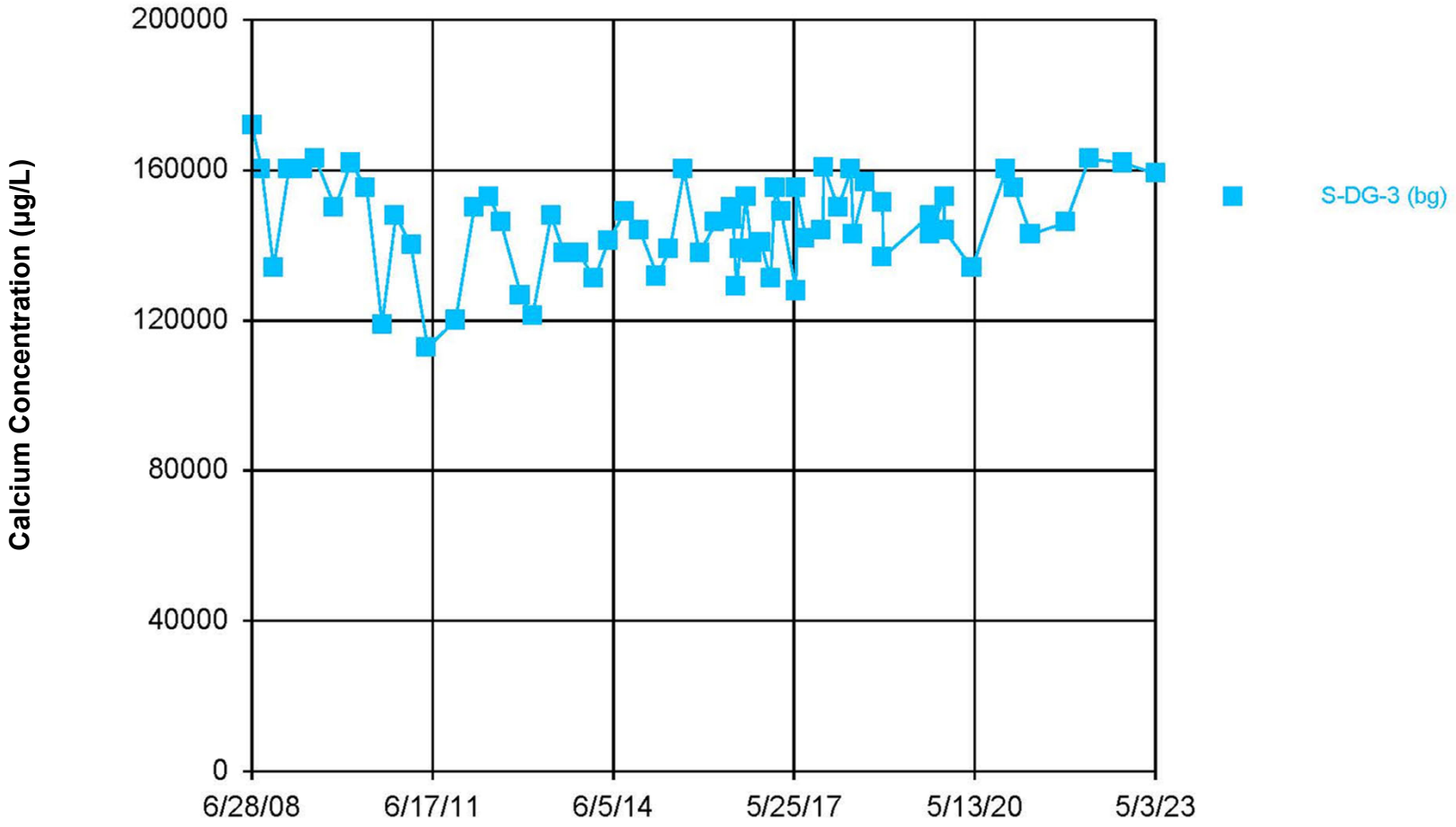
ROCKSMITH GEOENGINEERING




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

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Sulfate Concentrations at DG-1, DG-2, DG-3 and DG-4** | | |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. | JOB NO. | FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA | 23009 | **11** |

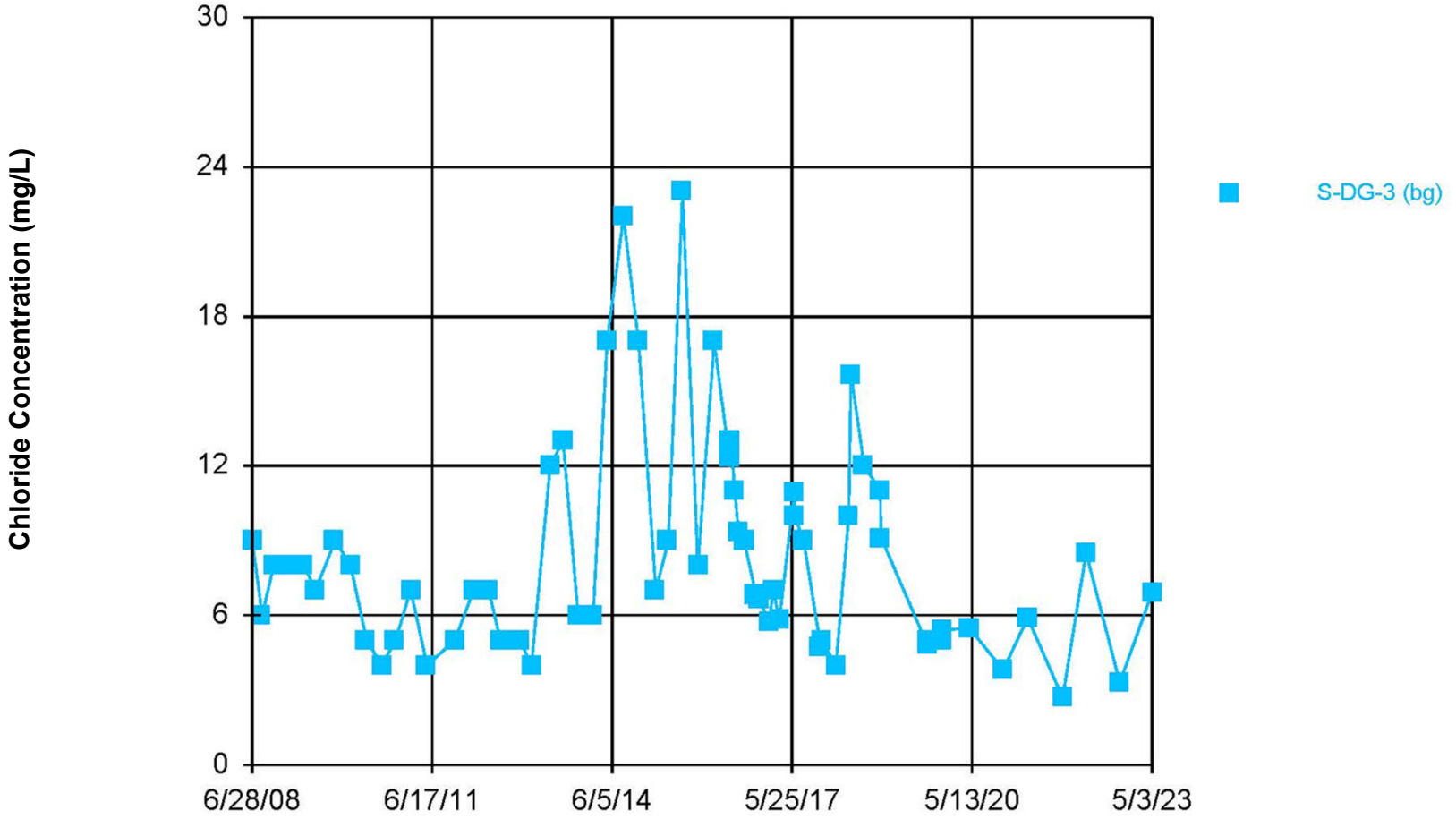
ROCKSMITH GEOENGINEERING




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

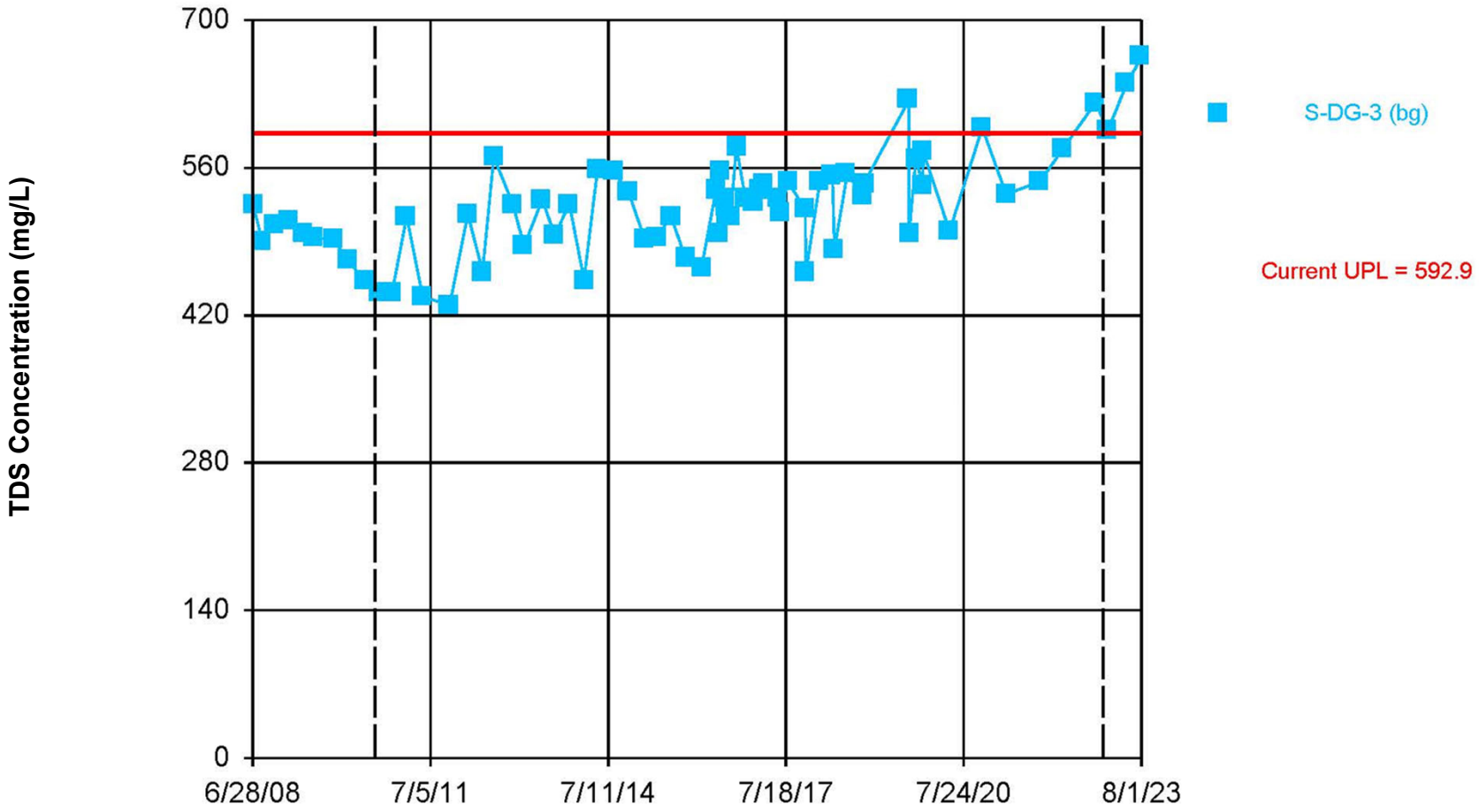
| CLIENT/PROJECT | | | | | TITLE |
|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | | **Timeseries Plot of Calcium Concentrations at DG-3** |
| DRAWN | CHECKED | REVIEWED | DATE | | Rev No. / JOB NO. / FIGURE |
| JSI | GTM | MNH | 2023-11-30 | | NA / 23009 / **12** |

ROCKSMITH GEOENGINEERING




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

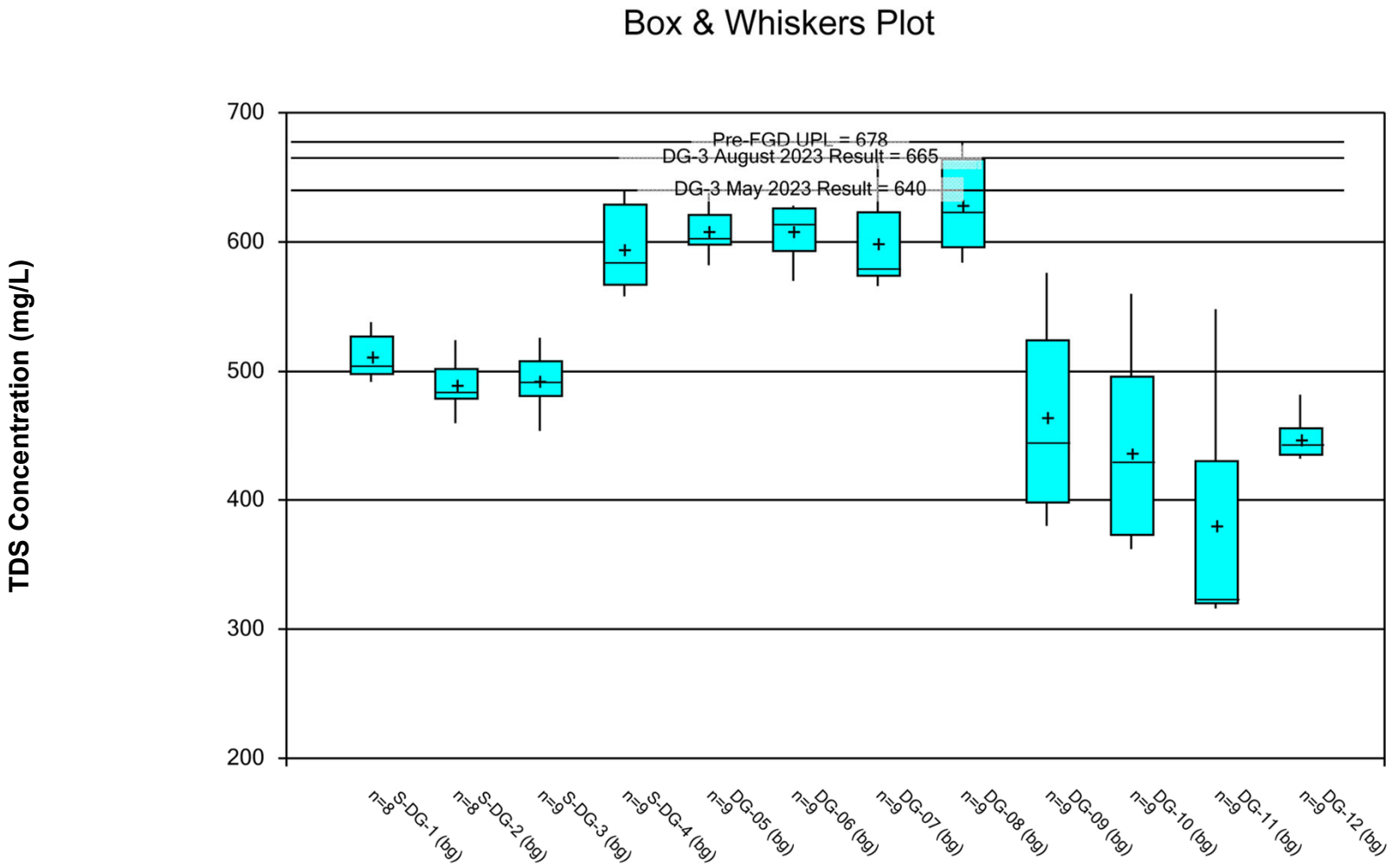
| CLIENT/PROJECT | | | | TITLE |
|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Chloride Concentrations at DG-3** |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. / JOB NO. / FIGURE |
| JSI | GTM | MNH | 2023-11-30 | NA / 23009 / **13** |




Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) TDS – Total Dissolved Solids

| CLIENT/PROJECT | | | | TITLE |
|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Timeseries Plot of Total Dissolved Solids Concentrations at DG-3** |
| DRAWN | CHECKED | REVIEWED | DATE | Rev No. / JOB NO. / FIGURE |
| JSI | GTM | MNH | 2023-12-07 | NA / 23009 / **14** |

ROCKSMITH GEOENGINEERING



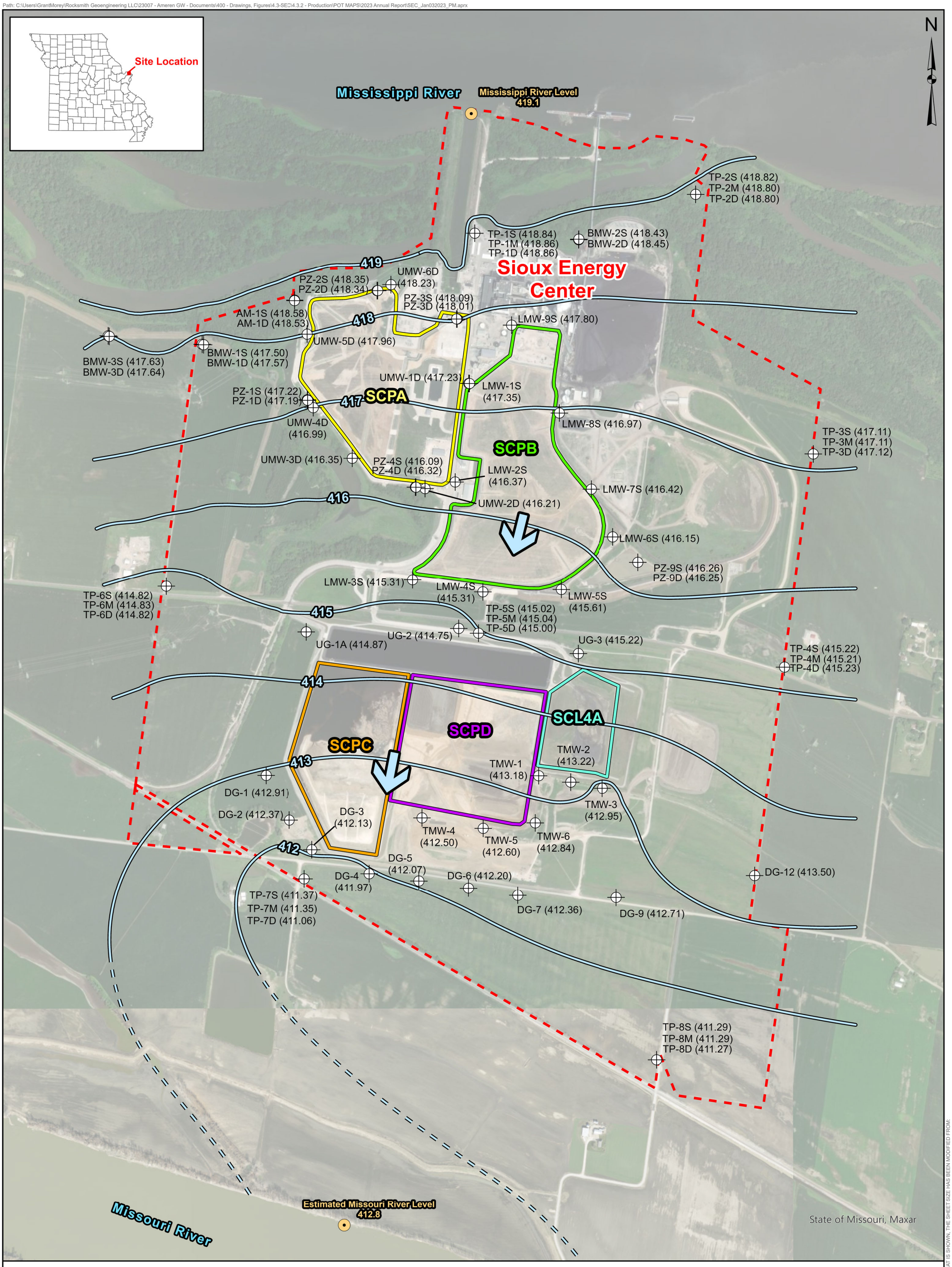

Notes
1) mg/L – Milligrams per liter.
2) UPL – Upper Prediction Limit.
3) UWL – Utility Waste Landfill.
4) CCR – Coal Combustion Residuals.
5) TDS – Total Dissolved Solids
6) FGD – Flue Gas Desulfurization

| CLIENT/PROJECT | | | | TITLE | | |
|---|---|---|---|---|---|---|
| **AMEREN MISSOURI**<br>**SIOUX ENERGY CENTER** | | | | **Box and Whisker Plot of Pre-FGD Total Dissolved Solids Concentrations** | | |
| DRAWN<br>JSI | CHECKED<br>GTM | REVIEWED<br>MNH | DATE<br>2023-12-07 | Rev No.<br>NA | JOB NO.<br>23009 | FIGURE<br>**15** |

# Appendix D

## 2023 Potentiometric Surface Maps

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_Jan032023_PM.aprx




## LEGEND

- Sioux Energy Center Property Boundary

**CCR Units**

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- 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 WSP.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.

## REFERENCES


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


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

TITLE
# JANUARY 3, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

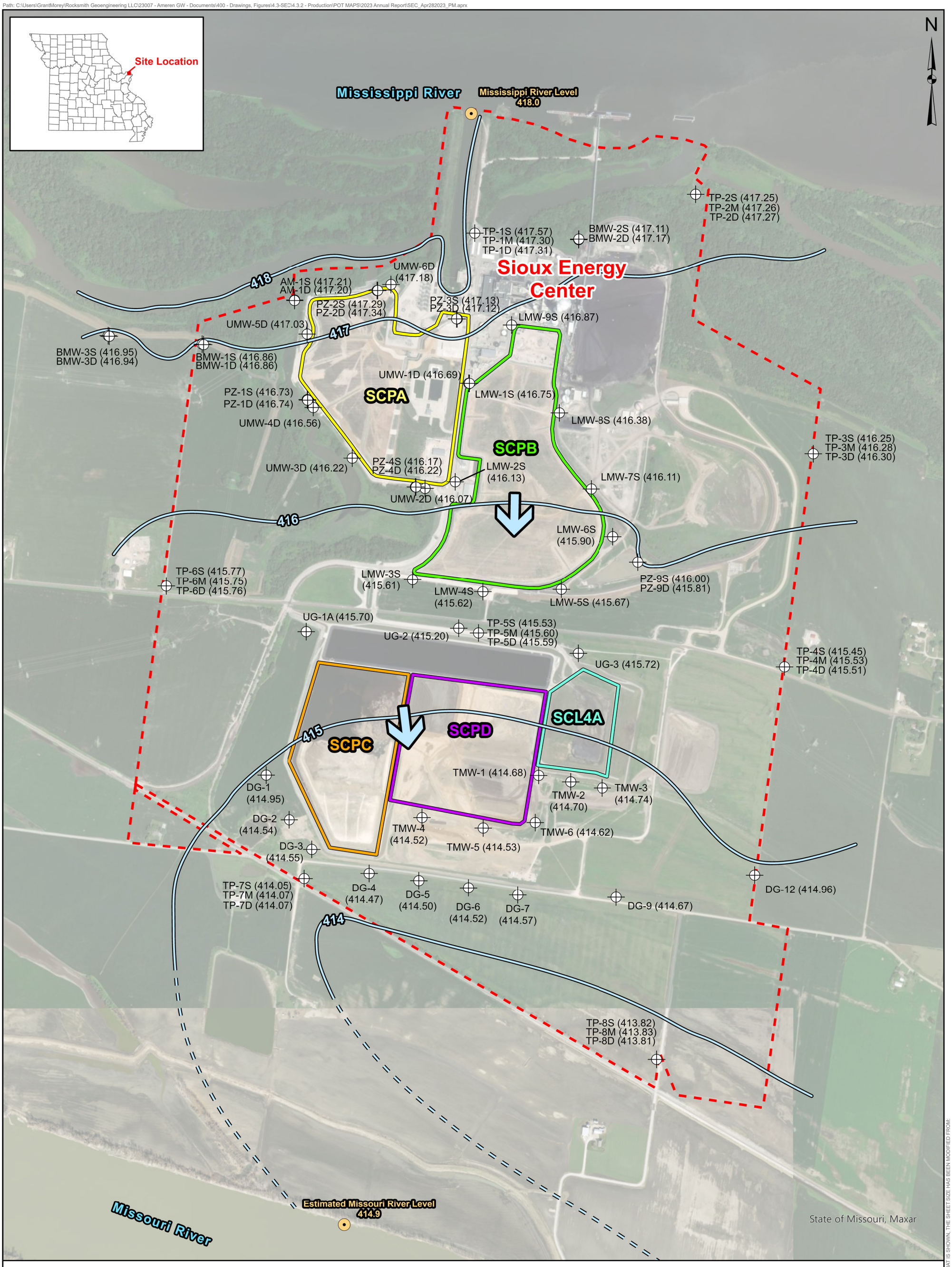
CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

| | | | |
|---|---|---|---|
| DESIGN | GTM | YYYY-MM-DD | 2023-08-21 |
| PREPARED | GTM | PROJECT No. | 23009 |
| REVIEW | JSI | FIGURE D1 | |
| APPROVED | MNH | | |

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_Apr282023_PM.aprx




## LEGEND

- Sioux Energy Center Property Boundary

**CCR Units**

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

**Groundwater Elevation Contour (FT MSL)**

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

**Ground/Surface Water Measurement Locations**

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

## NOTES

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

## REFERENCES


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


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

TITLE
# APRIL 28, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

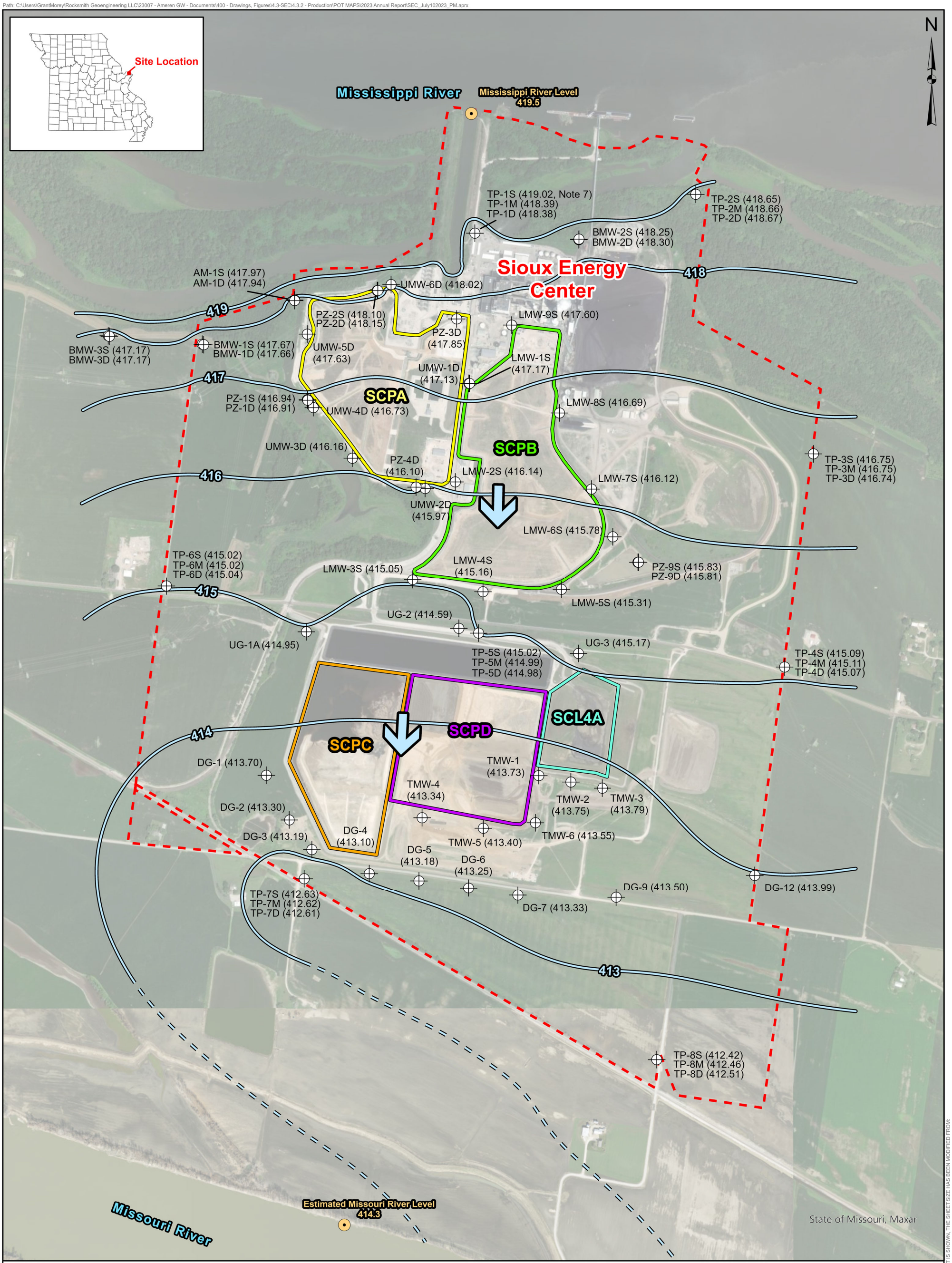
ROCKSMITH GEOENGINEERING

| | | | |
|---|---|---|---|
| DESIGN | GTM | YYYY-MM-DD | 2023-08-23 |
| PREPARED | GTM | PROJECT No. | 23009 |
| REVIEW | JSI | | |
| APPROVED | MNH | | |

**FIGURE D2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_July102023_PM.aprx




## LEGEND

- Sioux Energy Center Property Boundary

**CCR Units**

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

**Groundwater Elevation Contour (FT MSL)**

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

**Ground/Surface Water Measurement Locations**

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

## NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.
7.) TP-1S NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

## REFERENCES


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


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

TITLE
# JULY 10, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

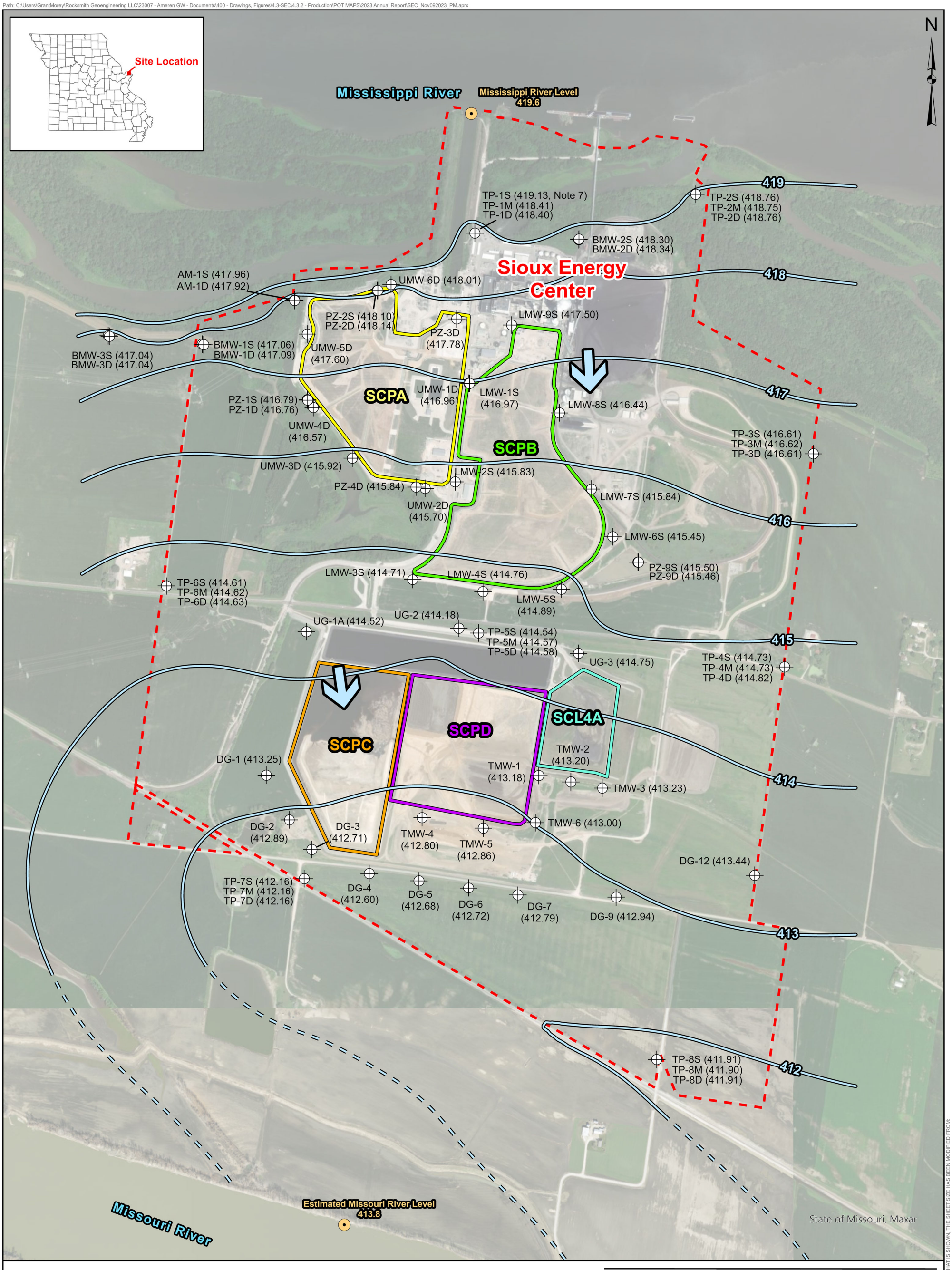
ROCKSMITH GEOENGINEERING

| | | | |
|---|---|---|---|
| DESIGN | GTM | YYYY-MM-DD | 2023-08-23 |
| PREPARED | GTM | PROJECT No. | 23009 |
| REVIEW | JSI | | |
| APPROVED | MNH | | |

**FIGURE D3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

Path: C:\Users\GrantMorey\Rocksmith Geoengineering LLC\23007 - Ameren GW - Documents\400 - Drawings, Figures\4.3-SEC\4.3.2 - Production\POT MAPS\2023 Annual Report\SEC_Nov092023_PM.aprx




## LEGEND

- Sioux Energy Center Property Boundary

**CCR Units**

- SCPA - Bottom Ash Surface Impoundment (Closed)
- SCPB - Fly Ash Surface Impoundment (Closed)
- SCPC - WFGD Surface Impoundment (Closure in Progress)
- SCL4A - Dry CCR Disposal Area
- SCPD - FGD Surface Impoundment

**Groundwater Elevation Contour (FT MSL)**

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

**Ground/Surface Water Measurement Locations**

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

## NOTES

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY ROCKSMITH.
4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
6.) FGD - FLUE GAS DESULFURIZATION.
7.) TP-1S NOT USED FOR POTENTIOMETRIC SURFACE CONTOURING.

## REFERENCES


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


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

TITLE

# NOVEMBER 9, 2023 POTENTIOMETRIC SURFACE MAP

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

CLIENT
AMEREN MISSOURI
SIOUX ENERGY CENTER

ROCKSMITH GEOENGINEERING

| | | | |
|---|---|---|---|
| DESIGN | GTM | YYYY-MM-DD | 2023-12-29 |
| PREPARED | GTM | PROJECT No. | 23009 |
| REVIEW | JSI | | |
| APPROVED | MNH | | |

**FIGURE D4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0