

# 2019 Annual Groundwater Monitoring and Corrective Action Report

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

Submitted to:

Ameren Missouri 1901 Chouteau Avenue, St. Louis, Missouri 63103

Submitted by:

#### Golder Associates Inc.

13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 +1 314 984-8800

Project No. 153-140601

January 31, 2020

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#### **1.0 INTRODUCTION**

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 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, 2019 through December 31, 2019.

#### 2.0 INSTALLATION OR DECOMMISSIONING 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 eight (8) groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2019 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 2017 Annual Groundwater Monitoring Report for the SCPC.

#### 3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the SCPC CCR Unit in 2019. **Table 1** below provides a summary of the groundwater samples collected in 2019 including the number of samples, the date of sample collection, and the monitoring program.

			Gro	undwater M	onitoring W	ells			
Sampling Event	BMW-1S	BMW-3S	UG-1A	UG-2	DG-1	DG-2	DG-3	DG-4	Monitoring
			D	ate of Samp	ole Collectio	n			Program
January 2019 Verification Sampling	-	-	-	-	1/8/2019	1/8/2019	1/8/2019	-	Detection
August 2019 Detection Monitoring Sampling	8/2/2019	8/2/2019	8/19/2019	8/19/2019	8/19/2019	8/19/2019	8/19/2019	8/19/2019	Detection
October 2019 Verification Sampling	-	-	10/2/2019	10/2/2019	-	-	10/2/2019	-	Detection
November 2019 Detection Monitoring Sampling	11/13/2019	11/13/2019	11/14/2019	11/14/2019	11/14/2019	11/14/2019	11/14/2019	11/15/2019	Detection
Total Number of Samples Collected	2	2	3	3	3	3	4	2	NA

#### Table 1 – Summary of Groundwater Sampling Dates

#### Notes:

1.) Detection Monitoring Events tested for Appendix III Parameters.

2.) Verification Sampling Events tested for Appendix III Parameters with initial exceedances.

3.) "-" No sample collected.

4.) NA - Not applicable.

#### 3.1 Detection Monitoring Program

A Detection Monitoring event was completed November 12-13, 2018. Verification Sampling and the Statistical Analysis to evaluate for Statistically Significant Increases (SSIs) for the November 2018 event were not completed until 2019 and are, therefore, included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 8, 2019 and did not verify any SSIs. **Table 2** summarizes the results of the statistical analysis of the November 2018 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

A Detection Monitoring sampling event was scheduled for May 2019, however due to flooding the event was completed August 2-19, 2019, and testing was completed for all Appendix III analytes. Statistical analysis of the data determined that there were SSIs. **Table 3** summarizes the results of the statistical analysis of the August 2019 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

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 Alternative Source Demonstration (ASD) was completed for these SSIs and is provided in **Appendix B**. This ASD demonstrates that SSIs are not caused by the SCPC CCR Unit and the SCPC CCR Unit remains in Detection Monitoring.

As outlined in the Statistical Analysis Plan for this site, updates to the statistical limits are completed once four (4) to eight (8) new sample results are available. After the statistical analysis of the August 2019 sampling event, the statistical limits used to determine an SSI were updated according to the Statistical Analysis Plan. These updated limits will be used for November 2019 and subsequent statistical analyses.

A Detection Monitoring event was completed November 13-15, 2019, and testing was performed for all Appendix III analytes. Statistical analyses to evaluate for SSIs in the November 2019 data were not completed in 2019 and the results will be provided in the 2020 Annual Report. **Table 4** summarizes the results of the November 2019 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

#### 3.2 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 found in **Appendix C**. 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, since the alluvial aquifer is hydraulically connected to these water bodies. Groundwater in the alluvial aquifer will generally flow from the higher of the two rivers toward the lower elevation river. The SCPA Surface Impoundment and Poeling Lake also locally affect water levels and flow directions. 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 were estimated for the alluvial aquifer wells at the SEC using commercially available software. Results from this assessment indicate that while groundwater flow direction is

variable, the overall net groundwater flow at the SEC was toward the northeast but ranged from north to south. Horizontal gradients calculated by the program range from 0.0001 to 0.001 feet/foot with an estimated net annual groundwater velocity of approximately four (4) feet per year.

#### 4.0 STATUS OF THE GROUNDWATER MONITORING PROGRAM

The SCPC remains in Detection Monitoring. Section 5.0 provides a discussion of the activities planned for 2020.

#### 4.1 Sampling Issues

Detection Monitoring for the SEC was planned for May 2019. However, from approximately March to July 2019, some of the monitoring wells at the SEC were under water due flooding of the Mississippi and Missouri Rivers. This caused a delay in the planned sampling dates for the SCPC. On July 15-17, 2019, Golder performed post-flood monitoring well inspections at the SEC and found that at the SCPC BMW-1S, BMW-3S, DG-4 and UG-1A had been impacted by the flood. On July 23, 2019, Golder re-developed BMW-1S and BMW-3S to remove floodwater impacts to the wells prior to any future groundwater elevation measurements or groundwater samples being collected. After successful re-development, BMW-1S and BMW-3S were returned to service. Gredell Engineering Resources re-developed wells used for the UWL permitting at the SEC August 12-16, 2019. After successful re-development DG-4 and UG-1A were returned to service.

No other notable sampling issues were encountered in 2019.

#### 5.0 ACTIVITIES PLANNED FOR 2020

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2020. Statistical analysis of the November 2019 Detection Monitoring data will be completed in 2020 and included in the 2020 Annual Report.

## Tables

# Table 2November 2018 Detection Monitoring ResultsSCPC Surface ImpoundmentSioux Energy Center, St. Charles County, MO

		BACKG	ROUND					GROU	NDWATER M	ONITORING	WELLS				
ANALYTE	UNITS	BMW-1S	BMW-3S	Prediction Limit UG-1A	UG-1A	Prediction Limit UG-2	UG-2	Prediction Limit DG-1	DG-1	Prediction Limit DG-2	DG-2	Prediction Limit DG-3	DG-3	Prediction Limit DG-4	DG-4
November 2018 Detection Monitoring Event															
DATE	NA	11/12/2018	11/12/2018	NA	11/13/2018	NA	11/13/2018	NA	11/13/2018	NA	11/13/2018	NA	11/13/2018	NA	11/13/2018
рН	SU	7.46	7.49	6.294-7.616	7.00	6.031-7.969	6.76	6.759-7.323	6.11	6.73-7.482	6.20	6.156-7.702	6.12	6.291-7.62	7.05
BORON, TOTAL	μg/L	72.9 J	61.5 J	362.5	145	234.6	145	122.5	125	119.3	114	115.1	108	DQR	73.2 J
CALCIUM, TOTAL	μg/L	157,000	124,000	164,715	116,000	133,251	105,000	146,584	129,000	142,779	122,000	159,563	137,000	147,361	121,000
CHLORIDE, TOTAL	mg/L	6.7	10.1	131.6	65.4	125.3	24.4	9.962	8.6	9.817	6.9	16.08	9.1	115.1	80.2
FLUORIDE, TOTAL	mg/L	0.34	0.36	0.3822	ND	0.24	ND	0.3844	ND	0.4365	ND	0.4619	ND	0.37	ND
SULFATE, TOTAL	mg/L	28.8	25.6	103.2	65.9	101.6	17.7	66.1	27.1	47.44	29.0	61.41	64.7	57.15	39.3
TOTAL DISSOLVED SOLIDS	mg/L	556	436	818.8	549	613.7	607 J	569.1	511	521.6	470	580	545	698.9	611
						January 20	019 Verificati	on Sampling							
DATE	NA								1/8/2019		1/8/2019		1/8/2019		
рН	SU								6.97		7.00		7.14		
BORON, TOTAL	μg/L								99.7 J						
CALCIUM, TOTAL	μg/L														
CHLORIDE, TOTAL	mg/L														
FLUORIDE, TOTAL	mg/L														
SULFATE, TOTAL	mg/L												29.7		
TOTAL DISSOLVED SOLIDS	mg/L														

NOTES:

1. Unit Abbreviations:  $\mu g/L$  - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

2. J - Result is an estimated value.

3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.

4. NA - Not applicable.

5. Prediction Limits calculated using Sanitas Software.

6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).

8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).

9. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: RJF Checked By: KAB Reviewed By: CMR

# Table 3August 2019 Detection Monitoring ResultsSCPC Surface ImpoundmentSioux Energy Center, St. Charles County, MO

		BACKG	ROUND					GROU	NDWATER M	IONITORING	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
	August 2019 Detection Monitoring Event														
DATE	NA	8/2/2019	8/2/2019	NA	8/19/2019	NA	8/19/2019	NA	8/19/2019	NA	8/19/2019	NA	8/19/2019	NA	8/19/2019
рН	SU	6.9	7.5	6.294-7.616	6.55	6.031-7.969	6.65	6.759-7.323	6.77	6.73-7.482	6.83	6.156-7.702	6.76	6.291-7.62	6.64
BORON, TOTAL	μg/L	ND	ND	362.5	270	234.6	144	122.5	106	119.3	104	115.1	95.1 J	DQR	61.1 J
CALCIUM, TOTAL	μg/L	149,000	122,000	164,715	177,000	133,251	116,000	146,584	135,000	142,779	133,000	159,563	148,000	147,361	136,000
CHLORIDE, TOTAL	mg/L	8.8	10.6	131.6	145	125.3	30.0	9.962	6.2	9.817	8.2	16.08	4.8	115.1	103.0
FLUORIDE, TOTAL	mg/L	0.31	0.35	0.3822	0.28	0.24	0.25	0.3844	0.34	0.4365	0.38	0.4619	0.37	0.37	0.32
SULFATE, TOTAL	mg/L	34.1	25.3	103.2	57.7	101.6	45.2	66.1	41.7	47.44	37.1	61.41	49.5	57.15	31.5
TOTAL DISSOLVED SOLIDS	mg/L	548	452	818.8	785	613.7	519	569.1	503	521.6	511	580	624	698.9	671
						October 2019	Verificatior	n Sampling Ev	ent						
DATE	NA				10/2/2019		10/2/2019						10/2/2019		
рН	SU				6.82		6.83						6.82		
BORON, TOTAL	μg/L														
CALCIUM, TOTAL	μg/L				166,600										
CHLORIDE, TOTAL	mg/L				140										
FLUORIDE, TOTAL	mg/L						0.30								
SULFATE, TOTAL	mg/L														
TOTAL DISSOLVED SOLIDS	mg/L												569		

NOTES:

1. Unit Abbreviations:  $\mu$ g/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

2. J - Result is an estimated value.

3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.

4. NA - Not applicable.

5. Prediction Limits calculated using Sanitas Software.

6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).

8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).

9. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: RJF Checked By: KAB Reviewed By: CMR

#### Table 4 November 2019 Detection Monitoring Results SCPC Surface Impoundment Sioux Energy Center, St. Charles County, MO

		BACKG	ROUND		GROL	JNDWATER M	ONITORING V	WELLS			
ANALYTE	UNITS	BMW-1S	BMW-3S	UG-1A	UG-1A UG-2		DG-2	DG-3	DG-4		
November 2019 Detection Monitoring Event											
DATE	NA	11/13/2019	11/13/2019	11/14/2019	11/14/2019	11/14/2019	11/14/2019	11/14/2019	11/15/2019		
рН	SU	6.88	7.13	6.85	7.09	7.06	6.61	6.88	6.97		
BORON, TOTAL	μg/L	118	80.1 J	239	144	111	100	93.1 J	71.0 J		
CALCIUM, TOTAL	μg/L	143,000 J	102,000	166,000	115,000	135,000	133,000	144,000	138,000		
CHLORIDE, TOTAL	mg/L	6.4	7.6	118	27.8	6.0	7.4	5.4	96.9 J		
FLUORIDE, TOTAL	mg/L	0.28	0.23	0.29	0.24	0.33	0.39	0.42	0.30		
SULFATE, TOTAL	mg/L	26.5	34.4	53	43.8	38.4	37.8	51.1	33.9		
TOTAL DISSOLVED SOLIDS	mg/L	551	418	739	480	524	512	576	628		

NOTES:

1. Unit Abbreviations:  $\mu$ g/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.

2. J - Result is an estimated value.

3. NA - Not applicable.

Prepared By: TJG Checked By: KAB Reviewed By: CMR

## Figures



LEGEND							
1 <b>2</b> 1	Sioux	Energy Cent	ter Pro	perty Bound	ary		
	UWLF	Perimeter Fei	nce				
	SCPC	- WFGD Dis	sposal	Area			
		Recycle Pon					
		•				J	
		vater Mor C CCR Ru					
	SCPC	Monitoring V	Well				
$\oplus$	Backg	round Monito	oring V	Vell			
1120000							
0		1,000		2,000	3,00	0	
0		1,000		2,000			
		1,000		2,000	3,000		
<b>NOTE(S)</b> 1.) ALL BO	OUNDARI	ES AND LOCATIONS	IS ARE AP				
NOTE(S) 1.) ALL BO 2.) UWL -	OUNDARI UTILITY V			PROXIMATE.			
NOTE(S) 1.) ALL B( 2.) UWL - 3.) WFGD	OUNDARI UTILITY V - WET FL	ES AND LOCATIONS WASTE LANDFILL. LUE GAS DESULFUF	RIZATION	PROXIMATE.	Fee	t	
NOTE(S) 1.) ALL B( 2.) UWL - 3.) WFGD REFEREN 1.) AMER 2011.	OUNDARI UTILITY V - WET FL NCE(S) REN MISS	ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC	RIZATION	PROXIMATE. ER, SIOUX PROPE	Fee	t OL MAP, FEE	BRUAP
NOTE(S) 1.) ALL B( 2.) UWL - 3.) WFGD REFEREN 1.) AMER 2011.	OUNDARI UTILITY V - WET FL NCE(S) REN MISS	ES AND LOCATIONS WASTE LANDFILL. LUE GAS DESULFUF	RIZATION	PROXIMATE. ER, SIOUX PROPE	Fee	t OL MAP, FEE	BRUAP
NOTE(S) 1.) ALL BC 2.) UWL - 3.) WFGD REFEREN 1.) AMER 2011. 2.) COOF CLIENT	OUNDARII UTILITY V O - WET FL NCE(S) REN MISSO RDINATE S	ES AND LOCATIONS WASTE LANDFILL LUE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983	RIZATION	PROXIMATE. ER, SIOUX PROPE	Fee	COL MAP, FEE 401 FEET.	
NOTE(5) 1.) ALL B( 2.) UWL - 3.) WFGD 7.1 ANFGD 7.1 ANFGD 2.) COOF CLIENT AMER	OUNDARII UTILITY V - WET FL NCE(S) REN MISSI RDINATE S	ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC	RIZATION GY CENTI 3 STATE P	PROXIMATE. ER, SIOUX PROPE	Fee	COL MAP, FEE 401 FEET.	BRUAP
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NOTE(S) 1.) ALL BR 2.) UWL- 3.) WFGD REFEREN 1.) AMER 2011. 2.) COOP CLIENT AMER SIOUX PROJECT GROU	OUNDARII UTILITY V - WET FL NCE(S) REN MISSO RDINATE S EN MIS EN MIS	ES AND LOCATIONS WASTE LANDFILL LUE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI	RIZATION GY CENTI 3 STATE P	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E	Fee	COL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL-2 ) UWL-2 3) WFGD 3) WFGD 3) WFGD 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU	OUNDARI UTILITY V - WET FL NCE(S) REN MISS RDINATE S EN MISS (ENER T NDWA	ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E	Fee RTY CONTR AST FIPS 2,	OL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL - 2) UWL - 2) UWL - 2) UWL - 2) UWL - 2011. 2) COOF 2011. 2) COOF 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU	OUNDARI UTILITY V - WET FL NCE(S) REN MISS RDINATE S EN MISS (ENER T NDWA	ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER NTER MONITC	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E	Fee RTY CONTR AST FIPS 2,	OL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL - 2) UWL - 2) UWL - 2) UWL - 2) UWL - 2011. 2) COOF 2011. 2) COOF 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU		ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER NTER MONITC	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E PROGRAM	Fee RTY CONTR AST FIPS 2,	ROL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL- 2) UWL- 3) WFGD 3) WFGD 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU	OUNDARII UTILITY V - WET FL NCE(5) REN MISS RDINATE S EN MISS (ENEF T NDWA LOCAT TIONS	ES AND LOCATIONS MASTE LANDFILL LUE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER ATER MONITC	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E PROGRAM AND MONITO VYYY-MM-DD DESIGNED	Fee RTY CONTR AST FIPS 2, RING W 2020- JSI	ROL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL- 2) UWL- 3) WFGD 3) WFGD 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU	OUNDARII UTILITY V - WET FL NCE(5) REN MISS RDINATE S EN MISS (ENEF T NDWA LOCAT TIONS	ES AND LOCATIONS WASTE LANDFILL. UE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER NTER MONITC	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E PROGRAM AND MONITO VYYY-MM-DD DESIGNED PREPARED	Fee RTY CONTR AST FIPS 2, RING W 2020- JSI RJF	ROL MAP, FEE 401 FEET.	
NOTE(S) 1) ALL BC 2) UWL- 2) UWL- 3) WFGD 3) WFGD 2011. 2) COOF CLIENT AMER SIOUX PROJECT GROU	OUNDARII UTILITY V - WET FL NCE(5) REN MISS RDINATE S EN MISS (ENEF T NDWA LOCAT TIONS	ES AND LOCATIONS MASTE LANDFILL LUE GAS DESULFUF OURI SIOUX ENERC SYSTEM: NAD 1983 SSOURI RGY CENTER ATER MONITC	RIZATION GY CENTI 3 STATE P R DRING	PROXIMATE. ER, SIOUX PROPE LANE MISSOURI E PROGRAM AND MONITO VYYY-MM-DD DESIGNED	Fee RTY CONTR AST FIPS 2, RING W 2020- JSI	ROL MAP, FEE 401 FEET.	

APPENDIX A

# Laboratory Analytical Data



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

January 10, 2019

Mark Haddock Golder Associates 820 S. Main St Suite 100 Saint Charles, MO 63301

RE: Project: SCPC GW SAMPLING Pace Project No.: 60291371

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on January 09, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Jami Church

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

Enclosures

cc: Ryan Feldmann, Golder Jeffrey Ingram, Golder Associates Eric Schneider, Golder Associates





#### CERTIFICATIONS

Project: SCPC GW SAMPLING

Pace Project No.: 60291371

#### **Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Certification Number: 10090 Arkansas Drinking Water WY STR Certification #: 2456.01 Arkansas Certification #: 18-016-0 Arkansas Drinking Water Illinois Certification #: 004455 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 / E10426 Louisiana Certification #: 03055 Nevada Certification #: KS000212018-1 Oklahoma Certification #: 9205/9935 Texas Certification #: T104704407-18-11 Utah Certification #: KS000212018-8 Kansas Field Laboratory Accreditation: # E-92587 Missouri Certification: 10070 Missouri Certification Number: 10090



#### SAMPLE SUMMARY

Project: SCPC GW SAMPLING

Pace Project No.: 60291371

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60291371001	S-D6-1	Water	01/08/19 09:45	01/09/19 03:00
60291371002	S-D6-3	Water	01/08/19 09:50	01/09/19 03:00



#### SAMPLE ANALYTE COUNT

Project: SCPC GW SAMPLING Pace Project No.: 60291371

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60291371001	S-D6-1	EPA 200.7	CTR	1	PASI-K
60291371002	S-D6-3	EPA 300.0	MGS	1	PASI-K



Project: SCPC GW SAMPLING

Pace Project No.: 60291371

Sample: S-D6-1	Lab ID:	Lab ID: 60291371001		Collected: 01/08/19 09:45			/09/19 03:00	Matrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Analytical Method: EPA 20		aration Met	hod: EPA	200.7			
Boron	99.7J	ug/L	100	12.5	1	01/09/19 15:16	01/10/19 10:4	2 7440-42-8	



Project: SCPC GW SAMPLING

Pace Project No.: 60291371

Sample: S-D6-3 Lab ID: 60291371002			Collected	d: 01/08/19	9 09:50	Received: 01	/09/19 03:00 Ma	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
300.0 IC Anions 28 Days	0.00									
Sulfate	29.7	mg/L	5.0	1.2	5		01/10/19 11:31	14808-79-8	M1	



#### **QUALITY CONTROL DATA**

Project: Pace Project No.:	SCPC GW SAMPL 60291371	_ING										
QC Batch:	563906		Analys	is Method:	: E	PA 200.7						
QC Batch Method:	EPA 200.7		-	is Descript		00.7 Metals	, Total					
Associated Lab Sar	nples: 60291371	001										
METHOD BLANK:	2313489		N	Aatrix: Wa	ter							
Associated Lab Sar	nples: 60291371	001										
			Blank	R	eporting							
Parar	neter	Units	Resul	t	Limit	MDL		Analyzed	Qua	alifiers		
Boron		ug/L	<	<12.5	100		12.5 0	1/10/19 10:	39			
LABORATORY CO	NTROL SAMPLE:	2313490										
			Spike	LCS	6	LCS	% F	Rec				
Parar	neter	Units	Conc.	Resu	ılt	% Rec	Lim	iits (	Qualifiers			
Boron		ug/L	1000		944	94		85-115		_		
MATRIX SPIKE & N	IATRIX SPIKE DUP	LICATE: 23134	91		2313492							
			MS	MSD								
		60291374003	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Paramete	er Uni	ts Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/	L 382	1000	1000	1350	1330	ę	97 9	5 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.



#### **QUALITY CONTROL DATA**

Project:	SCPC GW SAMF	LING											
Pace Project No.:	60291371												
QC Batch:	564071		Analys	sis Method	: E	EPA 300.0							
QC Batch Method:	EPA 300.0		Analys	sis Descrip	tion: 3	800.0 IC Anio	ons						
Associated Lab Sar	mples: 6029137	1002											
METHOD BLANK:	2314235		١	Matrix: Wa	iter								
Associated Lab Sar	mples: 6029137 <sup>2</sup>	1002											
			Blank		Reporting								
Para	meter	Units	Resul	t	Limit	MDL		Analyze	ed	Qua	alifiers		
Sulfate		mg/L		<0.24	1.0	)	0.24	01/10/19 (	)9:48	5			
LABORATORY CO	NTROL SAMPLE:	2314236											
			Spike	LCS	3	LCS	%	Rec					
Parar	meter	Units	Conc.	Resu	ult	% Rec	Li	imits	Qu	alifiers			
Sulfate		mg/L	5		4.9	98		90-110			_		
		PLICATE: 23142	237		2314238								
MATRIX SPIKE & M	MATRIX SPIKE DU	LIOAIL. 20142											
MATRIX SPIKE & M	MATRIX SPIKE DU		MS	MSD									
		60291371002	Spike	Spike	MS	MSD	MS	-		% Rec		Max	
MATRIX SPIKE & M		60291371002	-	-	MS Result	MSD Result	MS % Re	-		% Rec Limits	RPD	Max RPD	Qual

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.



#### QUALIFIERS

#### Project: SCPC GW SAMPLING

Pace Project No.: 60291371

#### 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.

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

TNI - The NELAC Institute.

#### LABORATORIES

PASI-K Pace Analytical Services - Kansas City

#### ANALYTE QUALIFIERS

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



#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: SCPC GW SAMPLING Pace Project No.: 60291371

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60291371001	S-D6-1	EPA 200.7	563906	EPA 200.7	563987
60291371002	S-D6-3	EPA 300.0	564071		

	5-5	
Face Analytical Sample Condition U	,	WO#:60291371
Tracking #:       Pac         Custody Seal on Cooler/Box Present: Yes       No □         Packing Material:       Bubble Wrap □       Bubble Bags □	e Shipping Label Used Seals intact: Yes I Foam □ Ice: Wet Blue Non	No  None  Other  Date and initials of person
Chain of Custody present:	Pres DNO DN/A	
Chain of Custody relinguished:	ZYes DNo DN/A	
Samples arrived within holding time:	ZYes DNo DN/A	
Short Hold Time analyses (<72hr):	DYes ANO DN/A	
Rush Turn Around Time requested:	Pres DNO DN/A	
Sufficient volume:	VYes DNO DN/A	
Correct containers used:	Øyes INO IN/A	
Pace containers used:	/ Øyes ⊡No □N/A	
Containers intact:	XYes No N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	DYes DNO DINIA	
Filtered volume received for dissolved tests?	DYes INO DN/A	
Sample labels match COC: Date / time / ID / analyses	ZYes DNo DN/A	
Samples contain multiple phases? Matrix: WT	BYes DNO DN/A	
Containers requiring pH preservation in compliance? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	ØYes □No □N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip tums dark? (Record only)	DYes DNo	
Potassium iodide test strip turns blue/purple? (Preserve)	OYes No	
Trip Blank present:	DYes DNo ZN/A	
Headspace in VOA vials ( >6mm):	TYes No N/A	
Samples from USDA Regulated Area: State:	DYes DNo DN/A	
Additional labels attached to 5035A / TX1005 vials in the field Client Notification/ Resolution: Copy COC	to Client? Y / N	Field Data Required? Y / N
Person Contacted: Date/ Comments/ Resolution:	nme:	
Project Manager Review:	Dat	1/9/19

Pace Analytical 0

# CHAIN-OF-CUSTODY / Analytical Request Document

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

-	TORY ACTION	RY AGENCY	ES 7 GROUND WATER	LUST L RCRA COTHER	Site Location MC	STATE: MU STATE:	Requested Analysis Filtered (YIN)		(N\Y) ər	ninold) Isubise			)									DATE TIME SAMPLE CONDITIONS	1 0.50 0.9 1	(N paje	۰ ni qi avived د مار (۲/۷) هور (۲/	9092 1000
Invoice Information: Attention:		/ Name:	Address.	Pace Quote Balkventre	Page Project Jamie Church	Pace Profile # 9285	Requested Ar	Preservatives		0H thanol thanol ref ron foride loride oride		• -	7 7										A. A. P. Co		6	DATE Signed
Ir Required Project Information: Ir Report To: Mark Haddock (mhaddock@golder.com) A		Copy To: Jeffrey Ingram		Purchase Order No.		10 en company	2000, JOHI 241	(Jîsi	Provide the second seco	RIX CODE (a	SA DATE TIME DATE TIME	WT 6 1 18/1 5 1M	MI 6 / T C./20	WT G		-	-	WT G	Wr G	WT G	WT G		I AN J I I'M A I'M		DOINT NAME AND SIGNATION	
Section A Required Clent Information: Commany Colder Associates	GOIDEL ASSOCIATES	Address: 820 South Main Street, Suite 100	St Charles, MO 63301	Email To: maddock@dolder.com	636-724-9191 Fax: 636-724-9323	ted Due Date TAT' Standard		Section D Valid Matrix Codes	MALIKIA DRIMMATER WATER WASTE WATER PRODUCT SUL/SOLID	SAMPLE ID (A-Z, 0-9 /) Sample IDS MUST BE UNIQUE			2 S-D6-3	3	4	22	0 1		o	10	1	12	ADDITIONAL COMMENTS	P	age	12

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



#### **MEMORANDUM**

Project No. 1531406

DATE January 10, 2019

TO Project File Golder Associates

СС

**FROM** Tommy Goodwin

EMAIL tgoodwin@golder.com

## DATA VALIDATION SUMMARY: AMEREN – SIOUX ENERGY CENTER – VERIFICATION SAMPLING – DATA PACKAGE 60291371

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

- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Project	ny Name: <u>Golder Associates</u> Name: <u>Ameren - SCPC - VS- Jen Zov</u> er: <u>TGoodwin</u>	î	Proje	ect Numb	ger: <u>J Ingram</u> er: <u>1531406</u> e: <u>60291377 (D) /10/19</u>
Analytic Matrix:	tory: <u>Pace Analytical</u> cal Method (type and no.): Metals (200.78200.8), Hg (7470) $\Box$ Air $\Box$ Soil/Sed. $X$ Water $\Box$ Waste Names <u>S-DG-1</u> , S-DG-3	$\Box$ _	20B), TDS	( <del>SM 2540C</del> )	60291371 , FB (SM 3500-FB BH4), Anions (300.0), P (365.4), Ra (003.12.904.0) Anions (300.0)
NOTE:	Please provide calculation in Comment areas c	or on the	back (if (	on the ba	ck please indicate in comment areas).
Field In	nformation	YES	NO	NA	COMMENTS
a)	Sampling dates noted?	x			
b)	Sampling team indicated?	X			,
c)	Sample location noted?	x			
d)	Sample depth indicated (Soils)?			X	
e)	Sample type indicated (grab/composite)?	x			Grab
f)	Field QC noted?	x			
g)	Field parameters collected (note types)?	x			pH, Cond, Turb, Temp, DO, ORP, Q, DTW
h)	Field Calibration within control limits?	X			
i)	Notations of unacceptable field conditions/perform	nances fro	om field le	ogs or fiel	d notes?
			x		
j)	Does the laboratory narrative indicate deficiencies Note Deficiencies:			x	
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			
Genera	al (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) b) c) d) e) f) g)	Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used? Was the correct method used? Were appropriate reporting limits achieved? Were any sample dilutions noted? Were any matrix problems noted?				

#### QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks		YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?		Ø		·
b)	Were analytes detected in the field blank(s)?			Ź	
c)	Were analytes detected in the equipment blank(s)?			x	
d)	Were analytes detected in the trip blank(s)?			x	
Labora	tory 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?	Ø			
Duplica	ates	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	uplicate	sample n	ames)?	Dup-1@ MA
			Ø		FB-1@ //A
b)	Were field dup. precision criteria met (note RPD)?		Έ	$\square$	
c)	Were lab duplicates analyzed (note original and dup	olicate s	samples)?		
		X			
d)	Were lab dup. precision criteria met (note RPD)?	Þ			
Blind S	tandards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,			x	
	analytes included and concentrations)?				
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?		Ø		5042-
	Recovery could not be calculated since sample contained high concentration of analyte?			x	-
b)	Was MSD accuracy criteria met?	Ø			
	Recovery could not be calculated since sample contained high concentration of analyte?			x	
c)	Were MS/MSD precision criteria met?	$ ag{}$			
		/			

#### Comments/Notes:

Revised May 2004

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

#### Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				
	-			
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			$\backslash$	
	8			
			5	
7	111	/		1/1.1.
Signature:	g / Sordy	h		Date:/10/19

Revised May 2004



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

October 17, 2019

Jeffrey Ingram Golder Associates 13515 Barrett Parkway Drive Suite 260 Ballwin, MO 63021

#### RE: Project: AMEREN SIOUX ENERGY CTR Pace Project No.: 60312389

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between August 03, 2019 and August 20, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Jami Church

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

Enclosures

cc: Ryan Feldmann, Golder Mark Haddock, Golder Associates Eric Schneider, Golder Associates





#### CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

#### **Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 19-016-0 Arkansas Drinking Water Illinois Certification #: 004455 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212018-1 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-18-11 Utah Certification #: KS000212018-8 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



#### SAMPLE SUMMARY

#### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60312389001	S-UG-1A	Water	08/19/19 09:35	08/20/19 02:45
60312389002	S-UG-2	Water	08/19/19 09:20	08/20/19 02:45
60312389003	S-DG-1	Water	08/19/19 10:30	08/20/19 02:45
60312389004	S-DG-2	Water	08/19/19 11:15	08/20/19 02:45
60312389005	S-DG-3	Water	08/19/19 12:05	08/20/19 02:45
60312389006	S-DG-4	Water	08/19/19 11:20	08/20/19 02:45
60312389007	S-SCPC-DUP-1	Water	08/19/19 08:00	08/20/19 02:45
60312389008	S-SCPC-FB-1	Water	08/19/19 09:12	08/20/19 02:45
60310790002	S-BMW-1S	Water	08/01/19 10:55	08/03/19 02:50
60310790003	S-BMW-3S	Water	08/01/19 11:45	08/03/19 02:50



#### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60312389001	S-UG-1A	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60312389002	S-UG-2	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60312389003	S-DG-1	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60312389004	S-DG-2	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
0312389005	S-DG-3	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
0312389006	S-DG-4	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60312389007	S-SCPC-DUP-1	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60312389008	S-SCPC-FB-1	EPA 200.7	EMR	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790002	S-BMW-1S	EPA 200.7	НКС	7	PASI-K
		SM 2320B	MJK	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	JDS	3	PASI-K
60310790003	S-BMW-3S	EPA 200.7	НКС	7	PASI-K



Laboratory

PASI-K

PASI-K

PASI-K

Analytes Reported

BLA

JDS

1

1

3

#### SAMPLE ANALYTE COUNT

SM 2540C

EPA 300.0

Project: Pace Project	AMEREN SIOUX ENERGY CTR t No.: 60312389		
Lab ID	Sample ID	Method	Analysts
		SM 2320B	MJK



#### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Sample: S-UG-1A	Lab ID:	60312389001	Collected	d: 08/19/19	9 09:35	Received: 08/	20/19 02:45 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	270	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:43	7440-42-8	
Calcium	177000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:43	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:43	7439-89-6	
Magnesium	42000	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:43	7439-95-4	
Manganese	1080	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:43	7439-96-5	
Potassium	9530	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:43	7440-09-7	
Sodium	39100	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:43	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	320B						
Alkalinity, Total as CaCO3	437	mg/L	20.0	6.5	1		09/02/19 13:30		
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Solids	785	mg/L	10.0	10.0	1		08/26/19 13:50		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	145	mg/L	20.0	4.4	20		09/04/19 11:11	16887-00-6	
Fluoride	0.28	mg/L	0.20	0.085	1		09/03/19 23:38	16984-48-8	
Sulfate	57.7	mg/L	5.0	1.2	5		09/03/19 23:53	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 603

Sample: S-UG-2	Lab ID: 60312389002		Collected: 08/19/19 09:20			Received: 08/20/19 02:45 Matrix: Water				
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Boron	144	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:45	7440-42-8		
Calcium	116000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:45	7440-70-2		
Iron	<14.0	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:45	7439-89-6		
Magnesium	24600	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:45	7439-95-4		
Manganese	285	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:45	7439-96-5		
Potassium	4700	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:45	7440-09-7		
Sodium	30400	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:45	7440-23-5		
2320B Alkalinity	Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	362	mg/L	20.0	6.5	1		09/02/19 13:36			
2540C Total Dissolved Solids	Analytical Method: SM 2540C									
Total Dissolved Solids	519	mg/L	10.0	10.0	1		08/26/19 13:50			
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0									
Chloride	30.0	mg/L	5.0	1.1	5		09/04/19 00:23	16887-00-6		
Fluoride	0.25	mg/L	0.20	0.085	1		09/04/19 00:08	16984-48-8		
Sulfate	45.2	mg/L	5.0	1.2	5		09/04/19 00:23	14808-79-8		
		-								



#### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 6031

No.:	60312389

Sample: S-DG-1	Lab ID:	60312389003	Collected	: 08/19/19	9 10:30	Received: 08/	/20/19 02:45 M	atrix: Water		
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual	
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepar	ation Meth	od: EP	A 200.7				
Boron	106	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:52	7440-42-8		
Calcium	135000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:52	7440-70-2		
Iron	1230	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:52	7439-89-6		
Magnesium	32300	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:52	7439-95-4		
Manganese	275	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:52	7439-96-5		
Potassium	4010	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:52	7440-09-7		
Sodium	4230	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:52	7440-23-5		
2320B Alkalinity	Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	411	mg/L	20.0	6.5	1		09/02/19 13:42			
2540C Total Dissolved Solids	Analytical Method: SM 2540C									
Total Dissolved Solids	503	mg/L	10.0	10.0	1		08/26/19 13:50			
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0									
Chloride	6.2	mg/L	1.0	0.22	1		09/04/19 01:08	16887-00-6		
Fluoride	0.34	mg/L	0.20	0.085	1		09/04/19 01:08	16984-48-8		
Sulfate	41.7	mg/L	5.0	1.2	5		09/04/19 01:23	14808-79-8		
		-								



### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 6031

60312389	
00312303	

Lab ID:	60312389004	Collected	: 08/19/19	11:15	Received: 08/	20/19 02:45 Ma	atrix: Water	
Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: EPA 2	00.7 Prepar	ation Meth	od: EP	A 200.7			
104	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:54	7440-42-8	
133000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:54	7440-70-2	
691	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:54	7439-89-6	
33300	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:54	7439-95-4	
693	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:54	7439-96-5	
5140	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:54	7440-09-7	
4760	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:54	7440-23-5	
Analytical	Method: SM 23	20B						
425	mg/L	20.0	6.5	1		09/02/19 13:48		
Analytical	Method: SM 25	40C						
511	mg/L	10.0	10.0	1		08/26/19 15:06		
Analytical	Method: EPA 3	00.0						
8.2	mg/L	1.0	0.22	1		09/04/19 01:38	16887-00-6	
0.38	mg/L	0.20	0.085	1		09/04/19 01:38	16984-48-8	
37.1	mg/L	5.0	1.2	5		09/04/19 01:52	14808-79-8	
	Results Analytical 104 133000 691 33300 693 5140 4760 Analytical 425 Analytical 511 Analytical 8.2 0.38	Analytical Method: EPA 2 104 ug/L 133000 ug/L 691 ug/L 33300 ug/L 693 ug/L 5140 ug/L 4760 ug/L Analytical Method: SM 23 425 mg/L Analytical Method: SM 25 511 mg/L Analytical Method: EPA 3 8.2 mg/L 0.38 mg/L	Results         Units         PQL           Analytical Method: EPA 200.7         Prepare           104         ug/L         100           133000         ug/L         200           691         ug/L         50.0           33300         ug/L         50.0           693         ug/L         500           5140         ug/L         500           4760         ug/L         500           Analytical Method: SM 2320B         Analytical Method: SM 2540C           511         mg/L         10.0           Analytical Method: SM 2540C         511         ng/L           631         mg/L         10.0           Analytical Method: SM 2540C         511         ng/L           631         mg/L         10.0           Analytical Method: SM 2540C         511         0.0	Results         Units         PQL         MDL           Analytical Method: EPA 200.7         Preparation Method           104         ug/L         100         10.7           133000         ug/L         200         50.0           691         ug/L         50.0         14.0           33300         ug/L         500         13.0           693         ug/L         500         2.1           5140         ug/L         500         79.0           4760         ug/L         500         144           Analytical Method: SM 2320B         425         mg/L         20.0         6.5           Analytical Method: SM 2540C         511         mg/L         10.0         10.0           Analytical Method: EPA 300.0         8.2         mg/L         1.0         0.22           0.38         mg/L         0.20         0.085         0.0	Results         Units         PQL         MDL         DF           Analytical Method: EPA 200.7         Preparation Method: EPA         104         ug/L         100         10.7         1           133000         ug/L         200         50.0         1         1           691         ug/L         50.0         14.0         1           33300         ug/L         50.0         13.0         1           693         ug/L         50.0         13.0         1           693         ug/L         500         79.0         1           5140         ug/L         500         79.0         1           4760         ug/L         500         144         1           Analytical Method: SM 2320B         425         mg/L         20.0         6.5         1           Analytical Method: SM 2540C         511         mg/L         10.0         10.0         1           Analytical Method: EPA 300.0         1         4         1         1         1           Analytical Method: EPA 300.0         1.0         0.22         1         1         0.38         mg/L         0.20         0.085         1	Results         Units         PQL         MDL         DF         Prepared           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         104         ug/L         100         10.7         1         08/22/19 08:30           133000         ug/L         200         50.0         1         08/22/19 08:30           691         ug/L         50.0         14.0         1         08/22/19 08:30           33300         ug/L         50.0         14.0         1         08/22/19 08:30           693         ug/L         50.0         13.0         1         08/22/19 08:30           693         ug/L         50.0         13.0         1         08/22/19 08:30           693         ug/L         50.0         21.1         1         08/22/19 08:30           5140         ug/L         500         79.0         1         08/22/19 08:30           4760         ug/L         500         144         1         08/22/19 08:30           Analytical Method: SM 2320B         Inalytical Method: SM 2540C         Inalytical Method: SM 2540C         Inalytical Method: EPA 300.0         Inalytical Method: EPA 300.0         Inalytical Method: EPA 300.0         Inalytical Method: EPA 300.0         Inalytical Method: EPA 300.0	Results         Units         PQL         MDL         DF         Prepared         Analyzed           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         104         ug/L         100         10.7         1         08/22/19 08:30         08/22/19 18:54           133000         ug/L         200         50.0         1         08/22/19 08:30         08/22/19 18:54           691         ug/L         50.0         14.0         1         08/22/19 08:30         08/22/19 18:54           33300         ug/L         50.0         13.0         1         08/22/19 08:30         08/22/19 18:54           693         ug/L         5.0         2.1         1         08/22/19 08:30         08/22/19 18:54           5140         ug/L         500         79.0         1         08/22/19 08:30         08/22/19 18:54           Analytical Method: SM 2320B         425         mg/L         20.0         6.5         1         09/02/19 13:48           Analytical Method: SM 2540C         511         mg/L         10.0         10.0         1         08/26/19 15:06           Analytical Method: EPA 300.0         1         08/26/19 15:06         1         09/04/19 01:38           0.38         mg/L	Results         Units         PQL         MDL         DF         Prepared         Analyzed         CAS No.           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         1         08/22/19 08:30         08/22/19 18:54         7440-42-8           133000         ug/L         200         50.0         1         08/22/19 08:30         08/22/19 18:54         7440-42-8           133000         ug/L         200         50.0         1         08/22/19 08:30         08/22/19 18:54         7440-70-2           691         ug/L         50.0         14.0         1         08/22/19 08:30         08/22/19 18:54         7439-89-6           33300         ug/L         50.0         13.0         1         08/22/19 08:30         08/22/19 18:54         7439-89-6           33300         ug/L         50.0         2.1         1         08/22/19 08:30         08/22/19 18:54         7439-96-5           5140         ug/L         500         79.0         1         08/22/19 08:30         08/22/19 18:54         7440-09-7           4760         ug/L         500         79.0         1         08/22/19 08:30         08/22/19 18:54         7440-23-5           Analytical Method: SM 2320B         425         mg/L



### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Lab ID:	60312389005	Collected	1: 08/19/19	9 12:05	Received: 08/	20/19 02:45 Ma	atrix: Water	
Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP/	A 200.7			
95.1J	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:56	7440-42-8	
148000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:56	7440-70-2	
480	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:56	7439-89-6	
39100	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:56	7439-95-4	
722	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:56	7439-96-5	
6470	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:56	7440-09-7	
4680	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:56	7440-23-5	
Analytical	Method: SM 23	20B						
450	mg/L	20.0	6.5	1		09/02/19 13:54		
Analytical	Method: SM 25	40C						
624	mg/L	10.0	10.0	1		08/26/19 15:06		
Analytical	Method: EPA 3	00.0						
4.8	mg/L	1.0	0.22	1		09/04/19 02:07	16887-00-6	
0.37	•	0.20		1		09/04/19 02:07	16984-48-8	
49.5	•	5.0	1.2	5		09/04/19 02:22	14808-79-8	
	Results         Analytical         95.1J         148000         480         39100         722         6470         4680         Analytical         450         Analytical         624         Analytical         624         Analytical         624         Analytical         624         Analytical         624         Analytical         624         Analytical	Analytical Method: EPA 2 95.1J ug/L 148000 ug/L 480 ug/L 39100 ug/L 722 ug/L 6470 ug/L 4680 ug/L Analytical Method: SM 23 450 mg/L Analytical Method: SM 25 624 mg/L Analytical Method: EPA 3 4.8 mg/L 0.37 mg/L	Results         Units         PQL           Analytical Method: EPA 200.7         Prepare           95.1J         ug/L         100           148000         ug/L         200           480         ug/L         50.0           39100         ug/L         50.0           722         ug/L         500           6470         ug/L         500           4680         ug/L         500           Analytical Method: SM 2320B         4680         ug/L           450         mg/L         20.0           Analytical Method: SM 2540C         624         mg/L           624         mg/L         10.0           Analytical Method: EPA 300.0         4.8         mg/L         1.0           0.37         mg/L         0.20         4.8	Results         Units         PQL         MDL           Analytical Method: EPA 200.7         Preparation Method           95.1J         ug/L         100         10.7           148000         ug/L         200         50.0           480         ug/L         50.0         14.0           39100         ug/L         50.0         13.0           722         ug/L         5.0         2.1           6470         ug/L         500         79.0           4680         ug/L         500         144           Analytical Method: SM 2320B         4680         ug/L         60           450         mg/L         20.0         6.5           Analytical Method: SM 2540C         624         mg/L         10.0           Analytical Method: EPA 300.0         10.0         10.0           4.8         mg/L         1.0         0.22           0.37         mg/L         0.20         0.085	Results         Units         PQL         MDL         DF           Analytical Method: EPA 200.7         Preparation Method: EPA         95.1 J         ug/L         100         10.7         1           148000         ug/L         200         50.0         1           480         ug/L         50.0         14.0         1           39100         ug/L         50.0         13.0         1           722         ug/L         5.0         2.1         1           6470         ug/L         500         79.0         1           4680         ug/L         500         144         1           Analytical Method: SM 2320B         450         mg/L         20.0         6.5         1           Analytical Method: SM 2540C         624         mg/L         10.0         10.0         1           Analytical Method: EPA 300.0         1         1.0         0.22         1           4.8         mg/L         1.0         0.22         1           0.37         mg/L         0.20         0.085         1	Results         Units         PQL         MDL         DF         Prepared           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         95.1J         ug/L         100         10.7         1         08/22/19 08:30           148000         ug/L         200         50.0         1         08/22/19 08:30           480         ug/L         50.0         14.0         1         08/22/19 08:30           39100         ug/L         50.0         14.0         1         08/22/19 08:30           39100         ug/L         50.0         13.0         1         08/22/19 08:30           722         ug/L         5.0         2.1         1         08/22/19 08:30           6470         ug/L         500         79.0         1         08/22/19 08:30           6470         ug/L         500         79.0         1         08/22/19 08:30           6480         ug/L         500         144         1         08/22/19 08:30           Analytical Method: SM 2320B         E         450         mg/L         20.0         6.5         1           Analytical Method: SM 2540C         E         624         mg/L         10.0         10.0         1	Results         Units         PQL         MDL         DF         Prepared         Analyzed           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         Image: Second	Results         Units         PQL         MDL         DF         Prepared         Analyzed         CAS No.           Analytical Method:         EPA 200.7         Preparation Method:         EPA 200.7           95.1J         ug/L         100         10.7         1         08/22/19 08:30         08/22/19 18:56         7440-42-8           148000         ug/L         200         50.0         1         08/22/19 08:30         08/22/19 18:56         7440-70-2           480         ug/L         50.0         14.0         1         08/22/19 08:30         08/22/19 18:56         7440-70-2           480         ug/L         50.0         14.0         1         08/22/19 08:30         08/22/19 18:56         7439-89-6           39100         ug/L         50.0         13.0         1         08/22/19 08:30         08/22/19 18:56         7439-95-4           722         ug/L         5.0         2.1         1         08/22/19 08:30         08/22/19 18:56         7440-09-7           4680         ug/L         500         79.0         1         08/22/19 08:30         08/22/19 18:56         7440-09-7           4680         ug/L         500         144         1         08/22/19 08:30         08/22/19 18:56



09/04/19 02:37 16984-48-8

09/04/19 03:22 14808-79-8

### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Fluoride

Sulfate

Sample: S-DG-4	Lab ID:	60312389006	Collecte	d: 08/19/19	9 11:20	Received: 08/	20/19 02:45 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 20	00.7 Prepa	aration Meth	nod: EP	A 200.7			
Boron	61.1J	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 18:59	7440-42-8	
Calcium	136000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 18:59	7440-70-2	
Iron	115	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 18:59	7439-89-6	
Magnesium	39500	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 18:59	7439-95-4	
Manganese	499	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 18:59	7439-96-5	
Potassium	7570	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 18:59	7440-09-7	
Sodium	44600	ug/L	500	144	1	08/22/19 08:30	08/22/19 18:59	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	403	mg/L	20.0	6.5	1		09/02/19 14:09		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	671	mg/L	10.0	10.0	1		08/26/19 15:06		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	103	mg/L	10.0	2.2	10		09/04/19 14:21	16887-00-6	

0.20

5.0

0.085

1.2

1

5

0.32

31.5

mg/L

mg/L



### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Sample: S-SCPC-DUP-1	Lab ID:	60312389007	Collected	d: 08/19/19	08:00	Received: 08/	20/19 02:45 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP/	A 200.7			
Boron	96.4J	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 19:05	7440-42-8	
Calcium	149000	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 19:05	7440-70-2	
Iron	544	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 19:05	7439-89-6	
Magnesium	39100	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 19:05	7439-95-4	
Manganese	734	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 19:05	7439-96-5	
Potassium	6560	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 19:05	7440-09-7	
Sodium	4740	ug/L	500	144	1	08/22/19 08:30	08/22/19 19:05	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	438	mg/L	20.0	6.5	1		09/02/19 14:21		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	597	mg/L	10.0	10.0	1		08/26/19 15:06		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	4.8	mg/L	1.0	0.22	1		09/04/19 04:37	16887-00-6	
Fluoride	0.37	mg/L	0.20	0.085	1		09/04/19 04:37	16984-48-8	
Sulfate	50.1	mg/L	5.0	1.2	5		09/04/19 04:52	14808-79-8	



### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Sample: S-SCPC-FB-1	Lab ID:	60312389008	Collected	d: 08/19/19	9 09:12	Received: 08/	20/19 02:45 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	<10.7	ug/L	100	10.7	1	08/22/19 08:30	08/22/19 19:07	7440-42-8	
Calcium	51.9J	ug/L	200	50.0	1	08/22/19 08:30	08/22/19 19:07	7440-70-2	В
Iron	<14.0	ug/L	50.0	14.0	1	08/22/19 08:30	08/22/19 19:07	7439-89-6	
Magnesium	14.1J	ug/L	50.0	13.0	1	08/22/19 08:30	08/22/19 19:07	7439-95-4	
Manganese	<2.1	ug/L	5.0	2.1	1	08/22/19 08:30	08/22/19 19:07	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	08/22/19 08:30	08/22/19 19:07	7440-09-7	
Sodium	<144	ug/L	500	144	1	08/22/19 08:30	08/22/19 19:07	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	<6.5	mg/L	20.0	6.5	1		09/02/19 14:25		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	16.0	mg/L	5.0	5.0	1		08/26/19 15:06		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	<0.22	mg/L	1.0	0.22	1		09/04/19 05:07	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		09/04/19 05:07	16984-48-8	
Sulfate	<0.23	mg/L	1.0	0.23	1		09/04/19 05:07	14808-79-8	



Qual

В

### **ANALYTICAL RESULTS**

### Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Sample: S-BMW-1S	Lab ID:	60310790002	Collecte	d: 08/01/19	9 10:55	Received: 08/	03/19 02:50 M	atrix: Water
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	aration Meth	nod: EP	A 200.7		
Boron	70.8J	ug/L	100	10.7	1	08/07/19 14:31	08/09/19 12:51	7440-42-8
Calcium	149000	ug/L	200	50.0	1	08/07/19 14:31	08/08/19 16:36	7440-70-2
Iron	<14.0	ug/L	50.0	14.0	1	08/07/19 14:31	08/08/19 16:36	7439-89-6
Magnesium	28400	ug/L	50.0	13.0	1	08/07/19 14:31	08/08/19 16:36	7439-95-4
Manganese	472	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:36	7439-96-5
Potassium	383 1	ua/l	500	70.0	1	08/07/10 1/-31	08/08/10 16.36	7440-00-7

Manganese	4/2	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:36	7439-96-5	
Potassium	383J	ug/L	500	79.0	1	08/07/19 14:31	08/08/19 16:36	7440-09-7	
Sodium	5350	ug/L	500	144	1	08/07/19 14:31	08/08/19 16:36	7440-23-5	
2320B Alkalinity	Analytical	Method: SM	2320B						
Alkalinity, Total as CaCO3	432	mg/L	20.0	6.5	1		08/15/19 11:20		
2540C Total Dissolved Solids	Analytical	Method: SM	2540C						
Total Dissolved Solids	548	mg/L	10.0	10.0	1		08/07/19 13:13		
300.0 IC Anions 28 Days	Analytical	Method: EP	A 300.0						
Chloride	8.8	mg/L	1.0	0.22	1		08/15/19 04:53	16887-00-6	
Fluoride	0.31	mg/L	0.20	0.085	1		08/15/19 04:53	16984-48-8	
Sulfate	34.1	mg/L	2.0	0.46	2		08/15/19 05:44	14808-79-8	



08/15/19 06:01 16984-48-8

08/15/19 06:17 14808-79-8

### ANALYTICAL RESULTS

### Project: AMEREN SIOUX ENERGY CTR

0.35

25.3

mg/L

mg/L

Pace Project No.: 60312389

Fluoride

Sulfate

Sample: S-BMW-3S	Lab ID:	60310790003	Collecte	d: 08/01/19	9 11:45	Received: 08/	/03/19 02:50 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	aration Meth	od: EP	A 200.7			
Boron	73.9J	ug/L	100	10.7	1	08/07/19 14:31	08/09/19 12:53	7440-42-8	В
Calcium	122000	ug/L	200	50.0	1	08/07/19 14:31	08/08/19 16:38	7440-70-2	
Iron	44.3J	ug/L	50.0	14.0	1	08/07/19 14:31	08/08/19 16:38	7439-89-6	
Magnesium	22400	ug/L	50.0	13.0	1	08/07/19 14:31	08/08/19 16:38	7439-95-4	
Manganese	298	ug/L	5.0	2.1	1	08/07/19 14:31	08/08/19 16:38	7439-96-5	
Potassium	648	ug/L	500	79.0	1	08/07/19 14:31	08/08/19 16:38	7440-09-7	
Sodium	5280	ug/L	500	144	1	08/07/19 14:31	08/08/19 16:38	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	358	mg/L	20.0	6.5	1		08/15/19 11:25		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	452	mg/L	10.0	10.0	1		08/07/19 13:14		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	10.6	mg/L	1.0	0.22	1		08/15/19 06:01	16887-00-6	

0.20

2.0

0.085

0.46

1

2



Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

)1714	Analysis Mo	ethod:	EPA 200.7			
PA 200.7	Analysis De	escription:	200.7 Metals, Total			
s: 60310790002, 60310790003						
i1467	Matrix	k: Water				
60310790002, 60310790003						
r Units	Blank	1 0				
F S S	51467 s: 60310790002, 60310790003	PA 200.7 Analysis De s: 60310790002, 60310790003 61467 Matrix s: 60310790002, 60310790003 Blank	PA 200.7 Analysis Description: s: 60310790002, 60310790003 61467 Matrix: Water s: 60310790002, 60310790003 Blank Reporting	PA 200.7 Analysis Description: 200.7 Metals, Total s: 60310790002, 60310790003 S1467 Matrix: Water s: 60310790002, 60310790003 Blank Reporting	PA 200.7 Analysis Description: 200.7 Metals, Total s: 60310790002, 60310790003 61467 Matrix: Water s: 60310790002, 60310790003 Blank Reporting	PA 200.7 Analysis Description: 200.7 Metals, Total s: 60310790002, 60310790003 61467 Matrix: Water s: 60310790002, 60310790003 Blank Reporting

Units	Result	Limit	MDL	Analyzed	Qualifiers
ug/L	11.8J	100	10.7	08/09/19 12:44	
ug/L	<50.0	200	50.0	08/08/19 16:31	
ug/L	<14.0	50.0	14.0	08/08/19 16:31	
ug/L	<13.0	50.0	13.0	08/08/19 16:31	
ug/L	<2.1	5.0	2.1	08/08/19 16:31	
ug/L	<79.0	500	79.0	08/08/19 16:31	
ug/L	<144	500	144	08/08/19 16:31	
	ug/L ug/L ug/L ug/L ug/L ug/L	ug/L         11.8J           ug/L         <50.0	ug/L         11.8J         100           ug/L         <50.0	ug/L         11.8J         100         10.7           ug/L         <50.0	ug/L         11.8J         100         10.7         08/09/19 12:44           ug/L         <50.0

### LABORATORY CONTROL SAMPLE: 2461468

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	987	99	85-115	
Calcium	ug/L	10000	9780	98	85-115	
Iron	ug/L	10000	9860	99	85-115	
Magnesium	ug/L	10000	9530	95	85-115	
Manganese	ug/L	1000	988	99	85-115	
Potassium	ug/L	10000	9940	99	85-115	
Sodium	ug/L	10000	10300	103	85-115	

MATRIX SPIKE & MATRIX	SPIKE DUPL	ICATE: 2461	469 MS	MSD	2461470							
		60310791001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	217	1000	1000	1230	1210	101	100	70-130	1	20	
Calcium	ug/L	58100	10000	10000	70000	68700	119	106	70-130	2	20	
Iron	ug/L	1010	10000	10000	10700	10800	97	97	70-130	1	20	
Magnesium	ug/L	16700	10000	10000	26800	26400	101	97	70-130	1	20	
Manganese	ug/L	113	1000	1000	1100	1100	98	99	70-130	0	20	
Potassium	ug/L	4210	10000	10000	14400	14300	102	101	70-130	0	20	
Sodium	ug/L	14000	10000	10000	24700	24300	107	103	70-130	2	20	

MATRIX SPIKE & MATRIX SP		CATE: 2461	471		2461472							
	MS Spike	MSD Spike	MS	MSD	MS	MSD	% Rec		Max			
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron	ug/L	12400	1000	1000	13200	13600	84	116	70-130	2	20	
Calcium	ug/L	171000	10000	10000	180000	184000	94	127	70-130	2	20	

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Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

MATRIX SPIKE & MATRIX	SPIKE DUPLIC	UPLICATE: 2461471				2461472								
Parameter	6 Units	0310791002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual		
Iron	ug/L	416	10000	10000	10100	10200	97	98	70-130	0	20			
Magnesium	ug/L	5320	10000	10000	14500	14700	92	94	70-130	1	20			
Manganese	ug/L	168	1000	1000	1140	1160	97	99	70-130	1	20			
Potassium	ug/L	22900	10000	10000	33000	33600	101	107	70-130	2	20			
Sodium	ug/L	46500	10000	10000	56500	57800	100	113	70-130	2	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.



Project:	AMER	EN SIOUX E	NERGY CTR										
Pace Project No.:	60312	389											
QC Batch:	6048	15		Anal	sis Metho	od: I	EPA 200.7						
QC Batch Method:	EPA	200.7		Anal	ysis Desci	ription: 2	200.7 Metal	s, Total					
Associated Lab San	nples:	603123890 603123890	01, 6031238900 08	2, 6031238	39003, 603	312389004,	603123890	05, 60312	2389006, 60	312389007	7,		
METHOD BLANK:	24724	48			Matrix: V	Vater							
Associated Lab San	nples:	603123890 603123890	,	2, 60312389003, 60		312389004,	603123890	05, 60312	2389006, 60	312389007	7,		
Paran	neter		Units	Blaı Res		Reporting Limit	MDI	L	Analyzed	l Qı	ualifiers		
Boron			ug/L		<10.7	10		10.7					
Calcium			ug/L		<10.7 50.1J	20		-	08/22/19 18 08/22/19 18				
Iron			ug/L		<14.0	50.			08/22/19 18 08/22/19 18				
Magnesium			ug/L		<13.0	50.			08/22/19 18				
Manganese			ug/L		<2.1	5.	0	2.1	08/22/19 18	:41			
Potassium			ug/L		<79.0	50	0	79.0	08/22/19 18	:41			
Sodium			ug/L		<144	50	0	144	08/22/19 18	:41			
LABORATORY CON	NTROL	SAMPLE:	2472449										
Paran	neter		Units	Spike Conc.		CS esult	LCS % Rec		Rec nits	Qualifiers			
Boron			ug/L	100	00	980	98	 B	85-115		_		
Calcium			ug/L	1000	00	10400	104	4	85-115				
Iron			ug/L	1000	00	10200	102	2	85-115				
Magnesium			ug/L	1000		10200	102	2	85-115				
Manganese			ug/L	100		1030	103		85-115				
Potassium			ug/L	1000		9760	98		85-115				
Sodium			ug/L	1000	00	9830	98	8	85-115				
MATRIX SPIKE & M	IATRIX	SPIKE DUPL	_ICATE: 2472	450		2472451							
				MS	MSD	-							
			60312389006	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter		Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Boron		ug/L		1000	1000	1060	1070	10	0 101	70-130	2	20	
Calcium		ug/L	136000	10000	10000	146000	148000	9	8 121	70-130	2	20	
Iron		ug/L	115	10000	10000	9830	10000	9	7 99	70-130	2	20	
Magnesium		ug/L	39500	10000	10000	49400	49900	10	0 104	70-130	1	20	
Manganese		ug/L	499	1000	1000		1520	9			2	20	
Potassium		ug/L	7570	10000	10000		17400	9			2		
Sodium		ug/L	44600	10000	10000	54600	55100	10	0 106	5 70-130	1	20	

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· <b>,</b> · · · ·	UX ENERGY CTR							
Pace Project No.: 60312389		An aluait MA	- 411-	CM 0000D				
QC Batch: 603364		Analysis Mo		SM 2320B				
QC Batch Method: SM 2320B		Analysis De	escription:	2320B Alkalin	iity			
Associated Lab Samples: 60310	790002, 60310790003							
METHOD BLANK: 2467297		Matrix	: Water					
Associated Lab Samples: 60310	790002, 60310790003							
		Blank	Reporting					
Parameter	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20	.0	6.5	08/15/19	10:55	
LABORATORY CONTROL SAMPL	E: 2467298							
		Spike	LCS	LCS		Rec		
Parameter	Units	Conc.	Result	% Rec	L	imits	Qua	alifiers
Alkalinity, Total as CaCO3	mg/L	500	486	97		90-110		
SAMPLE DUPLICATE: 2467299								
		60310412023	Dup			Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	277	29		7		10	
SAMPLE DUPLICATE: 2467300								
		60310791002	Dup			Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	186	5 18		0		10	

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Project:			ENERGY CTR								
Pace Project No.:	60312	389									
QC Batch:	6066	29		Analysis M	ethod:	SM 2320B					
QC Batch Method:	SM 2	320B		Analysis D	escription:	2320B Alka	inity				
Associated Lab Sar	mples:	60312389 60312389	,	02, 60312389003,	6031238900	4, 603123890	05, 603	12389006,	603123	389007,	
METHOD BLANK:	24792	08		Matri	x: Water						
Associated Lab Sar	mples:	60312389 60312389	,	02, 60312389003,	6031238900	4, 603123890	05, 603	12389006,	603123	889007,	
				Blank	Reporting	-					
Parar	neter		Units	Result	Limit	MD	L	Analyz	zed	Qualifiers	
Alkalinity, Total as C	CaCO3		mg/L	<6.	5 2	20.0	6.5	09/02/19	11:48		
LABORATORY CO		SAMPI F	2479209								
		O/ WIII EE.	2410200	Spike	LCS	LCS	9	6 Rec			
Parar	neter		Units	Conc.	Result	% Rec	L	imits	Qual	ifiers	
Alkalinity, Total as C	CaCO3		mg/L	500	487	9	7	90-110			
SAMPLE DUPLICA	TE: 24	79210									
				60312275001	Dup			Max			
Parar	neter		Units	Result	Result	RPI	)	RPD		Qualifiers	
Alkalinity, Total as C	CaCO3		mg/L	96.9	5	154	46		10 D6	5	
SAMPLE DUPLICA	TE: 24	79211									
				60312389006				Max			
Parar	neter		Units	Result	Result	RPI	)	RPD		Qualifiers	
Alkalinity, Total as C	CaCO3		mg/L	403	3	404	0		10		

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Project: AMEREN SIOUX	ENERGY CTR						
Pace Project No.: 60312389		Analusi- BA	- 411-	CM 05400			
QC Batch: 601524		Analysis Me		SM 2540C			
QC Batch Method: SM 2540C		Analysis De	escription:	2540C Total L	Dissolved Solid	S	
Associated Lab Samples: 60310790	0002, 60310790003	3					
METHOD BLANK: 2460999		Matrix	: Water				
Associated Lab Samples: 60310790	0002, 6031079000	3					
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Anal	yzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5	.0	5.0 08/07/1	9 13:10	
LABORATORY CONTROL SAMPLE:	2461000						
	2101000	Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers
Total Dissolved Solids	mg/L	1000	982	98	80-12	0	
SAMPLE DUPLICATE: 2461001							
		60310791002	Dup		Ма	(	
Parameter	Units	Result	Result	RPD	RPI	)	Qualifiers
Total Dissolved Solids	mg/L	822	80		2	10	
	Ũ						
SAMPLE DUPLICATE: 2461002							
		60310412023	Dup		Max	(	
Parameter	Units	Result	Result	RPD	RPI	)	Qualifiers

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Project: AMEF	REN SIOUX ENERGY CTR						
Pace Project No.: 60312	2389						
QC Batch: 6054	419	Analysis M	ethod:	SM 2540C			
QC Batch Method: SM 2	2540C	Analysis De	escription:	2540C Total E	Dissolved Solids	;	
Associated Lab Samples:	60312389001, 60312389	002, 60312389003					
METHOD BLANK: 24751	117	Matrix	k: Water				
Associated Lab Samples:	60312389001, 60312389	002, 60312389003					
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Analy	zed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	) 5	.0	5.0 08/26/19	9 13:47	
LABORATORY CONTROL	SAMPLE: 2475118						
		Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers
Total Dissolved Solids	mg/L	1000	997	100	80-120		
SAMPLE DUPLICATE: 2	475119						
		60312240001	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	mg/L	861	85	57	0	10	
SAMPLE DUPLICATE: 2	475120						
		60312291003	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	mg/L	433	3 41	5	4	10	

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Project: AME	REN SIOUX ENER 2389	GY CTR							
QC Batch: 605	420		Analysis M	ethod:	SM 25400	2			
QC Batch Method: SM	2540C		Analysis De	escription:	2540C To	tal Disso	olved Solids		
Associated Lab Samples:	60312389004, 6	0312389005	5, 60312389006,	60312389007	7, 6031238	9008			
METHOD BLANK: 2475	121		Matrix	: Water					
Associated Lab Samples:	60312389004, 6	0312389005	5, 60312389006,	60312389007	, 6031238	8008			
			Blank	Reporting					
Parameter		Units	Result	Limit	N	DL	Analyz	zed	Qualifiers
Total Dissolved Solids		mg/L	<5.0	) !	5.0	5.0	08/26/19	15:05	
ABORATORY CONTROL	SAMPLE: 2475	122							
			Spike	LCS	LCS		% Rec		
Parameter		Units	Conc.	Result	% Rec		Limits	Qua	alifiers
Total Dissolved Solids		mg/L	1000	1020		02	80-120		
SAMPLE DUPLICATE: 2	2475123								
			60312389006	Dup			Max		
Parameter		Units	Result	Result	R	PD	RPD		Qualifiers
Total Dissolved Solids		mg/L	671	7	05	5		10	
SAMPLE DUPLICATE: 2	2475124								
			60312546001	Dup			Max		
Parameter		Units	Result	Result	R	PD	RPD		Qualifiers
Fotal Dissolved Solids		mg/L	3010	) 27	/80	8		10	

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Project:	AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

QC Batch: 603127		Analysis M	lethod:	EPA 300	0.0			
QC Batch Method: EPA 300.0		Analysis D	escription:	300.0 IC	Anions			
Associated Lab Samples: 6031079	0002, 60310790003							
METHOD BLANK: 2466421		Matr	ix: Water					
Associated Lab Samples: 6031079	0002, 60310790003							
		Blank	Reportin	g				
Parameter	Units	Result	Limit		MDL	Analyz	zed	Qualifiers
Chloride	mg/L	<0.2	2	1.0	0.22	08/14/19	11:57	
Fluoride	mg/L	<0.08	5 (	).20	0.085	08/14/19	11:57	
Sulfate	mg/L	<0.2	3	1.0	0.23	08/14/19	11:57	
LABORATORY CONTROL SAMPLE:	2466422							
		Spike	LCS	LCS	c	% Rec		
Parameter	Units	Conc.	Result	% Red	;	Limits	Qualifie	ers
Chloride	mg/L	5	4.7		94	90-110		
Fluoride	mg/L	2.5	2.4		97	90-110		
Sulfate	mg/L	5	4.7		95	90-110		

MATRIX SPIKE & MATRIX SP	IKE DUPLIC	CATE: 2466		2466424								
			MS	MSD								
	6	0310412023	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	25.5	25	25	50.0	49.4	98	96	80-120	1	15	
Fluoride	mg/L	2.1	2.5	2.5	4.6	4.7	101	102	80-120	1	15	
Sulfate	mg/L	96.6	25	25	122	120	100	94	80-120	1	15	E

MATRIX SPIKE SAMPLE:	2466425						
		60310952001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	46500	50000	99400	106	80-120	
Fluoride	mg/L	ND	25000	24700	99	80-120	
Sulfate	mg/L	21700	50000	73700	104	80-120	

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Project: Pace Project No.:	AMER 60312:		ENERGY CTR								
QC Batch:	6070			Analysis M	lethor	ŀ F	EPA 300.0				
QC Batch Method:		300.0		Analysis D			00.0 IC Anions				
			9001, 60312389002,	,				0242280006 6	00400	00007	
Associated Lab Sar	npies:	60312389		60312369003	, 603	2369004, 6	00312389005, 6	0312369006, 6	03123	69007,	
METHOD BLANK:	24808	52		Matri	x: Wa	ater					
Associated Lab Sa	mples:	60312389 60312389	9001, 60312389002, 9008	60312389003	, 6031	2389004, 6	60312389005, 6	0312389006, 6	03123	89007,	
				Blank	F	Reporting					
Para	neter		Units	Result		Limit	MDL	Analyze	ed	Qualifie	rs
Chloride			mg/L	<0.2	2	1.0	0 0.2	2 09/03/19 1	9:09		
Fluoride			mg/L	<0.08	5	0.20	0.08	5 09/03/19 1	9:09		
Sulfate			mg/L	<0.2	3	1.0			9:09		
LABORATORY CO	NTROL	SAMPLE:	2480853	0		-					
Para	neter		Units	Spike Conc.	LC Res		LCS % Rec	% Rec Limits	Quali	fiors	
	netei				1103				Quan		
Chloride			mg/L	5		4.6 2.4	93	90-110			
Fluoride Sulfate			mg/L	2.5 5		2.4 5.0	97 100	90-110 90-110			
Sullate			mg/L	5		5.0	100	90-110			
MATRIX SPIKE SA	MPLE:		2480854								
				603123880	04	Spike	MS	MS	ç	% Rec	
Parar	neter		Units	Result		Conc.	Result	% Rec	I	Limits	Qualifiers
Chloride			mg/L			50	134	109	9	80-120	H5
Fluoride			mg/L			25	25.1	96	6	80-120	H5
Sulfate			mg/L			50	193	110	)	80-120	H5
MATRIX SPIKE SA	MPLE:		2480855								
				603123890	06	Spike	MS	MS	ç	% Rec	
Para	neter		Units	Result		Conc.	Result	% Rec		Limits	Qualifiers
Fluoride			mg/L	<	0.85	2.5	2.8	101	1	80-120	
			mg/L		31.5	25	58.6	109		80-120	

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,	MEREN SIOUX 312389	ENERGY CTR										
	607229		Anal	ysis Metho	d:	EPA 300.0						
QC Batch Method:	EPA 300.0		Anal	ysis Descri	iption:	300.0 IC Ani	ons					
Associated Lab Sample	es: 60312389	001, 6031238900	6									
METHOD BLANK: 24	81446			Matrix: W	/ater							
Associated Lab Sample	es: 60312389	001, 6031238900	6									
Paramete	er	Units	Bla Res		Reporting Limit	MDL	-	Analyzed	Qu	ualifiers	;	
Chloride		mg/L		<0.22	1.	0	0.22 0	9/04/19 09:	29			
LABORATORY CONTR	ROL SAMPLE:	2481447										
Paramete	er	Units	Spike Conc.	LC Re:	CS sult	LCS % Rec	% F Lim		Qualifiers			
Chloride		mg/L		5	4.7	95	5	90-110				
MATRIX SPIKE & MAT	RIX SPIKE DUF	PLICATE: 2481	448		2481449	)						
			MS	MSD					_			
Parameter	Units	60312389006 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	. 103	50	50	160	154	114	101	80-120	4	15	
MATRIX SPIKE SAMPI	_E:	2481452										
Paramete	~r	Unito		2725002	Spike	MS Booult	n	MS ( Boo	% Rec		Oucli	fioro
	÷I	Units	R	esult	Conc.	Result		6 Rec	Limits		Qualit	liers
Chloride		mg/L		3140	2500	5	760	105	80	-120		

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



### QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

### 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.

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

TNI - The NELAC Institute.

### LABORATORIES

PASI-K Pace Analytical Services - Kansas City

### ANALYTE QUALIFIERS

- B Analyte was detected in the associated method blank.
- D6 The precision between the sample and sample duplicate exceeded laboratory control limits.
- E Analyte concentration exceeded the calibration range. The reported result is estimated.
- H5 Reanalysis conducted in excess of EPA method holding time. Results confirm original analysis performed in hold time.



### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR

Pace Project No.: 60312389

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60310790002	S-BMW-1S	EPA 200.7	601714	EPA 200.7	601738
60310790003	S-BMW-3S	EPA 200.7	601714	EPA 200.7	601738
0312389001	S-UG-1A	EPA 200.7	604815	EPA 200.7	604890
0312389002	S-UG-2	EPA 200.7	604815	EPA 200.7	604890
0312389003	S-DG-1	EPA 200.7	604815	EPA 200.7	604890
0312389004	S-DG-2	EPA 200.7	604815	EPA 200.7	604890
0312389005	S-DG-3	EPA 200.7	604815	EPA 200.7	604890
0312389006	S-DG-4	EPA 200.7	604815	EPA 200.7	604890
0312389007	S-SCPC-DUP-1	EPA 200.7	604815	EPA 200.7	604890
0312389008	S-SCPC-FB-1	EPA 200.7	604815	EPA 200.7	604890
0310790002	S-BMW-1S	SM 2320B	603364		
0310790003	S-BMW-3S	SM 2320B	603364		
0312389001	S-UG-1A	SM 2320B	606629		
60312389001 60312389002	S-UG-1A S-UG-2	SM 2320B SM 2320B	606629		
60312389002 60312389003	S-DG-1	SM 2320B SM 2320B	606629		
0312389003	S-DG-2	SM 2320B	606629		
0312389005	S-DG-3	SM 2320B	606629		
0312389006	S-DG-4	SM 2320B	606629		
0312389007 0312389008	S-SCPC-DUP-1 S-SCPC-FB-1	SM 2320B SM 2320B	606629 606629		
0310790002	S-BMW-1S	SM 2540C	601524		
0310790003	S-BMW-3S	SM 2540C	601524		
0312389001	S-UG-1A	SM 2540C	605419		
0312389002	S-UG-2	SM 2540C	605419		
0312389003	S-DG-1	SM 2540C	605419		
0312389004	S-DG-2	SM 2540C	605420		
0312389005	S-DG-3	SM 2540C	605420		
0312389006	S-DG-4	SM 2540C	605420		
0312389007	S-SCPC-DUP-1	SM 2540C	605420		
0312389008	S-SCPC-FB-1	SM 2540C	605420		
0310790002	S-BMW-1S	EPA 300.0	603127		
0310790003	S-BMW-3S	EPA 300.0	603127		
0312389001	S-UG-1A	EPA 300.0	607014		
0312389001	S-UG-1A	EPA 300.0	607229		
0312389002	S-UG-2	EPA 300.0	607014		
0312389003	S-DG-1	EPA 300.0	607014		
0312389004	S-DG-2	EPA 300.0	607014		
0312389005	S-DG-3	EPA 300.0	607014		
0312389006	S-DG-4	EPA 300.0	607014		
0312389006	S-DG-4	EPA 300.0	607229		
0312389007	S-SCPC-DUP-1	EPA 300.0	607014		
201200001	S-SCPC-FB-1	EPA 300.0	607014		



Sample Condition Upon Receipt

### WO#:60312389 60312389

Client Name: Golder Associo	ites	
Courier: FedEx UPS VIA Clay P	EX 🗆 ECI 🗆	Pace 🗆 Xroads 🖌 Client 🗅 Other 🗆
Tracking #: Pace	e Shipping Label Us	,
Custody Seal on Cooler/Box Present: Yes 💋 No 🗆	Seals intact: Yes	
Packing Material: Bubble Wrap  Bubble Bags		12-14
Thermometer Used: 1295 Type of	Ice: Wet Blue N	lone
Cooler Temperature (°C): As-read . 4,0.4,0.5	FO. 2 Corre	ected 1.2,0.2,4, Date and initials of person examining contents: 103 8/20/19
Temperature should be above freezing to 6°C		
Chain of Custody present:		A
Chain of Custody relinquished:	Yes DNO DN/	A
Samples arrived within holding time:	Ves No N/	4
Short Hold Time analyses (<72hr):		A
Rush Turn Around Time requested:	□Yes 🗖 No □N//	A
Sufficient volume:	ZYes □No □N//	A
Correct containers used:	ØYes □No □N//	4
Pace containers used:	Yes No N/	A
Containers intact:	/	A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?		Δ
Filtered volume received for dissolved tests?	/	
Sample labels match COC: Date / time / ID / analyses	Yes No N/	A
Samples contain multiple phases? Matrix: W+	Yes No N/	
Containers requiring pH preservation in compliance? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	ZYes No N/	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:	□Yes □No	
Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
	1	
Trip Blank present:		
Headspace in VOA vials ( >6mm):	Yes No AN/	A
Samples from USDA Regulated Area:State:		A
Additional labels attached to 5035A / TX1005 vials in the field?		X .
Client Notification/ Resolution: Copy COC to		Field Data Required? Y / N
Person Contacted: Date/Tim	me:	
Comments/ Resolution:		
		8/21/19
Project Manager Review: Janui Church	Da	ate:

Project Manager Review:

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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.

			DRINKING WATER	8					555 CIT	Pace Project No/ Lab I.D.	100	600	202	007	067	cole						DITIONS		4	1		toe/n	(N/Y) I selq	ms2	
of		10	DRIN	OTHER					4	e Projec					1.41	z						SAMPLE CONDITIONS		$\geq$	1		10100	boteu: pO be	IB92	
			TER								32				-	000	Z	~				SAP		>	~			рөүіэ: 1\Y) ө.		
Page:			GROUND WATER	4			A	1111	(N/Y) enino	Residual Chl	080	-					60	7	+	+	-		-	2.1	2:0	4.1	<u>э</u> .	ui dw	төт	
		AGENC	GROI	RCRA		DW I	(N/N) p				8030	-	_	=	×	350%	NC22	÷	_	1	-	TIME	15:51	520					4	
		REGULATORY AGENCY	NPDES	UST	Site Location	STATE:	Requested Analysis Filtered (Y/N)				Bozu		_	_		38020		>				DATE	6tots						1/41/	
	Γ	REC	_		Sit		lested Ana	z z z	yoınə	TDS Alkalinity Total Phosp		511				2	A	7	1		1	TION		Ι,					DATE Signed &	
							Requ	z z	oride/Sulfate	Metals* Chloride/Flu	111	1 1			-		-	9 7	4		-	/ AFFILIA		Snon-IDau					DATE (MM/D	
					thurch			atives Y N	ţîs9T	NaOH Na2S <sub>2</sub> O <sub>3</sub> Methanol Other Other										1		ACCEPTED BY / AFFILIATION	20 MOUL	24			1 1 M	ren	Ĵ	
Section C Invoice Information:		Name;		0	d Jamie Church	e# 9285		Preservatives		HCI HNO <sup>3</sup> H⁵2O⁵	( )			_				۹.					CAUNA	SI Narta	-		. 6	111	CIV	
Section C	Attention:	Company Name:	Address:	Pace Quote	Pace Project Manager	Pace Profile #		_		# OF CONTAI	15			_			-	7	1		mr.	TIME	1242	13:51			ш	P	0	
									AT COLLECTION	M M M M M M M M A M A M A M A R M A R M A R M A R M A R M M A R M M M M										4	1	DATE	8/1+1/u	5110/10			D SIGNATUR	PRINT Name of SAMPLER:	SIGNATURE of SAMPLER:	
		eider			Center	COC#7)		COLLECTED	COMPOSITE END/SRAB	DATE	3		/	/	/	1						NOL	N.S				SAMPLER NAME AND SIGNATURE	PRINT Name	SIGNATURE	
		n/Eric Schneider			oux Energy Center	01.0003C (COC#7)		COLL	START	TIME	7 0335	5120	2501	1115	ins	:120	(	2 5	[	1	1123	BY / AFFILIATION	1600	4			SAMPL			
ormation:	Ingram	Ryan Feldmann/			Ameren Sio	53-1406-		( 1141		SAMPLE TYPE	G SIMICA	0	U	U	U	U	U	U	U	1	<b>U</b>	RELINQUISHED BY	70. ×							
Section B Required Project Information:	Report To: Jeffrey Ingram			Purchase Order No.:	Project Name: Ai	Project Number: 153-1406-0		(Л9) O}		MATRIX COD	MT 0	WT 0		WT 0	TW	ŢW	Ţ	ŢW	TW	TW .		RELING	10 H	Querel	dian					
Sect	Repo	ay Drive, Ste 260 Copy To:			Fax 636-724-9323 Project			Valid Matrix Codes MATRIX CODE	DW WATER DW WASTE WATER WAT WASTE WATER WATER WASTE WA		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	2-4-12-2	fents								
Section A Required Client Information:	Golder Associates	13515 Barrett Parkway Drive, Ste 260	Ballwin, MO 63021	jeffrey ingram@golder.com	636-724-9191 Fax 6	Requested Due Date/TAT: Standard		Section D Required Client Information	SAMPLE ID	(A-2, 0-9' , -) Sample IDs MUST BE UNIQUE	n-s	l-S	S-L	-S-L	S-I	S-I	S-SCP	S-SCF	S-BI	S-BA	0-5	ADDITIONAL COMMENTS	-EPA 200 7: B, Ca, Fe, Mg, Mn, K, Na							
Section A Required Cli	Company:	Address:		Email To:	Phone: 63	Requested L		R S		# MƏTI	2.	24	32	424	52	6	724	8	თ	10	11	121	*EPA 200 7:							



Sample Condition Upon Receipt

### WO#:60310790

Client Name: Golder		
Courier: FedEx 🗆 UPS 🗆 VIA 🗆 Clay 🗆	PEX 🗆 🛛 ECI 🗆	Pace 🗆 Xroads 🗖 Client 🗆 Other 🗇
Tracking #: Pac	e Shipping Label Used	j? Yes □ No
Custody Seal on Cooler/Box Present: Yes No 🗆	Seals intact: Yes	No 🗆
Packing Material: Bubble Wrap D Bubble Bags	Foam	None  Other
Thermometer Used: <u>K-294</u> Type of	fice: Wet Blue Nor	ne
Cooler Temperature (°C): As-read <u>2,6, 2,0</u> Corr. Fact	corCorrect	Date and initials of person examining contents: (3)71
Temperature should be above freezing to 6°C		
Chain of Custody present:	Ves 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):	DYes No DN/A	
Rush Turn Around Time requested:		
	ZYes No N/A	
Sufficient volume:		-
Correct containers used:	ZYes □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 ØN/A	No volume for analysis
Sample labels match COC: Date / time / ID / analyses	N/A	total showhows.
Samples contain multiple phases? Matrix:	DYes No DN/A	4 - 1
Containers requiring pH preservation in compliance?	Yes No N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO₃, H₂SO₄, HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide)	Ł	
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) 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):		
Samples from USDA Regulated Area: State:	DYes DNO DNA	
Additional labels attached to 5035A / TX1005 vials in the field	? DYes DNO DNA	
Client Notification/ Resolution: Copy COC	to Client? Y 🖉 N	Field Data Required? Y / N
Person Contacted: Date/	Time:	
Comments/ Resolution:		
Janui Chush		
Project Manager Review:	Dat	e

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	Analy	www.pace/abs com
C	Pace	
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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.

Sec	Section A Required Client Information:		Section B Required Project Information:	ect Info	ormation:					Section C Invoice Information:	n C Informé	ation:						1					Page:		of	
Com	Company: Golder Associates		Report To: Jeffrey Ingram	ffrey	Ingram					Atlention:	ë											ļ		-		
Address:		13515 Barrett Parkway Drive, Ste 260	Copy To: Ry	yan F	Ryan Feldmann/E	n/Eric St	cric Schneider			Company Name	ny Nar	ie:						æ	EGUL	ATOR	REGULATORY AGENCY	ICY	$\left( \right)$	F		
	Ballwin, MO 63021	021								Address:	10								ď	NPDES	G	GNND	GROUND WATER		DRINKING WATER	WATER
Ema	Email To: jeffrey ingram@golder.com		Purchase Order No.:	er No.:						Pace Quote Reference:	iole :e:								UST	F	RC	RCRA		0	OTHER	
Phone:	636-724-9191	Fax: 636-724-9323	Project Name:		meren Si	ioux En	Ameren Sioux Energy Center	ler		Pace Pri Manager	oject		Jamie Church	ırch					Site Lo	Site Location						
Req	Requested Due Date/TAT: \$	Standard	Project Number: 153-1406-01	ər: 15	53-1406-		.0003B (COC#6)	<del>t</del> 6)		Pace Pro	ofile #	9285						Γ	S	STATE:	ķ	M				
															H	æ	senbe	ted A	nalysi:	s Filter	Requested Analysis Filtered (Y/N)					
	Section D Required Client Information	Valid Matrix Codes MATRIX CO			()	Ö	COLLECTED	G				Pres	Preservatives	sə,	<b>€</b> N /A	z	z z	z	z							
		DRINKING WATER WATER WASTE WATER PRODUCT SOL/SOLID OIL	WT WWT S? PW	3RAB C=CO	00=0 8∀Я€	COMPOSITE START		COMPOSITE END/GRAB		S	-				1		ətatlu2\e		s		l		(N/A) =			1
# Wild	SAMPLE ID (A.Z. 0-9/) Sample IDs MUST BE UNIQUE	1	AR AR TS		MPLE TYPE (G=0				AMPLE TEMP AT C	OF CONTAINER.	<sup>5</sup> 20* ubtesetneg	€ON	90H CI	a <sub>z</sub> S <sub>z</sub> O <sub>3</sub> lonaria	ther Analysis Test	*slst9	DS bloride/Fluoride	kalinity	uronqeori9 leto				soridual Chlorine	C	101	NOLOVENN
<u>"</u> [	ш	S-LMW-1S		-	G 2/U	1	TIME DA	DATE TIME				H A	N	N	_	W -	-	∀		282	i i	15 95	11	BROW	LOJECT N	PON 001
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	4	S-LMW-4S	>	μ.	U			7			4				Т		-							1		
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	đ	S-LMW-9S	>	TW TW	0			1					_		1				1		-1		_			000
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1		S-LMW-DUP-1	>		0				-																	
L	ADDITIONA	ADDITIONAL COMMENTS	œ	ELING	RELINQUISHED BY		A AFFILIATION		DATE	F	TIME			ACCEPTED BY / AFFILIATION	TED B	Y I AFF	ILIATIO	z	_	DATE	TIME			SAMPL	SAMPLE CONDITIONS	ONS
μ	EPA 200.7: B, Ca, Fe, Mg, Mn, K, Na	. Na	Z	R	6	601	older	R	72/19	163	5	X	N	N					C.	MEND	2250		2:2	7	λ	2
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							PRIN	PRINT Name of SAMPLER:	AMPLER.		KXan	LL	- 1chr	1010	5								ui qn	) evie (\Y) e	ier (Y	(N/X)
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										1	\$	1	5	5		1	MULTIN	115	5	-		1	1	1		

Pace Analytical Sample Condition	Upon Receipt	WO#:60310790
Client Name: Golder Assoc.		
Courier: FedEx 🗆 UPS 🗆 VIA 🗆 Clay 🗆	PEX 🗆 ECI 🗆	Pace 🗆 Xroads Client 🗆 Other 🗆
	ace Shipping Label Used	
Custody Seal on Cooler/Box Present: Yes 😾 No 🗆	Seals intact: Yes	
Packing Material: Bubble Wrap  Bubble Bage		None Other Cp/C
	of Ice: Wet Blue Nor	Data and initials of nancan
Cooler Temperature (°C): As-read $6.2$ Corr. Fa		ed 0.2 Date and initials of person examining contents: 8 -> -19 14
Temperature should be above freezing to 6°C O. C 1000.	. /	0.6,1.0,0.3
Chain of Custody present:	Yes No N/A	
Chain of Custody relinquished:		
Samples arrived within holding time:	Yes No N/A	
Short Hold Time analyses (<72hr):		
Rush Turn Around Time requested:	□Yes KNo □N/A	
Sufficient volume:	Yes No N/A	
Correct containers used:		
Pace containers used:	Yes No N/A	
Containers intact:		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?		
Filtered volume received for dissolved tests?		
Sample labels match COC: Date / time / ID / analyses		
Samples contain multiple phases? Matrix: WT	Ves No DN/A	
Containers requiring pH preservation in compliance? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		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:		
Headspace in VOA vials ( >6mm):		
Samples from USDA Regulated Area: State:	□Yes □No AN/A	
Additional labels attached to 5035A / TX1005 vials in the fie	d? Dyes DNo, XN/A	
	C to Client? Y / N	Field Data Required? Y / N
Person Contacted: Date	e/Time:	
Comments/ Resolution:		
Project Manager Review:	Date	8/8/19

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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.

ection A       Section B         entimedicient Information:       Section B       Section C       Sectin					
Report To: Jeffrey Ingram     Artention.       Activition.     Artention.       Ste 260     Copy To: Ryan Feldmann/Eric Schneider       Company Name:     Company Name:       Protect Number:     Protect       Project Number:     Total       Project Number:     T33-1406-01 0003B (COC#6)       Project Number:     T33-1406-01 0003B (COC#6)	Section A Required Client Information:		Section B Required Project Information:	Section C Invoice Information:	of
13515 Barrett Parkway Drive, Ste 260     Copy To: Ryan Feldmann/Eric Schneider     Company Name:     REGULATORY AG       Ballwin, MO 63021     Address:     Address:     NPDES       Jeffrey Ingram@golder.com     Parce outor     Parce outor     NPDES       5-724-9191     Fax: 636-724-9323     Project Name: Ameren Sioux Energy Center     Parce Prodite & Jamie Church     Site Location       ue DaterAT:     standard     Project Number: 153-1406-01.0003B (COC#6)     Parce Prodite # 9285     Site Location	ompany: Golder As.		Report To: Jeffrey Ingram	Attention:	
Ballwin, MO 63021     Address:     Address:     NPDES       jeffrey ingram@golder.com     Pare oute     Pare oute     NPDES       5-724-9191     Fax: 636-724-9323     Project Name: Ameren Sioux Energy Center     Pare Project Jamie Church     Ste Location       ue DaterTAT:     standard     Project Number: 153-1406-01.0003B (COC#6)     Pare Project Sioux     Stat		rett Parkway Drive, Ste 260	Copy To: Ryan Feldmann/Eric Schneider	Company Name:	REGULATORY AGENCY
jeffrey ingram@golder.com Purchase Order No.: Pare Guete Anterine: Pare Guete Unit Revenue UST RCRA 5-724-9191 Fax: 636-724-3323 Project Name: Ameren Sioux Energy Center Pare Project Jamie Church Site Location Manager. Ue DaterTAT: Standard Project Number: 153-1406-01.00038 (COC#6) Pare Proine # 9285 S1 S1 S1 Provine # S1ATE: MO	Ballwin, M	O 63021		Address:	V
Fax: 636-724-9323         Project Name:         Ameren Sioux Energy Center         Pace Project Jamie Church         Stell           standard         Project Number:         153-1406-01.0003B (COC#6)         Pace Profile #: 9285         9285	nail To: jeffrey ing	ram@golder.com	Purchase Order No.:	Pace Quote Reference	RCRA
Standard Project Number: 153-1406-01 0003B (COC#6) Pace Profile #: 9285	hone: 636-724-9191		Project Name: Ameren Sioux Energy Center	Pace Project Jamie Church Manager:	Site Location
	equested Due Date/TAT:		Project Number: 153-1406-01.0003B (COC#6)	Pace Profile # 9285	STATE: MU

Reques	Requested Due Date/IAT: Standard	Project Number: 153-1406-01	oer: 153	-1406-01	0003B (COC#6)	COC#6)		Pace Profile #	100 10	9285					STATE:	, E		-				
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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:	ion:	Section B Required Project Information:	Section C Invoice Information:		Page: 2 of 2
Company: Golder Associates		Report To: Jeffrey Ingram	Attention:		
Address: 13515 B	13515 Barrett Parkway Drive, Ste 260 Copy To: Ryan Feldmann/Er	Copy To: Ryan Feldmann/Eric Schneider	Company Name:	REGULATORY AGENCY	r AGENCY
Ballwin,	Ballwin, MO 63021		Address:	NPDES	GROUND WATER DRINKING WATER
Email To: jeffrey i	jeffrey ingram@golder.com	Purchase Order No.:	Pace Quote Reference	UST	RCRA OTHER
Phone: 636-724-9191	91 Fax 636-724-9323	Project Name: Ameren Sioux Energy Center	Pace Project Jamie Church	Site Location	
Requested Due Date/TAT:	T: Standard	Project Number: 153-1406-01.0003B (COC #6)	Pace Profile #. 9285	STATE:	DW
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	Section D Valid Matrix Codes Required Client Information MATRIX COL	ΨĮ		(HMC		COLLECTED	CTED				Pre	Preservatives	tives		1 N /A	z z	z	z z											
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Sample Condition Upon Receipt

### W0#:60310790 60310790

Client Name: Golder		
Courier: FedEx 🗆 UPS 🗆 VIA 🗆 Clay 🗆	PEX 🗆 ECI 🗆	Pace 🗆 Xroads 🖉 Client 🗆 Other 🗆
Tracking #: Pa	ce Shipping Label Use	d? Yes □ No 🗖
Custody Seal on Cooler/Box Present: Yes 🖉 No 🗆	Seals intact: Yes	No 🗆
Packing Material: Bubble Wrap  Bubble Bags	1	None  Other
Thermometer Used: <u>1-294</u> Type of	of Ice: Wet Blue No	Date and initials of person
Cooler Temperature (°C): As-read <u>2,2</u> Corr. Fac	tor <u>ノン</u> Correct	examining contents: 51/01/9
Temperature should be above freezing to 6°C	/	
Chain of Custody present:	Yes No N/A	
Chain of Custody relinquished:		
Samples arrived within holding time:	Yes No N/A	
Short Hold Time analyses (<72hr):	Yes No N/A	
Rush Turn Around Time requested:	DYes No DN/A	
Sufficient volume:	Hes 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 ANA	
Filtered volume received for dissolved tests?		
Sample labels match COC: Date / time / ID / analyses	Yes No N/A	
Samples contain multiple phases? Matrix:		
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide)		List sample IDs, volumes, lot #'s of preservative and the date/time added.
(Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) 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 DN/A	
Headspace in VOA vials ( >6mm):	Yes No DN/A	
Samples from USDA Regulated Area: State:	TYes No DN/A	
Additional labels attached to 5035A / TX1005 vials in the field	? 🛛 Yes 🗆 No 🗍 N/A	
Client Notification/ Resolution: Copy COC 1	to Client? Y // N	Field Data Required? Y / N
Person Contacted: Date/	Time:	
Comments/ Resolution:		
Janni Churh		8/13/19
Janu Church	2	

Project Manager Review:

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Date:

# CHAIN-OF-CUSTODY / Analytical Request Document

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Section B	Require	Report To: Jeffrey	Copy To	(	Purchas	Project Name: A weren	Project		odes	r WV SL PW	AR AR OT AR VOL											/		ľ			
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	÷	Solder Associates	Address: 3515 Rarcett Parkury V. Ste 20 00 To: Ryon Feldinowin	9	5				io		SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE		-inn-										ADDITIONAL COMMENTS				
	Required Client Information:	der	Bre	WO	2-1-	1919-724-9191	Requested Due Date/TAT:		Section D Required Client Information		SAMPLE ID (A-Z, 0-9 / ,-) sie IDs MUST BE UN		M			1	1			/			DITIO				
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9 00	ired (	Company:	less:	Sal	il To:	Phone:	uester		Section D Required Cl		Sa											1					

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 involces not paid within 30 days.

Samples Intact (V/Y)

Custody Sealed Cooler (Y/N)

Received on Ice (Y/N)

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DATE Signed (MM/DD/YY):

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SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: SIGNATURE of SAMPLER:

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Page 37 of 37

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F-ALL-Q-020rev 07, 15-May-2007



### **MEMORANDUM**

Project No. 1531406

DATE October 17, 2019

TO Project File Golder Associates

**CC** Amanda Derhake, Jeff Ingram

**FROM** Tommy Goodwin

EMAIL Tommy\_Goodwin@golder.com

### DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER - SCPC - DATA PACKAGE 60312389

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 MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was detected in a blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Compa	ny Name: Golder Associates		Proj	oct Manag	er: JIngram
Project	Name: Ameren - Sioux - SCPC				er: 1531406
	er: T Goodwin				e: 10/17/2019
Laborat	ory: Pace Analytical - KS		SDG	; #: 603123	89
	cal Method (type and no.): EPA 200.7 (Metals); SM 232	 0B (Alk);			
-	Air Soil/Sed. Water Waste				
Sample	Names S-UG-1A, S-UG-2, S-DG-1, S-DG-2, S-DG-3, S-D	G-4, S-S	SCPC-DUF	P-1, S-SCP	C-FB-1, S-BMW-1S, S-BMW-3S
NOTE:	Please provide calculation in Comment areas or	on the	back (if	on the ba	ck please indicate in comment areas).
Field Ir	formation	YES	NO	NA	COMMENTS
a)	Sampling dates noted?	×			8/1 and 8/19/2019
b)	Sampling team indicated?	×			
c)	Sample location noted?	×			
d)	Sample depth indicated (Soils)?			×	······································
e)	Sample type indicated (grad)composite)?	×			
f)	Field QC noted?	×			
g)	Field parameters collected (note types)?	×			pH, Sp.Cond, ORP, Temp, DO, Turb
h)	Field Calibration within control limits?	×			
i)	Notations of unacceptable field conditions/performa	nces fro	om field lo	ogs or field	d notes?
	×		×		
j)	Does the laboratory narrative indicate deficiencies?			×	
	Note Deficiencies:				
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS
a)	Was the COC properly completed?	×			
b)	Was the COC signed by both field and laboratory personnel?	×			

x

YES

x

х

х

X

x

х

NO

NA

See Notes

General	(reference	QAPP	or Method)
	•		,

a)	Were hold times met for sample pretreatment?
b)	Were hold times met for sample analysis?

c) Were samples received in good condition?

-,	
c)	Were the correct preservatives used?

d)	Was the correct method used?
ω,	

e)	Were approp	riate reporting	limits	achieved?
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f)	Were any sample dilutions noted?	
·/	were any sample unutions noted:	

g)	Were any matrix problems noted?		×	
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COMMENTS

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blanks	i de la construcción de la constru	YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?	×			See Notes
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)?			×	
Labora	tory 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?	×			
Duplic	ates	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and de	uplicate	sample na	ames)?	DUP-1 @ S-DG-3
		×			FB-1 @ S-UG-2
b)	Were field dup. precision criteria met (note RPD)?	×			See Notes
c) Were lab duplicates analyzed (note original and du			samples)?		
		×			-89006: Alk, TDS
d)	Were lab dup. precision criteria met (note RPD)?	×			See Notes
Blind Standards		YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,		×		
	analytes included and concentrations)?				
b)	Was the %D within control limits?			x	
Matrix	Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a)	Was MS accuracy criteria met?	x			
	Recovery could not be calculated since sample contained high concentration of analyte?			×	-
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:

MB: -90002-03: B (11.8); -89001-08: Ca (50.1)	
FB-1: Ca (51.9), Mg (14.1), TDS (16.0)	
Max analyzed Field Duplicate RPD: 4.4% (Limit: 20%)	
Max analyzed Lab Duplicate RPD: 5% (Limit: 10%)	
Dilution: Chloride and Sulfate were diluted in several samples; no qualification is necessary.	

### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

### **Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-SCPC-FB-1	Calcium (Ca)	200	U	Analyte Detected in Method Blank (MB); PQL>Result>MDL
S-BMW-1S	Boron (B)	100	U	"
S-BMW-3S	11	100	U	11
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Signature:	my ford			Date: 10/17/2019
	II Y			

Revised May 2004



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

October 17, 2019

Jeffrey Ingram Golder Associates 13515 Barrett Parkway Drive Suite 260 Ballwin, MO 63021

RE: Project: AMEREN SIOUX ENERGY CTR SCPC Pace Project No.: 60317027

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on October 04, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Jami Church

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

Enclosures

cc: Ryan Feldmann, Golder Mark Haddock, Golder Associates Eric Schneider, Golder Associates





### CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

### **Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 19-016-0 Arkansas Drinking Water Illinois Certification #: 004455 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212018-1 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-18-11 Utah Certification #: KS000212018-8 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60317027001	S-UG1A	Water	10/02/19 12:45	10/04/19 02:55
60317027002	S-SCPC-DUP-1	Water	10/02/19 12:45	10/04/19 02:55
60317027003	S-UG-2	Water	10/02/19 11:15	10/04/19 02:55
60317027004	SCPC-FB-1	Water	10/02/19 11:25	10/04/19 02:55
60317027005	S-DG-3	Water	10/02/19 12:45	10/04/19 02:55



#### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.:	60317027
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Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60317027001	S-UG1A	EPA 200.7	LRS	1	PASI-K
		EPA 300.0	MGS	1	PASI-K
60317027002	S-SCPC-DUP-1	EPA 200.7	LRS	1	PASI-K
		EPA 300.0	MGS	1	PASI-K
60317027003	S-UG-2	EPA 300.0	MGS	1	PASI-K
60317027004	SCPC-FB-1	EPA 200.7	LRS	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	2	PASI-K
60317027005	S-DG-3	SM 2540C	MAP	1	PASI-K



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 6031702

ct No ·	60317027	

Sample: S-UG1A	Lab ID:	60317027001	Collected	d: 10/02/19	9 12:45	Received: 10/	04/19 02:55 M	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical I	Method: EPA 2	00.7 Prepa	ration Meth	nod: EP/	A 200.7			
Calcium	166000	ug/L	200	50.0	1	10/11/19 14:00	10/14/19 14:54	7440-70-2	
300.0 IC Anions 28 Days	Analytical I	Method: EPA 3	00.0						
Chloride	140	mg/L	10.0	2.2	10		10/16/19 11:02	16887-00-6	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

Sample: S-SCPC-DUP-1	Lab ID:	60317027002	Collecte	d: 10/02/19	9 12:45	Received: 10/	04/19 02:55 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	aration Meth	od: EP	A 200.7			
Calcium	164000	ug/L	200	50.0	1	10/11/19 14:00	10/14/19 15:02	7440-70-2	
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	139	mg/L	10.0	2.2	10		10/16/19 11:19	16887-00-6	



Project: Pace Project No.:	AMEREN SIOU 60317027	JX ENERGY C	TR SCPC							
Sample: S-UG-2		Lab ID:	60317027003	Collected	d: 10/02/19	9 11:15	Received: 10/	04/19 02:55 Ma	atrix: Water	
Parame	eters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28	3 Days	Analytical	Method: EPA 3	00.0						
Fluoride		0.30	mg/L	0.20	0.085	1		10/15/19 18:36	16984-48-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

Sample: SCPC-FB-1	Lab ID:	60317027004	Collecte	d: 10/02/19	11:25	Received: 10/	/04/19 02:55 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	PA 200.7			
Calcium	<50.0	ug/L	200	50.0	1	10/11/19 14:00	10/14/19 15:04	7440-70-2	
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		10/08/19 15:19		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	<0.22	mg/L	1.0	0.22	1		10/15/19 18:53	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		10/15/19 18:53	16984-48-8	



Project: Pace Project No.:	AMEREN SIO 60317027	UX ENERGY C	TR SCPC							
Sample: S-DG-3		Lab ID:	60317027005	Collecte	d: 10/02/19	9 12:45	Received: 10/	04/19 02:55 Ma	atrix: Water	
Parame	eters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Disso	lved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Soli	ids	569	mg/L	10.0	10.0	1		10/08/19 15:20		



Project:	AMEREN SIOUX	ENERGY CTR SO	CPC									
Pace Project No .:	60317027											
QC Batch:	615188		Analy	sis Metho	d:	EPA 200.7						
QC Batch Method:	EPA 200.7		Analy	/sis Descri	ption:	200.7 Metal	s, Total					
Associated Lab San	nples: 60317027	2001, 6031702700	2, 6031702	27004								
METHOD BLANK:	2511571			Matrix: W	ater							
Associated Lab San	nples: 60317027	7001, 6031702700	2, 6031702	27004								
			Blar	nk	Reporting							
Paran	neter	Units	Res	ult	Limit	MDI	-	Analyzed	Qı	ualifiers		
Calcium		ug/L		<50.0	20	00	50.0 1	10/14/19 14:	47			
LABORATORY CON		2511572										
Paran		Units	Spike Conc.	LC Res		LCS % Rec	% F Lin		Qualifiers			
Calcium		ug/L	1000	00	10100	10 <sup>7</sup>	1	85-115		_		
MATRIX SPIKE & M	IATRIX SPIKE DUI	PLICATE: 2511	573		2511574	4						
			MS	MSD								
Parameter	· Units	60317027001 s Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	166000	10000	10000	176000	176000	99	9 92	70-130	0	20	
MATRIX SPIKE SAM	MPLE:	2511575										
				068001	Spike	MS		MS	% Rec			
Paran	neter	Units	Re	sult	Conc.	Result		% Rec	Limits		Qualif	iers
Calcium		ug/L		138000	10000	145	000	69	70	-130 M	1	

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.



Project: AMEREN SIOUX	ENERGY CTR SC	CPC					
Pace Project No.: 60317027							
QC Batch: 614091		Analysis Me		SM 2540C			
QC Batch Method: SM 2540C		Analysis De	escription: 2	2540C Total D	issolved Solids		
Associated Lab Samples: 60317027	004, 6031702700	5					
METHOD BLANK: 2507725		Matrix	: Water				
Associated Lab Samples: 60317027	004, 6031702700	5					
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Analyz	zed Qualifiers	
Total Dissolved Solids	mg/L	<5.0	5.0	0	5.0 10/08/19	15:18	
LABORATORY CONTROL SAMPLE:	2507726						
		Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers	
Total Dissolved Solids	mg/L	1000	982	98	80-120		
SAMPLE DUPLICATE: 2507728							
		60317050012	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Dissolved Solids	mg/L	47100	4540	)	4	10	
SAMPLE DUPLICATE: 2507743							
		60317050008	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD	Qualifiers	
Total Dissolved Solids	mg/L	947	95		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.



Project: Pace Project No.:	AMEREN SIOUX 60317027	ENERGY CTR S	CPC									
QC Batch:	614196		Analy	sis Metho	d:	EPA 300.0						
QC Batch Method:	EPA 300.0		Analy	sis Descri	ption:	300.0 IC An	ions					
Associated Lab San	nples: 60317027	7001, 6031702700	02, 60317027	7003, 603	17027004							
METHOD BLANK:	2508100			Matrix: W	ater							
Associated Lab San	nples: 60317027	7001, 6031702700	02, 60317027	7003, 603	17027004							
			Blan	k	Reporting							
Paran	neter	Units	Resu	ılt	Limit	MD	L	Analyzed	Qu	alifiers		
Chloride		mg/L		<0.22	1	.0	0.22 1	10/15/19 15:	08			
Fluoride		mg/L	<	:0.085	0.2	20	0.085 1	10/15/19 15:	08			
LABORATORY COM	ITROL SAMPLE:	2508101										
			Spike	LC	s	LCS	% F	Rec				
Paran	neter	Units	Conc.	Res	sult	% Rec	Lin	nits (	Qualifiers			
Chloride		mg/L		5	4.6	9	2	90-110		_		
Fluoride		mg/L	2.8	5	2.4	9	7	90-110				
MATRIX SPIKE & M	ATRIX SPIKE DUI	PLICATE: 2508	3102		250810	3						
			MS	MSD								
		60317026001	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Unit	s Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/l	22.1	10	10	34.2	32.5	121	1 105	80-120	5	15	M1

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



#### QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

#### 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.

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

TNI - The NELAC Institute.

#### LABORATORIES

PASI-K Pace Analytical Services - Kansas City

#### ANALYTE QUALIFIERS

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



#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60317027

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60317027001	S-UG1A	EPA 200.7	615188	EPA 200.7	615295
60317027002	S-SCPC-DUP-1	EPA 200.7	615188	EPA 200.7	615295
60317027004	SCPC-FB-1	EPA 200.7	615188	EPA 200.7	615295
60317027004	SCPC-FB-1	SM 2540C	614091		
60317027005	S-DG-3	SM 2540C	614091		
60317027001	S-UG1A	EPA 300.0	614196		
60317027002	S-SCPC-DUP-1	EPA 300.0	614196		
60317027003	S-UG-2	EPA 300.0	614196		
60317027004	SCPC-FB-1	EPA 300.0	614196		



Sample Condition Upon Receipt

# WO#:60317027

Client Name: Golder Associates		
Courier: FedEx UPS VIA Clay PI	EX 🗆 ECI 🗆	Pace 🗆 Xroads 🖅 Client 🗆 Other 🗆
Tracking #: Pace	Shipping Label Used	d?Yes 🗆 No 🗹
Custody Seal on Cooler/Box Present: Yes I No 🗆	Seals intact: Yes 🗈	No 🗆
Packing Material: Bubble Wrap  Bubble Bags	Foam 🗆	None Other J Zpic
Thermometer Used: 1-301 Type of I	ce: Wat Blue No	
Cooler Temperature (°C): As-read O·1 Corr. Facto	r <u>+0.0</u> Correct	ted 0 · 1 Date and initials of person examining contents: 101.19
Temperature should be above freezing to 6°C		1
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 MNo □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 𝗖No □N/A	
Containers requiring pH preservation in compliance?	Yes 🗆 No 🗆 N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
(HNO₃, H₂SO₄, HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		date/ame 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 ĽN/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/Tir	ne:	
Comments/ Resolution:		
		10/8/19
Project Manager Review:	Date	

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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.

	Retarget WITER DW WATER WW WATE WATER WW WW REQUELTE THOM SOLUCION	Valid Matrix Codes         #         D         D         D         Preservatives           Interface         20 DE	DRINKING WATE OTHER OTHER Pace Project No/Lab		GULATORY AGE       GULATORY AGE       UST       UST       STATE:       STATE:       STATE:       STATE:       STATE:       O <t< th=""><th>P         Coloride         Z&lt;</th><th>mation: HCI Society State Children HCI State Children HCI Society State Ch</th><th></th><th></th><th>COLLE COLLE COLLE ARPOSITE TARE TARE TIME COLLE</th><th>Report To:     Report To:       Report To:     Leffrey Ingram       Report To:     Leffrey Ingram       Report To:     Ryan Feldmann       Project Name:     Ameren       Project Name:     Ameren       Project Name:     Ameren       Report To:     Ryan Feldmann       Project Name:     Ameren       Report To:     Recomment       Project Name:     Ameren       Recomment     Same:       Recomment</th><th>Report To: Copy To: Project Nur Project Nu</th><th>sociates rrett Parkway Dri Io 63021 I o 63021 Fax 636-72 standard Daf (-) Standard Daf (-) Standard</th></t<>	P         Coloride         Z<	mation: HCI Society State Children HCI State Children HCI Society State Ch			COLLE COLLE COLLE ARPOSITE TARE TARE TIME COLLE	Report To:     Report To:       Report To:     Leffrey Ingram       Report To:     Leffrey Ingram       Report To:     Ryan Feldmann       Project Name:     Ameren       Project Name:     Ameren       Project Name:     Ameren       Report To:     Ryan Feldmann       Project Name:     Ameren       Report To:     Recomment       Project Name:     Ameren       Recomment     Same:       Recomment	Report To: Copy To: Project Nur Project Nu	sociates rrett Parkway Dri Io 63021 I o 63021 Fax 636-72 standard Daf (-) Standard Daf (-) Standard
1	SAMPLE ID         SAMPLE ID         SAMPLE ID           MAXTRELID         MAXTRELID         MAXTRELID         MAXTRELID           MAXTRELID         MAXTRELID         MAXTRELID         MAXTRELID           MAXTRELID         MAXTRELID         MAXTRELID         MAXTRELID           MAXTRELID         MATCRELID         MATCRELID         MATCRELID           MAXTRELID         MATCRELID         MATCRELID         MATCRELID           MAXTRELID         MATCRELID         MATCRELID         MATCRELID           MAXTRELID         MATCRELID         MATCRELID         MATCRELID           MATCRELID	SAMLE ID	4) (1) (1) (1) (1) (1) (1) (1) (1) (1) (1	o° n				ATURE	SAMPLER NAME AND SIGNATURE	SAMPLER			
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MMMMM [10]3/19/13:36 EBrackett Pace 10/4/19 6255	SAMPLE ID         SAMPLE TO         <	SAMPLE ID		+			•	-	1015.			3	
MMMM [10]319 13:36 EBrakett Pare 10/19 6255	SAMPLE ID alle UX 261-12 mage UX 261-12 mag	Rementance memory memory second sec		5	3 19 1	3	2 unge	153	1	AN I	Much	Ummi	
Multiports/border 01319 1333 UMGela Nu - 10/3/19 13:35 Na Mamu 10/3/19 13:36 EBrockett Pace 10/1/19 6255	Замист и соверни совер	Merenandia Merenandi Merenandi Merenandia Merenandia Merenandia Merenandia Merenandia	SAMPLE CONDITIONS	ų	_	ED BY / AFFILIATION	ACCEPTI	_	DAT		RELINQUISHED B	10 11 11 11 11 11 11 11 11 11 11 11 11 1	ADDITIONAL COMMENTS
RELINQUISHED BY IAFFILATION DATE THE ACCEPTED BY IAFFILATION DATE TIME Annie Much Porth / border 01314 13:33 angle a Mu - 101314 13:35- angle Manue 101314 13:34 E Brakett Pace 101419 6255 0.1	Same     Same       and     and       and     a	Market Discrete State         SAMPLE ID         SAMPLE Discrete State         SAMPLE Discrete State           Witter Witter Discrete State         Witter Discrete State         0.00001         55.00         57.00         5		4	+		_	-			WT G		
Wr a mr a me me accertebriation de me al 3/19/3355 and a manual metal of a me al	Market Bill       Market Bill	Minimum Minimu		1									
WT 6 WT 8 RELINQUENED BY AFFILIATION DATE THE ACCEPTED BY AFFILIATION DATE THE AMOUNTED BY AFFILIATION DATE THE THE ACCEPTED BY AFFILIATION DATE THE AMOUNT MUNITURY (1737) 333 AMOUNT 10/3/14 3:35 - 1 1	American Market In the second state of the secon	Marrie Marri Marrie Marrie Marrie Marrie Marrie Marrie Marrie Marrie Marrie									-		~
WT     B       WT     G       W     G       W     G       W     G       W     G       W     G       W     G       W     G       W     G       W     G       W     G       W     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G       M     G  <	SAMPLE ID       Provide in Market ID       Provide in Market ID	SAMPLE ID SAMPLE SAMPL							1	1	_		
WT     C       WT <td>AMPLE       AMPLE       AMPLE    <t< td=""><td>Министрани         SAMPLE ID         Констенствон           Министрани         В Министрани         В Министрани         В Министрани         В Министрани           Министрани         В Министрани&lt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>M O</td><td></td><td></td></t<></td>	AMPLE       AMPLE <t< td=""><td>Министрани         SAMPLE ID         Констенствон           Министрани         В Министрани         В Министрани         В Министрани         В Министрани           Министрани         В Министрани&lt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>M O</td><td></td><td></td></t<>	Министрани         SAMPLE ID         Констенствон           Министрани         В Министрани         В Министрани         В Министрани         В Министрани           Министрани         В Министрани<									M O		
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WT     Column     Column       WT     6       WT     6   <	SAMPLE ID	Martine SAMPLE ID Mersonantia Martine With Martine With Martin Martine With Martine With Martine With Martine With Martine W	500						1 #00				· D6-3
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NC-F8-1         Wr         Wr         L         HOW	SAMPLE ID	MARRIER WITE WWW WARRIER WWW WWARRIER WWW WWARRIE WWW WWWARRIE WWW WWW WWW WWW WWW WWW WWW WWW WWW W	(Jac)					1	1115				u6-2
UC     R     Image     Image     Image     Image     Image     Image     Image       OG     Image       MC     F8<-1     Image     Image <t< th=""><td>الجال       الجال       الجال</td><td>Виликия Макимани Макимани Визования Ви</td><td>607</td><td></td><td></td><td>( )</td><td>/</td><td>10</td><td>1</td><td></td><td>-</td><td></td><td>-Scpc - Dup -</td></t<>	الجال	Виликия Макимани Макимани Визования Ви	607			( )	/	10	1		-		-Scpc - Dup -
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Indext         Protection         State	Standard     Project Number.     [5]     [6] <td>Standard Project Number. 153140601.0003 Pace Profile #: 9285 STATE: A</td> <td></td> <td>OW</td> <td>te Location</td> <td>St</td> <td></td> <td>Pace Project Manager.</td> <td></td> <td></td> <td>e Ameren</td> <td></td> <td></td>	Standard Project Number. 153140601.0003 Pace Profile #: 9285 STATE: A		OW	te Location	St		Pace Project Manager.			e Ameren		
Terrer         Terrer         Second         Terrer         Limit Cutrt         Decret         Limit Cutrt         Mode	Fax: 635-724-9323     Project Name:     Sc P U     Pare Project Jamie Church     Site Location       Standard     Project Number:     5314/0 U/0 3     Pare Project Sindard     Standard       Standard     Project Number:     5314/0 U/0 3     Pare Project Sindard     Standard       Manager:     Project Number:     5314/0 U/0 3     Pare Project Sindard     Standard       Manager:     Project Number:     5314/0 U/0 3     Pare Project Number:     Standard       Manager:     0     Prosecution     Requested Analysis Filtered (YIN       Manatix     CODE     2     N     N     N     N	Fax: 636-724-9323     Project Name:     Ameren     SCPL     Pare Project     Jamie Church     Site Location       Standard     Project Number:     JG3140601.0003     Pare Project     2855     STATE:	OTHER	ICRA				Pace Quote Reference			der No.:		gram(
Image: definition in the one (No.)	ITERIM@Golder.com Fax 636-724-9323 Project Name: Ameren SCPC Pase Project Jamie Church Site Location MO Standard Project Number: [531496.0].0003 Pase Project Jamie Church Site Location MO Standard Project Number: [531496.0].0003 Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Amager: Amager: Ameren SCPC Pase Project Jamie Church Site Location MO Amager: Stanta Collecter Site Amager: Ama	Trant@golder.com         Purchase Order No.:         Des Outlee         UST         RCRA           Fax         636-724-9323         Project Name:         Ameren         S.C.P.C         Pase Project         Jamie Church         Site Location         MO           Fandard         Project Number:         J53140 Loft         Pase Project         Jamie Church         Site Location         MO           Standard         Project Number:         J53140 Loft         Pase Project         Ameren         S.C.P.C         Pase Project         Site Location         MO	$\wedge$	ROUND W	M			Address:					Ballwin, MO 63021
Control         Metric         Control         Control <t< th=""><td>ID 63021     NPDES     GROUND WATER       Iraim@older.com     Purchase Order No::     Peee Quie     UST     GROUND WATER       Fax: 635-724-9323     Project Name:     America     Peee Poile     UST     RCRA       Fax: 635-724-9323     Project Name:     America     Peee Poile     Jamie Church     Site Location     MO       Fax: 635-724-9323     Project Name:     America     Proper Jamie Church     Site Location     MO       Standard     Project Number:     Jamie Church     Retences     Site Location     MO       Amage:     Mo     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Site Location     MO     MO       Amage:     Proservatives     Z     N     N     N     N</td><td>ID 63021     NPDES     GROUND WATER       Iram@dolder.com     Purchase Order No.:     Paee Quote     UST     RCRA       Face 636-724-9323     Project Number: American     Site Location     MO       Face forder     Paee Profile # 9285     Site Location     MO       Standard     Project Number: 153140 6.01 m/0 3     Paee Profile # 9285     Site Location</td><td></td><td>NCY</td><td>GULATORY AGE</td><td>RE</td><td>ame:</td><td>Company N</td><td></td><td></td><td>Ryan Feldmann</td><td>Copy To:</td><td>13515 Barrett Parkway Drive, Ste</td></t<>	ID 63021     NPDES     GROUND WATER       Iraim@older.com     Purchase Order No::     Peee Quie     UST     GROUND WATER       Fax: 635-724-9323     Project Name:     America     Peee Poile     UST     RCRA       Fax: 635-724-9323     Project Name:     America     Peee Poile     Jamie Church     Site Location     MO       Fax: 635-724-9323     Project Name:     America     Proper Jamie Church     Site Location     MO       Standard     Project Number:     Jamie Church     Retences     Site Location     MO       Amage:     Mo     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Retences     Site Location     MO       Amage:     Jamie Church     Site Location     MO     MO       Amage:     Proservatives     Z     N     N     N     N	ID 63021     NPDES     GROUND WATER       Iram@dolder.com     Purchase Order No.:     Paee Quote     UST     RCRA       Face 636-724-9323     Project Number: American     Site Location     MO       Face forder     Paee Profile # 9285     Site Location     MO       Standard     Project Number: 153140 6.01 m/0 3     Paee Profile # 9285     Site Location		NCY	GULATORY AGE	RE	ame:	Company N			Ryan Feldmann	Copy To:	13515 Barrett Parkway Drive, Ste
Control Participantial Control	Treth Parkway Drive, Ste 260     Copy To:     Ryan Feldman/Eric Schneider     Company Name:     REGULATORY AGENCY       10 63021     Address:     Address:     Address:     NPDES     REGULATORY AGENCY       11 am@golder.com     Purchase Order No.:     Reference     NPDES     REGULATORY AGENCY       12 Fax     Borne     NPDES     RegULATORY AGENCY     NPDES     RECULATORY AGENCY       12 Fax     Borne     NPDES     Reference     NPDES     RECULATORY AGENCY       12 Fax     Borne     NPDES     Reference     NPDES     RCRA       12 Fax     G50-124-9323     Project Namer     NPDES     RCRA       13 Fax     Ammer     Ste Location     NCRA     NCRA       14 Fax     Ammer     Ste Location     NO     NO       15 Amodet     State     State     State     NO       16 Ammer     Managet     State     State     NO       17 Ammer     State     State     State     NO       18 Ammer     Face     State     State     NO     NO       18 Ammer     Managet     State     State     NO     NO     NO	Trett Parkway Drive, Ste 260     Copy To:     Ryan Feldmann/Eric Schneider     Company Name:     RECULATORY AGENCY       10 63021     Address     Address     Address     NPDES     GROUND WATER       10 63021     Purchase Order No:     Address     Address     NPDES     GROUND WATER       11 Fax. 636-724-9323     Project Name:     Ameren     SC P L     Address     NPDES     GROUND WATER       12 Fax. 636-724-9323     Project Name:     Ameren     SC P L     Ameren     Ster Location     MO       13 Fax. 636-724-9323     Project Number:     Jamie Church     Pace Project     Jamie Church     Ste Location     MO       15 Faxed ad     Project Number:     JGS J H U Logi NO O S     Pace Project     Jamie Church     Ste Location     MO						Attention:			Jeffrey Ingram	Report To:	Golder Associates
Contract         Resolution         Resolut	sociates Report To: Jeffrey Ingram Treft Parkway Drive, Ste 260 Coyr To: Ryan Feldmann/Eric Schneider Company Name: 10 63021 11 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9323 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 12 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 13 Fax 636-724-9329 Project Number. 65 Project Jamie Church Name: 14 Fax 636-724-7244444444444444444444444444444444	Golder Associates     Report To: Jeffrey Ingram     Attention:       13515 Barrett Parkway Drive, Ste 260     Copy To: Ryan Feldmann/Eric Schneider     Company Name:     RECULATORY AGENCY       Ballwin, MO 63021     ND 63021     RECULATORY AGENCY     NPDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Reculatory Adenes:     NDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Reculatory Adenes:     NDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Reculatory Adenes:     NDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Reculatory Adenes:     NDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Reculatory Adenes:     NDES     GROUND WATER       Ballwin, MO 63021     Durbrase Order No.:     Recentered Analysis Filtered (YIN)     MO       Ballwin, MO 63021     Fax 636-724-9323     Project Number: GS 140 Logi No.003     Prose Project Samader     MO       Ballwin Adate     Project Number: GS 140 Logi No.003     Prose Project Samader     State Adater     MO	1	Pag			imation:	Invoice Info			oject Information:	Required P.	Information:



#### **MEMORANDUM**

Project No. 1531406

DATE November 12, 2019

- TO Project File Golder Associates
- **CC** Amanda Derhake, Jeff Ingram
- **FROM** Tommy Goodwin

EMAIL Tommy\_Goodwin@golder.com

### DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPC – VERIFICATION SAMPLING - DATA PACKAGE 60317027

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: Golder Associates		Projec	ct Manager:	J Ingram
Project Name: Ameren - Sioux - SCPC			ct Number: _1	
Reviewer: T Goodwin			ation Date: 11	
Laboratory: Pace Analytical - KS		SDG	#: <u>60317027</u>	
Analytical Method (type and no.): EPA 200.7 (Metals); SM	2540C (TDS	); EPA 300	.0 (Anions)	
Matrix: Air Soil/Sed. 🔳 Water 🗋 Waster	• 🗆 _			· · · · · ·
Sample Names S-UG-1A, S-SCPC-DUP-1, S-UG-2, SCPC-FB	3-1, S-DG-3			
		L		
NOTE: Please provide calculation in Comment areas	or on the l	back (if o	n the back p	lease indicate in comment areas).
Field Information	YES	NO	NA	COMMENTS

1 10101		IL5	NO	11/1	COMIMENTS
a)	Sampling dates noted?	×			10/2/2019
b)	Sampling team indicated?	×			
c)	Sample location noted?	×			
d)	Sample depth indicated (Soils)?			×	
e)	Sample type indicated (grab)composite)?	×			
f)	Field QC noted?	×			
g)	Field parameters collected (note types)?	×			pH, Sp.Cond, ORP, Temp, DO, Turb
h)	Field Calibration within control limits?	×			
i)	Notations of unacceptable field conditions/performa	nces fro	om field lo	ogs or field	notes?
			×		
j)	Does the laboratory narrative indicate deficiencies?			×	
	Note Deficiencies:				
Chain	of-Custody (COC)	YES	NO	NA	COMMENTS
<b>Chain</b> a)		YES	<b>NO</b>	NA	COMMENTS
	Was the COC properly completed? Was the COC signed by both field	×			
a) b)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel?	×			COMMENTS
a)	Was the COC properly completed? Was the COC signed by both field	×			
a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel?	×			
a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	× × ×			
a) b) c) Genera	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition?	× × YES	□ □ NO		COMMENTS
a) b) c) Genera a)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? al (reference QAPP or Method) Were hold times met for sample pretreatment?	× × YES	□ □ <b>NO</b>		COMMENTS
a) b) c) Genera a) b)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis?	× × ¥ YES ×	□ □ ■ ■ ■		COMMENTS
a) b) c) <b>Gener</b> a a) b) c)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used?	× × YES × ×	□ □ <b>NO</b>		COMMENTS
a) b) c) <b>Gener</b> a) b) c) d)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used? Was the correct method used?	× × YES × ×	□ □ ■ ■ □		COMMENTS
a) b) c) <b>Genera</b> a) b) c) d) e)	Was the COC properly completed? Was the COC signed by both field and laboratory personnel? Were samples received in good condition? al (reference QAPP or Method) Were hold times met for sample pretreatment? Were hold times met for sample analysis? Were the correct preservatives used? Was the correct method used? Were appropriate reporting limits achieved?	× × YES × × ×	□ □ □ □ □ □ □		COMMENTS

#### 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)?			×	
Labora	tory 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?	×			
c)	Was the LCS accuracy criteria met?	×			
Duplica	ates	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	plicate	sample na	ames)?	DUP-1 @ S-UG1A
		×			FB-1 @ S-UG-2
b)	Were field dup. precision criteria met (note RPD)?	x			See Notes
c)	Were lab duplicates analyzed (note original and dup	olicate s	samples)?		
			×		
d)	Were lab dup. precision criteria met (note RPD)?			×	
Blind S	itandards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,		×		
	analytes included and concentrations)?				
b)	Was the %D within control limits?			x	
Matrix	Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a)	Was MS accuracy criteria met?	x			
	Recovery could not be calculated since sample contained high concentration of analyte?			x	
b)	Was MSD accuracy criteria met?	×			
	Recovery could not be calculated since sample contained high concentration of analyte?			×	
c)	Were MS/MSD precision criteria met?	x			

#### Comments/Notes:

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Max Field Duplicate RPD: 1.2% (Limit: 20%)	
Dilution: Chloride diluted in some samples; no qualification is necessary.	

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

#### Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				
$\searrow$				
			$\mathbf{X}$	
				/
		·		
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	1			
Signature:	my Abod f			Date: 11/12/2019
/	// /			



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

December 09, 2019

Jeffrey Ingram Golder Associates 13515 Barrett Parkway Drive Suite 260 Ballwin, MO 63021

RE: Project: AMEREN SIOUX ENERGY CTR SCPC Pace Project No.: 60321518

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on November 16, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Jami Church

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

Enclosures

cc: Ryan Feldmann, Golder Tommy Goodwin, Golder Associates Mark Haddock, Golder Associates Eric Schneider, Golder Associates





#### CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

#### **Pace Analytical Services Kansas**

9608 Loiret Boulevard, Lenexa, KS 66219 Missouri Inorganic Drinking Water Certification #: 10090 Arkansas Drinking Water Arkansas Certification #: 19-016-0 Arkansas Drinking Water Illinois Certification #: 004455 Iowa Certification #: 118 Kansas/NELAP Certification #: E-10116 Louisiana Certification #: 03055 Nevada Certification #: KS000212020-2 Oklahoma Certification #: 9205/9935 Florida: Cert E871149 SEKS WET Texas Certification #: T104704407-19-12 Utah Certification #: KS000212018-8 Illinois Certification #: 004592 Kansas Field Laboratory Accreditation: # E-92587 Missouri SEKS Micro Certification: 10070



#### SAMPLE SUMMARY

#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60321518001	S-UG-1A	Water	11/14/19 09:20	11/16/19 02:35
60321518002	S-UG-2	Water	11/14/19 16:03	11/16/19 02:35
60321518003	S-DG-1	Water	11/14/19 10:36	11/16/19 02:35
60321518004	S-DG-2	Water	11/14/19 12:15	11/16/19 02:35
60321518005	S-DG-3	Water	11/14/19 14:13	11/16/19 02:35
60321518006	S-DG-4	Water	11/15/19 09:50	11/16/19 02:35
60321518007	S-SCPC-DUP-1	Water	11/14/19 09:50	11/16/19 02:35
60321518008	S-SCPC-FB-1	Water	11/14/19 09:50	11/16/19 02:35
60321513010	S-BMW-1S	Water	11/15/19 14:43	11/16/19 02:35
60321513011	S-BMW-3S	Water	11/15/19 12:18	11/16/19 02:35



#### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60321518001	S-UG-1A	EPA 200.7	НКС	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321518002	S-UG-2	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321518003	S-DG-1	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321518004	S-DG-2	EPA 200.7	НКС	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	CNB, MJK	3	PASI-K
60321518005	S-DG-3	EPA 200.7	НКС	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60321518006	S-DG-4	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60321518007	S-SCPC-DUP-1	EPA 200.7	НКС	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60321518008	S-SCPC-FB-1	EPA 200.7	НКС	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 300.0	MGS	3	PASI-K
60321513010	S-BMW-1S	EPA 200.7	HKC	7	PASI-K
		SM 2320B	AJS2	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	CNB	3	PASI-K
60321513011	S-BMW-3S	EPA 200.7	НКС	7	PASI-K



Laboratory

PASI-K PASI-K

PASI-K

#### SAMPLE ANALYTE COUNT

Project: Pace Project	AMEREN SIOUX ENERGY CTR SCPC t No.: 60321518			
Lab ID	Sample ID	Method	Analysts	Analytes Reported
		SM 2320B	AJS2	1
		SM 2540C	BLA	1
		EPA 300.0	CNB	3



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Sample: S-UG-1A	Lab ID:	60321518001	Collected	d: 11/14/19	09:20	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	239	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:28	7440-42-8	
Calcium	166000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:28	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:28	7439-89-6	
Magnesium	39800	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:28	7439-95-4	
Manganese	465	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:28	7439-96-5	
Potassium	9530	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:28	7440-09-7	
Sodium	37900	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:28	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	430	mg/L	20.0	6.5	1		11/22/19 17:59		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	739	mg/L	10.0	10.0	1		11/21/19 16:04		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	118	mg/L	10.0	2.2	10		11/27/19 22:15	16887-00-6	
Fluoride	0.29	mg/L	0.20	0.085	1		11/27/19 21:59	16984-48-8	
Sulfate	53.0	mg/L	10.0	2.3	10		11/27/19 22:15	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 603

6032	1518			

Sample: S-UG-2	Lab ID:	60321518002	Collected	d: 11/14/19	16:03	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical I	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	144	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:30	7440-42-8	
Calcium	115000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:30	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:30	7439-89-6	
Magnesium	24100	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:30	7439-95-4	
Manganese	196	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:30	7439-96-5	
Potassium	5090	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:30	7440-09-7	
Sodium	32500	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:30	7440-23-5	
2320B Alkalinity	Analytical I	Method: SM 23	320B						
Alkalinity, Total as CaCO3	355	mg/L	20.0	6.5	1		11/22/19 18:05		
2540C Total Dissolved Solids	Analytical I	Method: SM 25	540C						
Total Dissolved Solids	480	mg/L	10.0	10.0	1		11/21/19 16:04		
300.0 IC Anions 28 Days	Analytical I	Method: EPA 3	00.0						
Chloride	27.8	mg/L	5.0	1.1	5		11/27/19 22:47	16887-00-6	
Fluoride	0.24	mg/L	0.20	0.085	1		11/27/19 22:31	16984-48-8	
Sulfate	43.8	mg/L	5.0	1.2	5		11/27/19 22:47	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 603

-			 	 	 
6	6032 <sup>,</sup>	1518			

Sample: S-DG-1	Lab ID:	60321518003	Collected:	11/14/19	9 10:36	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepar	ation Meth	od: EP	A 200.7			
Boron	111	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:33	7440-42-8	
Calcium	135000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:33	7440-70-2	
Iron	386	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:33	7439-89-6	
Magnesium	31200	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:33	7439-95-4	
Manganese	297	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:33	7439-96-5	
Potassium	4480	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:33	7440-09-7	
Sodium	4440	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:33	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	409	mg/L	20.0	6.5	1		11/22/19 18:11		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	524	mg/L	10.0	10.0	1		11/21/19 16:04		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	6.0	mg/L	1.0	0.22	1		11/27/19 23:03	16887-00-6	
Fluoride	0.33	mg/L	0.20	0.085	1		11/27/19 23:03	16984-48-8	
Sulfate	38.4	mg/L	5.0	1.2	5		11/27/19 23:19	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60

#### 60321518

Sample: S-DG-2	Lab ID:	60321518004	Collected	d: 11/14/19	12:15	Received: 11/	16/19 02:35 M	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP/	A 200.7			
Boron	100	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:35	7440-42-8	
Calcium	133000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:35	7440-70-2	
Iron	82.0	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:35	7439-89-6	
Magnesium	31300	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:35	7439-95-4	
Manganese	464	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:35	7439-96-5	
Potassium	5780	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:35	7440-09-7	
Sodium	4800	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:35	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	403	mg/L	20.0	6.5	1		11/22/19 18:17		
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Solids	512	mg/L	10.0	10.0	1		11/21/19 16:04		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	7.4	mg/L	1.0	0.22	1		11/27/19 23:35	16887-00-6	
Fluoride	0.39	mg/L	0.20	0.085	1		11/27/19 23:35	16984-48-8	
Sulfate	37.8	mg/L	5.0	1.2	5		12/03/19 13:38	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No .:

).:	60321518	

Lab ID:	60321518005	Collected	d: 11/14/19	9 14:13	Received: 11/	16/19 02:35 Ma	atrix: Water	
Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
93.1J	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:38	7440-42-8	
144000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:38	7440-70-2	
171	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:38	7439-89-6	
38100	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:38	7439-95-4	
700	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:38	7439-96-5	
6700	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:38	7440-09-7	
4780	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:38	7440-23-5	
Analytical	Method: SM 23	20B						
447	mg/L	20.0	6.5	1		11/22/19 18:24		
Analytical	Method: SM 25	40C						
576	mg/L	10.0	10.0	1		11/21/19 16:04		
Analytical	Method: EPA 3	00.0						
5.4	mg/L	1.0	0.22	1		12/02/19 11:10	16887-00-6	
0.42	-	0.20	0.085	1		12/02/19 11:10	16984-48-8	
51.1	-	5.0	1.2	5		12/02/19 11:59	14808-79-8	
	Results         Analytical         93.1J         144000         171         38100         700         6700         4780         Analytical         447         Analytical         576         Analytical         5.4         0.42	Analytical Method: EPA 2 93.1J ug/L 144000 ug/L 171 ug/L 38100 ug/L 700 ug/L 6700 ug/L 4780 ug/L Analytical Method: SM 23 447 mg/L Analytical Method: SM 25 576 mg/L Analytical Method: EPA 3 5.4 mg/L 0.42 mg/L	Results         Units         PQL           Analytical Method: EPA 200.7         Prepared           93.1J         ug/L         100           144000         ug/L         200           171         ug/L         50.0           38100         ug/L         50.0           700         ug/L         500           4780         ug/L         500           Analytical Method: SM 2320B         447           447         mg/L         20.0           Analytical Method: SM 2540C         576           576         mg/L         10.0           Analytical Method: EPA 300.0         5.4         mg/L         1.0           0.42         mg/L         0.20         1.0	Results         Units         PQL         MDL           Analytical Method: EPA 200.7         Preparation Method           93.1J         ug/L         100         10.7           144000         ug/L         200         50.0           171         ug/L         50.0         14.0           38100         ug/L         50.0         13.0           700         ug/L         5.0         2.1           6700         ug/L         500         79.0           4780         ug/L         500         144           Analytical Method: SM 2320B         447         mg/L         20.0         6.5           Analytical Method: SM 2540C         576         mg/L         10.0         10.0           Analytical Method: EPA 300.0         5.4         mg/L         1.0         0.22           0.42         mg/L         0.20         0.085         0.085         0.085	Results         Units         PQL         MDL         DF           Analytical Method: EPA 200.7         Preparation Method: EPA         100         10.7         1           144000         ug/L         200         50.0         1           171         ug/L         50.0         14.0         1           38100         ug/L         50.0         13.0         1           700         ug/L         50.0         13.0         1           6700         ug/L         500         79.0         1           4780         ug/L         500         14.4         1           Analytical Method: SM 2320B         447         mg/L         20.0         6.5         1           Analytical Method: SM 2540C         576         mg/L         10.0         10.0         1           Analytical Method: EPA 300.0         5.4         mg/L         1.0         0.22         1           0.42         mg/L         0.20         0.085         1	Results         Units         PQL         MDL         DF         Prepared           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         11/27/19 07:57         11/27/19 07:57           144000         ug/L         200         50.0         1         11/27/19 07:57           171         ug/L         50.0         14.0         1         11/27/19 07:57           38100         ug/L         50.0         13.0         1         11/27/19 07:57           700         ug/L         50.0         13.0         1         11/27/19 07:57           6700         ug/L         50.0         13.0         1         11/27/19 07:57           6700         ug/L         50.0         21.1         1         11/27/19 07:57           6700         ug/L         500         79.0         1         11/27/19 07:57           4780         ug/L         500         144         1         11/27/19 07:57           Analytical Method: SM 2320B         447         mg/L         20.0         6.5         1           Analytical Method: SM 2540C         576         mg/L         10.0         10.0         1           Analytical Method: EPA 300.0         1         0.22         1 <td>Results         Units         PQL         MDL         DF         Prepared         Analyzed           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         1         11/27/19 07:57         11/27/19 13:38           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38           171         ug/L         50.0         14.0         1         11/27/19 07:57         11/27/19 13:38           38100         ug/L         50.0         13.0         1         11/27/19 07:57         11/27/19 13:38           6700         ug/L         5.0         2.1         1         11/27/19 07:57         11/27/19 13:38           6700         ug/L         5.00         79.0         1         11/27/19 07:57         11/27/19 13:38           4780         ug/L         500         79.0         1         11/27/19 07:57         11/27/19 13:38           Analytical Method: SM 2320B         447         mg/L         20.0         6.5         1         11/22/19 18:24           Analytical Method: SM 2540C         576         mg/L         10.0         10.0         1         11/21/19 16:04           Analytical Method: EPA 300.0         5.4         mg/L         1.0</td> <td>Results         Units         PQL         MDL         DF         Prepared         Analyzed         CAS No.           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         1         11/27/19 07:57         11/27/19 13:38         7440-42-8           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38         7440-42-8           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38         7440-70-2           171         ug/L         50.0         14.0         1         11/27/19 07:57         11/27/19 13:38         7439-89-6           38100         ug/L         50.0         13.0         1         11/27/19 07:57         11/27/19 13:38         7439-95-4           700         ug/L         5.0         2.1         1         11/27/19 07:57         11/27/19 13:38         7439-96-5           6700         ug/L         500         79.0         1         11/27/19 07:57         11/27/19 13:38         7440-03-7           4780         ug/L         500         144         1         11/27/19 07:57         11/27/19 13:38         7440-23-5           Analytical Method: SM 2320B          1         <t< td=""></t<></td>	Results         Units         PQL         MDL         DF         Prepared         Analyzed           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         1         11/27/19 07:57         11/27/19 13:38           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38           171         ug/L         50.0         14.0         1         11/27/19 07:57         11/27/19 13:38           38100         ug/L         50.0         13.0         1         11/27/19 07:57         11/27/19 13:38           6700         ug/L         5.0         2.1         1         11/27/19 07:57         11/27/19 13:38           6700         ug/L         5.00         79.0         1         11/27/19 07:57         11/27/19 13:38           4780         ug/L         500         79.0         1         11/27/19 07:57         11/27/19 13:38           Analytical Method: SM 2320B         447         mg/L         20.0         6.5         1         11/22/19 18:24           Analytical Method: SM 2540C         576         mg/L         10.0         10.0         1         11/21/19 16:04           Analytical Method: EPA 300.0         5.4         mg/L         1.0	Results         Units         PQL         MDL         DF         Prepared         Analyzed         CAS No.           Analytical Method: EPA 200.7         Preparation Method: EPA 200.7         1         11/27/19 07:57         11/27/19 13:38         7440-42-8           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38         7440-42-8           144000         ug/L         200         50.0         1         11/27/19 07:57         11/27/19 13:38         7440-70-2           171         ug/L         50.0         14.0         1         11/27/19 07:57         11/27/19 13:38         7439-89-6           38100         ug/L         50.0         13.0         1         11/27/19 07:57         11/27/19 13:38         7439-95-4           700         ug/L         5.0         2.1         1         11/27/19 07:57         11/27/19 13:38         7439-96-5           6700         ug/L         500         79.0         1         11/27/19 07:57         11/27/19 13:38         7440-03-7           4780         ug/L         500         144         1         11/27/19 07:57         11/27/19 13:38         7440-23-5           Analytical Method: SM 2320B          1 <t< td=""></t<>



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.:

60321518

Sample: S-DG-4	Lab ID:	60321518006	Collected	: 11/15/19	09:50	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP/	A 200.7			
Boron	71.0J	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:40	7440-42-8	
Calcium	138000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:40	7440-70-2	
Iron	14.5J	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:40	7439-89-6	
Magnesium	38900	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:40	7439-95-4	
Manganese	138	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:40	7439-96-5	
Potassium	7580	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:40	7440-09-7	
Sodium	40300	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:40	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	381	mg/L	20.0	6.5	1		11/25/19 16:17		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	628	mg/L	10.0	10.0	1		11/22/19 11:15		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	96.9	mg/L	5.0	1.1	5		12/02/19 10:45	16887-00-6	M1
Fluoride	0.30	mg/L	0.20	0.085	1		12/02/19 09:58	16984-48-8	
Sulfate	33.9	mg/L	5.0	1.2	5		12/02/19 10:45	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Sample: S-SCPC-DUP-1	Lab ID:	60321518007	Collected:	11/14/19	09:50	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepar	ation Meth	od: EP/	A 200.7			
Boron	98.6J	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:53	7440-42-8	
Calcium	132000	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:53	7440-70-2	
Iron	76.8	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:53	7439-89-6	
Magnesium	30800	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:53	7439-95-4	
Manganese	460	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:53	7439-96-5	
Potassium	5720	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:53	7440-09-7	
Sodium	4670	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:53	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	409	mg/L	20.0	6.5	1		11/22/19 18:40		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	489	mg/L	10.0	10.0	1		11/21/19 16:05		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	7.6	mg/L	1.0	0.22	1		12/02/19 12:16	16887-00-6	
Fluoride	0.42	mg/L	0.20	0.085	1		12/02/19 12:16	16984-48-8	
Sulfate	36.6	mg/L	5.0	1.2	5		12/02/19 12:33	14808-79-8	



12/02/19 12:50 14808-79-8

#### ANALYTICAL RESULTS

#### Project: AMEREN SIOUX ENERGY CTR SCPC

<0.23

mg/L

Pace Project No.: 60321518

Sulfate

Sample: S-SCPC-FB-1	Lab ID:	60321518008	Collecte	d: 11/14/19	09:50	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	aration Meth	od: EP	A 200.7			
Boron	<10.7	ug/L	100	10.7	1	11/27/19 07:57	11/27/19 13:55	7440-42-8	
Calcium	<50.0	ug/L	200	50.0	1	11/27/19 07:57	11/27/19 13:55	7440-70-2	
Iron	<14.0	ug/L	50.0	14.0	1	11/27/19 07:57	11/27/19 13:55	7439-89-6	
Magnesium	<13.0	ug/L	50.0	13.0	1	11/27/19 07:57	11/27/19 13:55	7439-95-4	
Manganese	<2.1	ug/L	5.0	2.1	1	11/27/19 07:57	11/27/19 13:55	7439-96-5	
Potassium	<79.0	ug/L	500	79.0	1	11/27/19 07:57	11/27/19 13:55	7440-09-7	
Sodium	<144	ug/L	500	144	1	11/27/19 07:57	11/27/19 13:55	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	320B						
Alkalinity, Total as CaCO3	<6.5	mg/L	20.0	6.5	1		11/22/19 18:44		
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Solids	5.0	mg/L	5.0	5.0	1		11/21/19 16:05		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	0.45J	mg/L	1.0	0.22	1		12/02/19 12:50	16887-00-6	
Fluoride	<0.085	mg/L	0.20	0.085	1		12/02/19 12:50	16984-48-8	

1.0

0.23 1



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Sample: S-BMW-1S	Lab ID:	60321513010	Collected	d: 11/15/19	9 14:43	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	118	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:13	7440-42-8	
Calcium	143000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:13	7440-70-2	M1
Iron	<14.0	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:13	7439-89-6	
Magnesium	29700	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:13	7439-95-4	
Manganese	426	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:13	7439-96-5	
Potassium	424J	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:13	7440-09-7	
Sodium	5360	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:13	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	20B						
Alkalinity, Total as CaCO3	428	mg/L	20.0	6.5	1		11/25/19 15:41		
2540C Total Dissolved Solids	Analytical	Method: SM 25	40C						
Total Dissolved Solids	551	mg/L	10.0	10.0	1		11/22/19 08:54		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	6.4	mg/L	1.0	0.22	1		11/27/19 19:32	16887-00-6	
Fluoride	0.28	mg/L	0.20	0.085	1		11/27/19 19:32	16984-48-8	
Sulfate	26.5	mg/L	2.0	0.46	2		11/30/19 01:38	14808-79-8	



#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Sample: S-BMW-3S	Lab ID:	60321513011	Collected	d: 11/15/19	12:18	Received: 11/	16/19 02:35 Ma	atrix: Water	
Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical	Method: EPA 2	00.7 Prepa	ration Meth	od: EP	A 200.7			
Boron	80.1J	ug/L	100	10.7	1	11/26/19 09:12	11/26/19 18:17	7440-42-8	
Calcium	102000	ug/L	200	50.0	1	11/26/19 09:12	11/26/19 18:17	7440-70-2	
Iron	6800	ug/L	50.0	14.0	1	11/26/19 09:12	11/26/19 18:17	7439-89-6	
Magnesium	25600	ug/L	50.0	13.0	1	11/26/19 09:12	11/26/19 18:17	7439-95-4	
Manganese	519	ug/L	5.0	2.1	1	11/26/19 09:12	11/26/19 18:17	7439-96-5	
Potassium	3840	ug/L	500	79.0	1	11/26/19 09:12	11/26/19 18:17	7440-09-7	
Sodium	6610	ug/L	500	144	1	11/26/19 09:12	11/26/19 18:17	7440-23-5	
2320B Alkalinity	Analytical	Method: SM 23	320B						
Alkalinity, Total as CaCO3	342	mg/L	20.0	6.5	1		11/25/19 15:52		
2540C Total Dissolved Solids	Analytical	Method: SM 25	540C						
Total Dissolved Solids	418	mg/L	5.0	5.0	1		11/22/19 08:54		
300.0 IC Anions 28 Days	Analytical	Method: EPA 3	00.0						
Chloride	7.6	mg/L	1.0	0.22	1		11/27/19 21:07	16887-00-6	
Fluoride	0.23	mg/L	0.20	0.085	1		11/27/19 21:07	16984-48-8	
Sulfate	34.4	mg/L	2.0	0.46	2		11/27/19 21:23	14808-79-8	



Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

## QC Batch:624736Analysis Method:EPA 200.7QC Batch Method:EPA 200.7Analysis Description:200.7 Metals, Total

Associated Lab Samples: 60321513010, 60321513011

#### METHOD BLANK: 2547231

Associated Lab Samples:	60321513010, 60321513011	

		Blank	Reporting			
Parameter	Units	Result	Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<10.7	100	10.7	11/26/19 17:42	
Calcium	ug/L	<50.0	200	50.0	11/26/19 17:42	
Iron	ug/L	21.5J	50.0	14.0	11/26/19 17:42	
Magnesium	ug/L	<13.0	50.0	13.0	11/26/19 17:42	
Manganese	ug/L	<2.1	5.0	2.1	11/26/19 17:42	
Potassium	ug/L	<79.0	500	79.0	11/26/19 17:42	
Sodium	ug/L	<144	500	144	11/26/19 17:42	

Matrix: Water

#### LABORATORY CONTROL SAMPLE: 2547232

Descenter	11-24-	Spike	LCS	LCS	% Rec	0
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	1000	1030	103	85-115	
Calcium	ug/L	10000	9320	93	85-115	
Iron	ug/L	10000	9140	91	85-115	
Magnesium	ug/L	10000	9890	99	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Potassium	ug/L	10000	9900	99	85-115	
Sodium	ug/L	10000	9950	100	85-115	

MATRIX SPIKE & MATRIX	SPIKE DUPLI	CATE: 2547	233 MS	MSD	2547234							
Parameter	Units	60321513002 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	11200	1000	1000	12600	12700	132	144	70-130	1	20	M1
Calcium	ug/L	170000	10000	10000	182000	184000	127	140	70-130	1	20	M1
Iron	ug/L	69.8	10000	10000	9170	9330	91	93	70-130	2	20	
Magnesium	ug/L	29800	10000	10000	40000	40200	102	104	70-130	0	20	
Manganese	ug/L	404	1000	1000	1410	1430	101	102	70-130	1	20	
Potassium	ug/L	7710	10000	10000	17900	18000	102	103	70-130	1	20	
Sodium	ug/L	67100	10000	10000	78300	78700	112	116	70-130	1	20	

MATRIX SPIKE SAMPLE:	2547235						
		60321513010	Spike	MS	MS	% Rec	0 117
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Boron	ug/L	118	1000	1140	102	70-130	
Calcium	ug/L	143000	10000	146000	26	70-130	M1
Iron	ug/L	<14.0	10000	8880	89	70-130	

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#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

MATRIX SPIKE SAMPLE:	2547235						
		60321513010	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Magnesium	ug/L	29700	10000	38000	83	70-130	
Manganese	ug/L	426	1000	1400	97	70-130	
Potassium	ug/L	424J	10000	10200	98	70-130	
Sodium	ug/L	5360	10000	14900	96	70-130	

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Project:	AMER	EN SIOUX E	NERGY CTR SO	CPC									
Pace Project No.:	60321	518											
QC Batch:	6250	127		Analy	ysis Metho	d: F	EPA 200.7						
QC Batch Method:		200.7		-	ysis Descri		200.7 Metals	Total					
			01, 6032151800			•			518006 60 <sup>.</sup>	221512007	,		
Associated Lab Sar	npies:	603215180		2,0032131	0003, 003	21310004, 0	0032131600	5, 00321	516000, 60	321310007	,		
METHOD BLANK:	25483	62			Matrix: W	/ater							
Associated Lab Sar	nples:	603215180 603215180	01, 6032151800 08	2, 6032151	8003, 603	21518004, 6	6032151800	5, 60321	518006, 60	321518007	,		
				Blar	าk	Reporting							
Parar	neter		Units	Res	ult	Limit	MDL		Analyzed	Qı	alifiers		
Boron			ug/L		<10.7	100	)	10.7 1	1/27/19 13:	25			
Calcium			ug/L		<50.0	200	)		1/27/19 13:				
Iron			ug/L		<14.0	50.0	)	14.0 1	1/27/19 13:	25			
Magnesium			ug/L		<13.0	50.0	)	13.0 1	1/27/19 13:	25			
Manganese			ug/L		<2.1	5.0	)	<b>2.1</b> 1	1/27/19 13:	25			
Potassium			ug/L		<79.0	500	)	79.0 1	1/27/19 13:	25			
Sodium			ug/L		<144	500	)	144 1	1/27/19 13:	25			
LABORATORY CO	-	SAMPLE:	2548363	Spike	LC		LCS	% F					
Parar	neter		Units	Conc.	Res	sult	% Rec	Lin	nits (	Qualifiers	_		
Boron			ug/L	100	00	1020	102		85-115				
Calcium			ug/L	1000	)0	10200	102		85-115				
Iron			ug/L	1000	-	9980	100		85-115				
Magnesium			ug/L	1000		10000	100		85-115				
Manganese			ug/L	100	0	1020	102		85-115				
Potassium													
			ug/L	1000		10000	100		85-115				
Sodium			ug/L ug/L	1000 1000									
MATRIX SPIKE & N	IATRIX	SPIKE DUPI	ug/L	1000		10000	100		85-115				
	IATRIX	SPIKE DUPI	ug/L	1000		10000 10100	100		85-115				
	IATRIX	SPIKE DUPI	ug/L	1000	00	10000 10100	100		85-115	% Rec		Мах	
		SPIKE DUPI	ug/L LICATE: 2548	1000 364 MS	MSD	10000 10100 2548365	100 101		85-115 85-115	% Rec Limits	RPD	Max RPD	Qual
MATRIX SPIKE & N Paramete			ug/L LICATE: 2548 60321518006	1000 364 MS Spike	00 MSD Spike	10000 10100 2548365 MS	100 101 MSD	MS	85-115 85-115 MSD % Rec	Limits	RPD 2	RPD	Qual
MATRIX SPIKE & N Paramete Boron		Units	ug/L LICATE: 2548 60321518006 Result	1000 364 MS Spike Conc.	MSD Spike Conc.	10000 10100 2548365 MS Result	100 101 MSD Result	MS % Rec	85-115 85-115 MSD % Rec 107	Limits 70-130		RPD 20	Qual
MATRIX SPIKE & N		Units	ug/L LICATE: 2548 60321518006 Result 71.0J	1000 364 MS Spike Conc. 1000	MSD Spike Conc. 1000	10000 10100 2548365 MS Result 1120	100 101 MSD Result 1140	MS % Rec 104	85-115 85-115 MSD % Rec 107 5 112	Limits 70-130 70-130	2 2 2	RPD 20 20 20	Qual
MATRIX SPIKE & M Paramete Boron Calcium Iron		Units ug/L ug/L	ug/L LICATE: 2548 60321518006 Result 71.0J 138000 14.5J 38900	1000 364 MS Spike Conc. 1000 10000 10000 10000	MSD Spike Conc. 1000 10000 10000 10000	10000 10100 2548365 MS Result 1120 146000 9800 48800	100 101 MSD Result 1140 150000 9990 49600	MS % Rec 104 76 98 99	85-115 85-115 MSD % Rec 5 107 5 112 5 100 0 107	Limits 70-130 70-130 70-130 70-130	2 2 2 2 2	RPD 20 20 20 20 20	Qual
MATRIX SPIKE & M Paramete Boron Calcium Iron Magnesium Maganese		Units ug/L ug/L ug/L ug/L ug/L	ug/L LICATE: 2548 60321518006 Result 71.0J 138000 14.5J 38900 138	1000 364 MS Spike Conc. 1000 10000 10000 10000 10000	MSD Spike Conc. 1000 10000 10000 10000 10000	10000 10100 2548365 MS Result 1120 146000 9800 48800 1140	100 101 MSD Result 1140 150000 9990 49600 1160	MS % Rec 104 76 98 99 101	85-115 85-115 MSD % Rec 5 107 5 112 5 100 0 107 103	Limits 70-130 70-130 70-130 70-130 70-130	2 2 2 2 2 2	RPD 20 20 20 20 20 20	Qual
MATRIX SPIKE & M Paramete Boron Calcium		Units ug/L ug/L ug/L ug/L	ug/L LICATE: 2548 60321518006 Result 71.0J 138000 14.5J 38900	1000 364 MS Spike Conc. 1000 10000 10000 10000	MSD Spike Conc. 1000 10000 10000 10000	10000 10100 2548365 MS Result 1120 146000 9800 48800	100 101 MSD Result 1140 150000 9990 49600	MS % Rec 104 76 98 99	85-115 85-115 MSD % Rec 107 5 112 5 100 0 107 103 0 103	Limits 70-130 70-130 70-130 70-130 70-130 70-130	2 2 2 2 2	RPD 20 20 20 20 20 20 20 20	Qual

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- <b>,</b>	AMEREN S 60321518	IOUX ENERGY CTR SO	CPC					
QC Batch:	624293		Analysis Me	ethod:	SM 2320B			
QC Batch Method:	SM 2320B		Analysis De	escription:	2320B Alkalir	iity		
Associated Lab Sam	ples: 603	21518001, 6032151800	02, 60321518003,	60321518004,	6032151800	5, 60321518007	, 60321	518008
METHOD BLANK:	2545462		Matrix	: Water				
Associated Lab Sam	ples: 603	21518001, 6032151800	02, 60321518003,	60321518004,	6032151800	5, 60321518007	, 60321	518008
D	- 1	11-1-	Blank	Reporting	MD	A		0
Parame		Units	Result	Limit	MDL	Analy		Qualifiers
Alkalinity, Total as Ca	ICO3	mg/L	<6.5	5 20	0.0	6.5 11/22/19	) 16:12	
LABORATORY CON	TROL SAM	PLE: 2545463						
_			Spike	LCS	LCS	% Rec	_	
Parame	eter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers
Alkalinity, Total as Ca	ICO3	mg/L	500	510	102	90-110		
SAMPLE DUPLICATI	E: 254546	34						
			60321303002	Dup		Max		
Parame	eter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as Ca	ICO3	mg/L	1500	15 <sup>-</sup>	10	0	10	
SAMPLE DUPLICATI	E: 254546	6						
-			60321516004	Dup		Max		
Parame	eter	Units	Result	Result	RPD	RPD		Qualifiers
Alkalinity, Total as Ca	003	mg/L	360	3:	55	1	10	

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Project: AMEREN SIOUX	ENERGY CTR S	CPC						
Pace Project No.: 60321518 QC Batch: 624580		Analysis Me	ethod:	SM 2320B				
QC Batch Method: SM 2320B		Analysis De		2320B Alkalin	ity			
Associated Lab Samples: 60321513	010, 6032151301	-	·					
METHOD BLANK: 2546893		Matrix	: Water					
Associated Lab Samples: 60321513	010, 6032151301	1, 60321518006						
		Blank	Reporting					
Parameter	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<6.5	20	0	6.5	11/25/19 1	15:29	
LABORATORY CONTROL SAMPLE:	2546894							
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec		Rec nits	Qua	alifiers
Alkalinity, Total as CaCO3	mg/L	500	488	98		90-110		
SAMPLE DUPLICATE: 2546895								
		60321513010	Dup			Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers
Alkalinity, Total as CaCO3	mg/L	428	42	9	0		10	
SAMPLE DUPLICATE: 2546897								
		60321518006	Dup			Max		
Parameter	Units	Result	Result	RPD		RPD		Qualifiers

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Project: AMEREN SIOUX Pace Project No.: 60321518	ENERGY CTR S	CPC					
QC Batch: 624015		Analysis Me	ethod:	SM 2540C			
QC Batch Method: SM 2540C		Analysis De			issolved Solids		
	3001. 603215180	02, 60321518003,	•			603215	18008
					,		
METHOD BLANK: 2544577			: Water				
Associated Lab Samples: 60321518	3001, 603215180	02, 60321518003,			, 60321518007	603215	18008
Parameter	Units	Blank Result	Reporting Limit	MDL	Analy	zed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	)	5.0	5.0 11/21/19		
LABORATORY CONTROL SAMPLE:	2544578						
		Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Quali	fiers
Total Dissolved Solids	mg/L	1000	1010	101	80-120		
SAMPLE DUPLICATE: 2544579							
		60321516004	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
Total Dissolved Solids	mg/L	721	7	24	0	10	
SAMPLE DUPLICATE: 2544580							
SAIVIFLE DUPLICATE. 2044580		60321518004	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD		Qualifiers
			5				

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Project: AMEREN SIOUX Pace Project No.: 60321518	ENERGY CTR SC	PC					
QC Batch: 624081		Analysis Me	ethod:	SM 2540C			
QC Batch Method: SM 2540C		Analysis De	escription:	2540C Total D	Dissolved Solids	5	
Associated Lab Samples: 60321513	010, 60321513011	I					
METHOD BLANK: 2544812		Matrix	: Water				
Associated Lab Samples: 60321513	010, 60321513011	I					
		Blank	Reporting				
Parameter	Units	Result	Limit	MDL	Analy	/zed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.	0	5.0 11/22/19	9 08:51	
LABORATORY CONTROL SAMPLE:	2544813						
		Spike	LCS	LCS	% Rec		
Parameter	Units	Conc.	Result	% Rec	Limits	Qua	alifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	)	
SAMPLE DUPLICATE: 2544814							
		60321433002	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD	)	Qualifiers
Total Dissolved Solids	mg/L	2440	247	0	1	10	
SAMPLE DUPLICATE: 2544815							
		60321513002	Dup		Max		
Parameter	Units	Result	Result	RPD	RPD	)	Qualifiers
Total Dissolved Solids	mg/L	927	95	a	3	10	

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Project:	AMEREN SIOUX	ENERGY CTR S	CPC						
Pace Project No.:	60321518								
QC Batch:	624082		Analysis M	lethod:	SM 2540C				
QC Batch Method:	SM 2540C		Analysis D	escription:	2540C Tota	Dissolv	ed Solids		
Associated Lab Sar	mples: 60321518	8006							
METHOD BLANK:	2544816		Matri	x: Water					
Associated Lab Sar	mples: 6032151	8006							
_			Blank	Reporting					
Parar	neter	Units	Result	Limit	MD		Analyz	ed	Qualifiers
Total Dissolved Soli	ids	mg/L	<5.	0	5.0	5.0	11/22/19	11:13	
LABORATORY CO	NTROL SAMPLE:	2544817							
			Spike	LCS	LCS	%	Rec		
Parar	neter	Units	Conc.	Result	% Rec	Li	mits	Qua	alifiers
Total Dissolved Soli	ids	mg/L	1000	964	9	6	80-120		
SAMPLE DUPLICA	TE: 2544818								
			60321513012	2 Dup			Max		
Parar	neter	Units	Result	Result		)	RPD		Qualifiers
Total Dissolved Soli	ids	mg/L	77	9 8	854	9		10	
SAMPLE DUPLICA	.TE: 2544819								
			60321518006	5 Dup			Max		
Parar	meter	Units	Result	Result	RPE	)	RPD		Qualifiers
Total Dissolved Soli	ids	mg/L	62	8 6	643	2		10	

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QC Batch: 625047		Analysis M	ethod:	EPA 300.	.0			
QC Batch Method: EPA 300.0		Analysis D	escription:	300.0 IC	Anions			
Associated Lab Samples: 60321	513010, 60321513011							
METHOD BLANK: 2548479		Matri	x: Water					
Associated Lab Samples: 60321	513010, 60321513011							
		Blank	Reportir					
Parameter	Units	Result	Limit	N	/IDL	Analyz	ed	Qualifiers
Chloride	mg/L	<0.22		1.0	0.22	11/27/19		
Fluoride	mg/L	<0.08		0.20	0.085	11/27/19		
Sulfate	mg/L	<0.23	3	1.0	0.23	11/27/19	10:18	
METHOD BLANK: 2550027		Matri	x: Water					
Associated Lab Samples: 60321	513010, 60321513011							
		Blank	Reportir	ng				
Parameter	Units	Result	Limit		/IDL	Analyz	ed	Qualifiers
Chloride	mg/L	<0.22	2	1.0	0.22	11/29/19	20:37	
Fluoride	mg/L	<0.08		0.20	0.085	11/29/19		
Sulfate	mg/L	<0.23	3	1.0	0.23	11/29/19	20:37	
METHOD BLANK: 2550207		Matri	x: Water					
Associated Lab Samples: 60321	513010, 60321513011	<b>.</b>						
Parameter	Units	Blank	Reportir Limit		/IDL	Apolyz	ad	Qualifiers
		Result				Analyz		Quaimers
Chloride	mg/L	<0.22		1.0	0.22	12/02/19		
Fluoride	mg/L	<0.08		0.20	0.085	12/02/19		
Sulfate	mg/L	<0.23	3	1.0	0.23	12/02/19	09:31	
LABORATORY CONTROL SAMPLI	E: 2548480							
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec		6 Rec ₋imits	Qualifie	re
				/01100			Quante	
Chloride	mg/L	5	4.8		96 90	90-110 90-110		
Fluoride Sulfate	mg/L mg/L	2.5 5	2.5 4.5		99 90	90-110 90-110		
Suilate	ing/∟	5	4.5		90	90-110		
LABORATORY CONTROL SAMPLI	E: 2550028	0 11	1.00	1.00		( D		
Parameter	Units	Spike Conc.	LCS Result	LCS % Rec		6 Rec ₋imits	Qualifie	re
				/0 Kec			Qualifie	
Chloride	mg/L	5	4.8		96 05	90-110		
Fluoride	mg/L mg/L	2.5 5	2.4 4.9		95 99	90-110 90-110		
Sulfate					uu	GU_111		

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#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

LABORATORY CONTROL SAMPLE:	2550208					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SP	IKE DUPL	CATE: 2548	481		2548482							
			MS	MSD								
		60321513002	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	102	100	100	218	210	116	108	80-120	4	15	
Fluoride	mg/L	0.31	2.5	2.5	3.1	3.1	110	112	80-120	1	15	
Sulfate	mg/L	317	250	250	568	565	100	99	80-120	0	15	

MATRIX SPIKE SAMPLE:	2548483						
		60321513010	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	6.4	5	11.6	103	80-120	
Fluoride	mg/L	0.28	2.5	3.0	110	80-120	
Sulfate	mg/L	26.5	10	37.2	107	80-120	

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



QC Batch: 625048		Analysis M	ethod:	EPA 300.0				
QC Batch Method: EPA 300.0		Analysis De		300.0 IC Anio	ons			
	8001, 6032151800	,				21518007,	6032151	8008
METHOD BLANK: 2548493		Matrix	x: Water					
Associated Lab Samples: 6032151	8001, 6032151800	2, 60321518003,	6032151800	4,6032151800	5, 6032	21518007.	6032151	8008
		Blank	Reportin					
Parameter	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Chloride	mg/L	<0.22	2	1.0	0.22	11/27/19 ·	10:45	
Fluoride	mg/L	<0.085			).085	11/27/19		
Sulfate	mg/L	<0.23	3	1.0	0.23	11/27/19 <sup>-</sup>	10:45	
		N.4 - 1*						
METHOD BLANK: 2550023			x: Water					
Associated Lab Samples: 6032151	8001, 6032151800				5, 6032	21518007,	6032151	8008
5		Blank	Reporting	-		<b>.</b> .		0
Parameter	Units	Result	Limit	MDL		Analyz	ed	Qualifiers
Chloride	mg/L	<0.22	2	1.0	0.22	12/02/19	09:31	
Fluoride	mg/L	<0.085	5 (	).20 (	).085	12/02/19	09:31	
Sulfate	mg/L	<0.23	3	1.0	0.23	12/02/19	09:31	
				-				
METHOD BLANK: 2551117		Matri	x: Water					
METHOD BLANK: 2551117	8001, 6032151800	Matri: 02, 60321518003,	x: Water 6032151800	4, 6032151800	5, 6032	21518007,		8008
METHOD BLANK: 2551117 Associated Lab Samples: 6032151	8001, 6032151800	Matri: 2, 60321518003, Blank	x: Water 6032151800 Reportin	4, 6032151800 g			6032151	
METHOD BLANK: 2551117		Matri: 02, 60321518003,	x: Water 6032151800	4, 6032151800		21518007, Analyz	6032151	8008 Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride	8001, 6032151800	Matri; )2, 60321518003, Blank 	x: Water 6032151800 Reportin Limit	4, 6032151800 g 1.0	0.22	Analyz 12/03/19	6032151 ed 09:27	
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride	8001, 6032151800 Units mg/L 	Matri; )2, 60321518003, Blank Result <0.22 <0.085	x: Water 6032151800 Reportin Limit 2 5 (	4, 6032151800 g 1.0	0.22	Analyz 12/03/19 ( 12/03/19 (	6032151 ed 09:27 09:27	
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride	8001, 6032151800 Units mg/L	Matri; )2, 60321518003, Blank 	x: Water 6032151800 Reportin Limit 2 5 (	4, 6032151800 g 1.0	0.22	Analyz 12/03/19	6032151 ed 09:27 09:27	
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride	8001, 6032151800 Units mg/L mg/L mg/L	Matri; )2, 60321518003, Blank Result <0.22 <0.085	x: Water 6032151800 Reportin Limit 2 5 (	4, 6032151800 g 1.0 0.20 (	0.22	Analyz 12/03/19 ( 12/03/19 (	6032151 ed 09:27 09:27	
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate	8001, 6032151800 Units mg/L mg/L mg/L	Matri; )2, 60321518003, Blank Result <0.22 <0.085	x: Water 6032151800 Reportin Limit 2 5 (	4, 6032151800 g MDL 1.0 0.20 (0 1.0 LCS	0.22 0.085 0.23	Analyz 12/03/19 ( 12/03/19 (	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate	8001, 6032151800 Units mg/L mg/L mg/L	Matriz 02, 60321518003, Blank Result <0.22 <0.085 <0.23	x: Water 6032151800 Reporting Limit 5 (0 3	4, 6032151800 9 1.0 0.20 ( 1.0	0.22 0.085 0.23	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 (	6032151 ed 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter	8001, 6032151800 Units mg/L mg/L mg/L 2548494	Matri; )2, 60321518003, Blank Result <0.22 <0.085 <0.23 Spike	x: Water 6032151800 Reporting Limit 5 (0 3 LCS	4, 6032151800 g MDL 1.0 0.20 (0 1.0 LCS	0.22 0.085 0.23 % L	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 (	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units	Matri: 02, 60321518003, Blank Result <0.22 <0.085 <0.23 Spike Conc.	x: Water 6032151800 Reporting Limit 5 (0 3 LCS Result	4, 6032151800 g MDL 1.0 0.20 (0 1.0 LCS % Rec	0.22 0.085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units mg/L	Matri: 02, 60321518003, Blank Result <0.22 <0.088 <0.23 <0.23 <0.23	x: Water 6032151800 Reportin Limit 5 (0 3 LCS Result 4.7	4, 6032151800 g MDL 1.0 0.20 (0 1.0 LCS % Rec 94	0.22 0.085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits 90-110	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units mg/L mg/L	Matri: 02, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.25	x: Water 6032151800 Reportin Limit 5 (0 3 LCS Result 4.7 2.7	4, 6032151800 g MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108	0.22 0.085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 6 Rec imits 90-110 90-110	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride Sulfate	8001, 6032151800 	Matri: 12, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.23 <0.25 <0.25 5 2.5 5	x: Water 6032151800 Reporting Limit 25 6 3 LCS Result 4.7 2.7 4.7	4, 6032151800 9 MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108 94	0.22 ).085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits 90-110 90-110 90-110	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter Chloride Fluoride Sulfate	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units mg/L mg/L mg/L mg/L mg/L	Matriz 12, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.23 <0.25 5 2.5 5 Spike Spike Spike	x: Water 6032151800 Reporting Limit 2 5 6 6 7 7 7 8 7 8 8 8 8 8 8 8 9 7 7 4.7 1 2.7 4.7	4, 6032151800 9 MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108 94 108	0.22 ).085 0.23 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits 90-110 90-110 90-110	6032151 ed 09:27 09:27 09:27 Qualif	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE:	8001, 6032151800 	Matri: 12, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.23 <0.25 <0.25 5 2.5 5	x: Water 6032151800 Reporting Limit 25 6 3 LCS Result 4.7 2.7 4.7	4, 6032151800 9 MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108 94	0.22 ).085 0.23 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits 90-110 90-110 90-110	6032151 ed 09:27 09:27 09:27	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter LABORATORY CONTROL SAMPLE: Parameter Chloride	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Matri: 12, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.23 <0.23 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0	x: Water 6032151800 Reporting Limit 2 5 6 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	4, 6032151800 9 MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108 94 LCS % Rec 99	0.22 0.085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 5 Rec imits 90-110 90-110 90-110 5 Rec imits 90-110	6032151 ed 09:27 09:27 09:27 Qualif	Qualifiers
METHOD BLANK: 2551117 Associated Lab Samples: 6032151 Parameter Chloride Fluoride Sulfate LABORATORY CONTROL SAMPLE: Parameter LABORATORY CONTROL SAMPLE: Parameter	8001, 6032151800 Units mg/L mg/L mg/L 2548494 Units mg/L mg/L mg/L mg/L mg/L mg/L mg/L	Matri: 12, 60321518003, Blank Result <0.22 <0.085 <0.23 <0.23 <0.23 <0.23 <0.23 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.25 <0.2	x: Water 6032151800 Reporting Limit 2 5 6 6 7 7 7 7 7 7 7 7 4.7 4.7 2.7 4.7	4, 6032151800 9 MDL 1.0 0.20 (0 1.0 LCS % Rec 94 108 94 LCS % Rec	0.22 0.085 0.23 % 	Analyz 12/03/19 ( 12/03/19 ( 12/03/19 ( 12/03/19 ( 6 Rec imits 90-110 90-110 90-110 90-110	6032151 ed 09:27 09:27 09:27 Qualif	Qualifiers

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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#### Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

LABORATORY CONTROL SAMPLE:	2551118					
		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SP	IKE DUPL	ICATE: 2548		2548496								
			MS	MSD								
		60321515006	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	12.5	5	5	17.9	17.8	108	107	80-120	0	15	
Fluoride	mg/L	0.45	2.5	2.5	3.1	3.1	105	104	80-120	0	15	
Sulfate	mg/L	71.8	25	25	102	102	123	119	80-120	1	15	E,M1

MATRIX SPIKE & MATRIX SP	PIKE DUPLI	CATE: 2548	497		2548498							
			MS	MSD								
	6	60321516004	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	83.5	25	25	113	112	117	116	80-120	0	15	E
Fluoride	mg/L	0.33	2.5	2.5	3.0	2.9	105	104	80-120	1	15	
Sulfate	mg/L	185	100	100	229	251	44	65	80-120	9	15	M1

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



QC Batch: 62	5468		Analy	sis Metho	od: I	PA 300.0						
QC Batch Method: EF	PA 300.0		Analy	sis Descr	iption:	800.0 IC Ar	ions					
Associated Lab Samples	: 603215180	006										
METHOD BLANK: 2550	0404			Matrix: V	Vater							
Associated Lab Samples	: 603215180	006										
Devenenter		l la ita	Blan		Reporting			A se e la se e el	0			
Parameter	· .	Units	Resu		Limit	MD		Analyzed		alifiers		
Chloride		mg/L		<0.22	1.		0.22	12/02/19 09				
Fluoride		mg/L	<	:0.085	0.2		0.085	12/02/19 09				
Sulfate		mg/L		<0.23	1.	)	0.23	12/02/19 09	:11			
METHOD BLANK: 255	1173			Matrix: V	Vater							
Associated Lab Samples	: 603215180	006										
			Blan	k	Reporting							
Parameter		Units	Resu	ılt	Limit	MD	L	Analyzed	Qu	alifiers		
Chloride		mg/L		<0.22	1.	)	0.22	12/03/19 11:	31			
Fluoride		mg/L	<	:0.085	0.2	)	0.085	12/03/19 11:	31			
Sulfate		ma/l		~ ~~	1.0	ר	0.23	12/03/19 11:	31			
		mg/L		<0.23	1.1	,	0.20	12/03/19 11.	01			
	DL SAMPLE:	2550405		<0.23		, 	0.20	12/03/19 11.				
	DL SAMPLE:		Spike			LCS		Rec				
	DL SAMPLE:			L			%	Rec	Qualifiers			
LABORATORY CONTRC Parameter	DL SAMPLE:	2550405	Spike Conc.	L	cs	LCS	% Li	Rec				
LABORATORY CONTRC Parameter Chloride	DL SAMPLE:	2550405 Units	Spike Conc.	L( 	CS sult	LCS % Rec	% Li 5	Rec imits		_		
LABORATORY CONTRO Parameter Chloride Fluoride	DL SAMPLE:	2550405 Units mg/L	Spike Conc.	L( 	CS sult 4.8	LCS % Rec 9	% Li 5 4	Rec imits 90-110		_		
ABORATORY CONTRO Parameter Chloride Fluoride Sulfate		2550405 Units mg/L mg/L	Spike Conc.	L( 	CS sult 4.8 2.3	LCS % Rec 9 9	% Li 5 4	Rec imits 90-110 90-110		_		
ABORATORY CONTRO Parameter Chloride Fluoride Sulfate		2550405 Units mg/L mg/L mg/L	Spike Conc.	L( Re 5 5 5	CS sult 4.8 2.3	LCS % Rec 9 9	% Li 5 4 8	Rec imits 90-110 90-110		_		
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate		2550405 Units mg/L mg/L mg/L	Spike Conc. 2.5	Re 5 5 5 	CS sult 4.8 2.3 4.9	LCS % Rec 9 9 9	%  5 4 8 %	Rec imits 90-110 90-110 90-110 90-110		_		
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter		2550405 Units mg/L mg/L mg/L 2551174	Spike Conc. 2.3 Spike Conc.	Re 5 5 5 	CS sult 4.8 2.3 4.9 CS	LCS % Rec 9 9 9 9	% 5 4 8 % Li	Rec imits 90-110 90-110 90-110 90-110	Qualifiers	_		
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter Chloride		2550405 Units mg/L mg/L mg/L 2551174 Units	Spike Conc. 2.3 Spike Conc.	L0 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult	LCS % Rec 9 9 9 9 9 9 9 8 8 9 8 9	%  5 4 8  6	Rec joo-110 90-110 90-110 90-110 Rec imits	Qualifiers			
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride		2550405 Units mg/L mg/L 2551174 Units mg/L	Spike Conc.	L0 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult 4.8	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9	%  5 4 8  6 3	Rec 90-110 90-110 90-110 90-110 Rec imits 90-110	Qualifiers	_		
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride Sulfate	DL SAMPLE:	2550405 Units mg/L mg/L 2551174 2551174 Units mg/L mg/L mg/L	Spike Conc.	L0 5 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3 4.9	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9 9	%  5 4 8  6 3	Rec 90-110 90-110 90-110 90-110 Rec imits 90-110 90-110	Qualifiers			
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride Sulfate	DL SAMPLE:	2550405 Units mg/L mg/L 2551174 2551174 Units mg/L mg/L mg/L	Spike Conc.	L0 5 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9 9	%  5 4 8  6 3	Rec 90-110 90-110 90-110 90-110 Rec imits 90-110 90-110	Qualifiers			
ABORATORY CONTRO Parameter Chloride Fluoride Sulfate ABORATORY CONTRO Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRI	DL SAMPLE:	2550405 Units mg/L mg/L 2551174 2551174 Units mg/L mg/L mg/L mg/L clCATE: 2550 60321518006	Spike Conc. 2.5 Spike Conc. 2.5 406 MS Spike	L( 5 5 5 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3 4.9	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9 9	 5 4 8  6 3 8  Li 6 3 8  KS	Rec imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers % Rec	_	Max	
LABORATORY CONTRO Parameter Chloride Fluoride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride Sulfate	DL SAMPLE:	2550405 Units mg/L mg/L 25551174 25551174 Units mg/L mg/L mg/L mg/L	Spike Conc. 2.8 Spike Conc. 2.9 406 MS	L0 Re 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3 4.9 2550407	LCS 9 9 9 9 9 9 9 9 9 9 9 9 9 9	 5 4 8  6 3 8	Rec imits 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers	RPD		Qua
LABORATORY CONTRO Parameter Chloride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRI Parameter	DL SAMPLE:	2550405 Units mg/L mg/L 2551174 2551174 Units mg/L mg/L mg/L mg/L clCATE: 2550 60321518006	Spike Conc. 2.5 Spike Conc. 2.5 406 MS Spike	LC Re 55 55 55 55 55 55 55 55 55 55 55 55 55	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3 4.9 2550407 MS Result 124	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9 9	 5 4 8  6 3 8  Li 6 3 8  KS	Rec 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers % Rec Limits		RPD	Qua 
LABORATORY CONTRO Parameter Chloride Sulfate LABORATORY CONTRO Parameter Chloride Fluoride Sulfate MATRIX SPIKE & MATRI	DL SAMPLE:	2550405 Units mg/L mg/L 2551174 Units mg/L mg/L mg/L LICATE: 2550 60321518006 Result	Spike Conc. 2.3 Spike Conc. 406 MS Spike Conc.	LC Re 55 55 55 55 55 55 55 55 55 55 55 55 55	CS sult 4.8 2.3 4.9 CS sult 4.8 2.3 4.9 2550407 MS Result 124 2.7	LCS % Rec 9 9 9 9 9 9 9 9 9 9 9 9 9 9	K 5 4 8 —K 6 3 8 —K 6 3 8 —K 6 3 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 4 8 —K 10 5 5 4 8 —K 10 5 5 5 4 5 5 4 8 8 —K 10 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Rec 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110 90-110	Qualifiers Qualifiers		RPD 15 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**

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

MATRIX SPIKE & MATRIX S		CATE: 2550	408		2550409							
			MS	MSD								
	6	0321509010	Spike	Spike	MS	MSD	MS	MSD	% Rec		Max	
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	2.7	5	5	7.4	7.5	93	95	80-120	1	15	
Fluoride	mg/L	2.0	2.5	2.5	4.4	4.5	95	98	80-120	1	15	
Sulfate	mg/L	556	250	250	800	803	97	99	80-120	0	15	

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



#### QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

#### 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.

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

TNI - The NELAC Institute.

#### LABORATORIES

PASI-K Pace Analytical Services - Kansas City

#### ANALYTE QUALIFIERS

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

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



#### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR SCPC

Pace Project No.: 60321518

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60321513010	S-BMW-1S	EPA 200.7	624736	EPA 200.7	624858
60321513011	S-BMW-3S	EPA 200.7	624736	EPA 200.7	624858
60321518001	S-UG-1A	EPA 200.7	625027	EPA 200.7	625177
60321518002	S-UG-2	EPA 200.7	625027	EPA 200.7	625177
60321518003	S-DG-1	EPA 200.7	625027	EPA 200.7	625177
60321518004	S-DG-2	EPA 200.7	625027	EPA 200.7	625177
60321518005	S-DG-3	EPA 200.7	625027	EPA 200.7	625177
60321518006	S-DG-4	EPA 200.7	625027	EPA 200.7	625177
60321518007	S-SCPC-DUP-1	EPA 200.7	625027	EPA 200.7	625177
60321518008	S-SCPC-FB-1	EPA 200.7	625027	EPA 200.7	625177
60321513010	S-BMW-1S	SM 2320B	624580		
60321513011	S-BMW-3S	SM 2320B	624580		
60321518001	S-UG-1A	SM 2320B	624293		
60321518002	S-UG-2	SM 2320B	624293		
60321518003	S-DG-1	SM 2320B	624293		
60321518004	S-DG-2	SM 2320B	624293		
60321518005	S-DG-3	SM 2320B	624293		
60321518006	S-DG-4	SM 2320B	624580		
60321518007	S-SCPC-DUP-1	SM 2320B	624293		
60321518008	S-SCPC-FB-1	SM 2320B	624293		
60321513010	S-BMW-1S	SM 2540C	624081		
60321513011	S-BMW-3S	SM 2540C	624081		
60321518001	S-UG-1A	SM 2540C	624015		
60321518002	S-UG-2	SM 2540C	624015		
60321518003	S-DG-1	SM 2540C	624015		
60321518004	S-DG-2	SM 2540C	624015		
60321518005	S-DG-3	SM 2540C	624015		
60321518006	S-DG-4	SM 2540C	624082		
60321518007	S-SCPC-DUP-1	SM 2540C	624015		
60321518008	S-SCPC-FB-1	SM 2540C	624015		
60321513010	S-BMW-1S	EPA 300.0	625047		
60321513011	S-BMW-3S	EPA 300.0	625047		
60321518001	S-UG-1A	EPA 300.0	625048		
60321518002	S-UG-2	EPA 300.0	625048		
60321518003	S-DG-1	EPA 300.0	625048		
60321518004	S-DG-2	EPA 300.0	625048		
60321518005	S-DG-3	EPA 300.0	625048		
60321518006	S-DG-4	EPA 300.0	625468		
60321518007	S-SCPC-DUP-1	EPA 300.0	625048		
60321518008	S-SCPC-FB-1	EPA 300.0	625048		

		WO#:60321518
Pace Analytical Sample Condition	Upon Receipt	60321518
Client Name: Golder		
Courier: FedEx 🗆 UPS 🗅 VIA 🗆 Clay 🗆		Pace 🗆 Xroads 🖉 Client 🗆 Other 🗆
Tracking #: Pa	ace Shipping Label Used	? Yes □ No Z
Custody Seal on Cooler/Box Present: Yes 🖉 No 🗆		No 🗆
Packing Material:     Bubble Wrap □     Bubble Bags       Thermometer Used:     ✓     Z49     Type	☐ Foam □ of Ice: Wet Blue Non	
Cooler Temperature (°C): As-readC Corr. Fac	ctor_ <u></u> Correcte	ed <u>Z, 0</u> Date and initials of person examining contents: <u>11/67/19</u>
Temperature should be above freezing to 6°C		
Chain of Custody present:	Ves 🗆 No 🗆 N/A	
Chain of Custody relinquished:	Tres INO IN/A	
Samples arrived within holding time:	Ves DNO DN/A	
Short Hold Time analyses (<72hr):	TYes No DN/A	
Rush Turn Around Time requested:		
Sufficient volume:	Yes No N/A	
Correct containers used:	Ves DNO DN/A	
Pace containers used:		
Containers intact:		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?		
Filtered volume received for dissolved tests?	DYes DNO DNA	
Sample labels match COC: Date / time / ID / analyses		
Samples contain multiple phases? Matrix:	□Yes DNo □N/A	
Containers requiring pH preservation in compliance? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:		ist sample IDs, volumes, lot #'s of preservative and the date/time added.
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 ØN/A	
Samples from USDA Regulated Area: State:	TYes DNO DN/A	
Additional labels attached to 5035A / TX1005 vials in the field	1? 🛛 Yes 🖾 No 🖓 N/A	
Client Notification/ Resolution: Copy COC	to Client? Y T N	Field Data Required? Y / N
Person Contacted: Date/ Comments/ Resolution:	Time:	
Project Manager Review		11/20/19
Project Manager Review:	_ Date:	

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F-KS-C-003-Rev.11, February 28, 2018

C	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.

Sectic Requin	Section A Required Client Information:	Section B Required Project Information:	t Informa	ation:				Sec	Section C	Section C Invoice Information:								<u> </u>	Page:	~	đ	
Company:	ny: Golder Associates	Report To: Jeffrey Ingram	rey Ing	Jram				Atte	Attention:							r		1				
Address:	s: 13515 Barrett Parkway Dr., Ste 260	Copy To:						Con	Company Name:	ame:						REGULA	REGULATORY AGENCY	SENCY			-	
	Ballwin, MO 63021							Add	Address:							L NPDES	ES	GROUND WATER	WATER	L.,	DRINKING WATER	WATER
Email To:	o: jeffrey ingram@golder.com	Purchase Order No.	No					Pace Refe	Pace Quote Reference:							I UST	L	RCRA		L	OTHER	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Amer	Ameren Sioux Energy Center	Energy	Center S	SCPC	Pace	Pace Project Manager:		Jamie Church	trch				Site Location	ation					
Reque	Requested Due Date/TAT: Standard	Project Number.						Pace	Profile #	ŕ 9285	2		×			S7	STATE:	Q I				
														Req	ueste	Requested Analysis Filtered (Y/N)	Filtered (	(N/A				
	Section D Valid Matrix Codes Required Client Information <u>MATRIX</u> <u>COL</u>		(AM		COLL	COLLECTED				Pres	Preservatives	es.	<b>†</b> N /A	z z	z							
		은 의 가입니 Codes to	00=0 8AA9	COMPOSITE	STTE -	COMPOSITE END/GRAB	SITE						i yeni ka 🕇	etetlu2/e					(N/A)			
# W311	(A-Z, 0-9 /, -) Sample IDS MUST BE UNIQUE		I (G=2) 39YT 319MAS	DATE	U U U U U U U U U U U U U U U U U U U	DATE	I IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	AMPLE TEMP AT CONTAINERS	Unpreserved	<sup>€</sup> ONH <sup>5</sup> OS <sup>z</sup> H	NªOH HCI	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol	Other Analysis Test	Metals* Chloride/Fluoride	SQT	۸lkalinity			Residual Chlorine	Lo 32	Lo321518	っろこバジタ Pace Project No./ Lab I.D.
-	S-UG-1A	ΨΤ	U			4-41-11	0	3	=	E	F			3	Z				L			a
2	S-UG-2	WT	_			-	11.03	2		1				5	12	_						an
e	S-DG-1	WT	U				10.36	3	-	1				5	+ 4							03
4	S-DG-2	WT	U				5121	2	-	1			11	2	1	2			_			22
ŝ	S-DG-3	WT	U	_		-+	1413	3	-	-				3	2	>						al.
9	S-DG-4	WT	U	-		11-5-11	0450	CP CP	-				-	2	2							20
7	S-SCPC-DUP-1	ΜT	IJ			H-4-11	_	c,	-	-			-	2	7	2						8
~	S-SCPC-FB-1	WT	U			-	0950	9	-					7	7	~						8
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*EPA	EPA 2007: B, Ca, Fe, Mn, Mg, K, Na	Amir	Mul	Viulitarth	11	POLIC	11-15-	-19 15	S	$^{2}$	M	Ka	R	NMANNO	anu		2	545				
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						PRINT Nan	Name of SAMPLER:	ER	nni	J	Nuch	Sar.	5						, uị du	bevie: N\Y) e	ody Se	ni seiq
						SIGNATUF	SIGNATURE of SAMPLER:		amin	1	MUM	Harry	h	DATE (MM/	DATE Signed (MM/DD/YY):	1-16	61-1		neT			
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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.

F-ALL-Q-020rev.08, 12-Oct-2007

$\sim$		WO#:60321513
Pace Analytical Sample Condition	Jpon Receipt	60321513
Client Name: Goold G		
		Pace 🗆 Xroads 🗹 Client 🗆 Other 🗆
Tracking #: Pa	ce Shipping Label Use	d? Yes 🗆 No 🗖
Custody Seal on Cooler/Box Present: Yes 🖉 No 🗆	Seals intact: Yes	
Packing Material: Bubble Wrap D Bubble Bags	Foam 🗌	None 🗆 Other 🗆
Thermometer Used: 7-299 Type o	of Ice: Wet Blue No	
Cooler Temperature (°C): As-read <u>2, 6, 7</u> Corr. Fac	tor <u>2</u> Correc	ted 3.0, 25 Date and initials of person examining contents: 71 114177
Temperature should be above freezing to 6°C	1	1
Chain of Custody present:	Tres DNo DN/A	
Chain of Custody relinquished:		
Samples arrived within holding time:	/ Pres INO IN/A	
Short Hold Time analyses (<72hr):	TYes TNO TN/A	
Rush Turn Around Time requested:		
Sufficient volume:		
Correct containers used:		
Pace containers used:		
Containers intact:		
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?		
Filtered volume received for dissolved tests?	Yes No ZN/A	
Sample labels match COC: Date / time / ID / analyses		
Samples contain multiple phases? Matrix:		
Containers requiring pH preservation in compliance? (HNO₃, H₂SO₄, HCI<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Cyanide water sample checks:	Yes No N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Lead acetate strip turns dark? (Record only)	□Yes □No	
Potassium iodide test strip turns blue/purple? (Preserve)	□Yes □No	
Trip Blank present:		
Headspace in VOA vials ( >6mm):		8
Samples from USDA Regulated Area: State:	DYes DNO ZIN/A	
Additional labels attached to 5035A / TX1005 vials in the field	/	
Client Notification/ Resolution: Copy COC t	o Client? Y 1 N	Field Data Required? Y / N
Person Contacted: Date/	Гіте:	
Comments/ Resolution:		

Project Manager Review:

Janui Church

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\_ 11/20/19 Date

F-KS-C-003-Rev.11, February 28, 2018

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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	Section A Required Client Information:	Section B Required Project Information:	t Infon	mation:					Sect Invoid	Section C Invoice Information:	mation:										Page:	~	2	3	
Company:	y: Golder Associates	Report To: Jeffrey Ingram	rey Ir	ngram					Attention:	tion:										S: 1					
Address:	: 13515 Barrett Parkway Dr., Ste 260	Copy To:							Com	Company Name:	ame:						æ	EGULA	REGULATORY AGENCY	SENCY				118	
	Ballwin, MO 63021								Address:	ess:								- NPDES	2	GROUNI	GROUND WATER	L.,	DRINKI	DRINKING WATER	~
Email To:	i jeffrey ingram@golder.com	Purchase Order No :	No.:						Pace Quoti Reference:	Pace Quote Reference:							_	UST	l	RCRA		L	OTHER		
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ă	eren Siol	Ameren Sioux Energy Center St	Center	SCPB		Pace	Pace Project Manager	1	Jamie Church	urch				-	Site Location	tion	2	7777				
sequest	Requested Due Date/TAT: Standard	Project Number.							Pace	Pace Profile #:	<b>⊭</b> : 9285	35					Γ	ST	STATE: -	₽					
															R	senbe	sted A	alysis I	Requested Analysis Filtered (Y/N)	(NI)					
	Section D Valid Matrix Codes Required Client Information MATRIX COL	Щ	(dM		COLL	COLLECTED					Pre	Preservatives	ves	∎N /A	Z	z z	z								
	DRINKING WATER WASTE WASTE WASTE PRODUCT SOILSOUD	a sepos pilev e 정도 첫 ~ 명 오	OD=D BAR	COM	COMPOSITE START	END	COMPOSITE	DILECTION								eteilu2\e					(N/Y) (				
# W3	Sample ID (A-Z, 0-9 / -) Sample IDS MUST BE UNIQUE	2 	иМРLЕ ТҮРЕ (G≂(					AMPLE TEMP AT CC		ubreserved	NO <sup>3</sup> SO⁵	ISI ICI	lazS <sub>z</sub> O <sub>3</sub> lethanol	ther Test zisylsnA	etals*	DS hloride/Fluoride	lkalinity Balinity				sesidual Chlorine	leas	40321513	0321513	5
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-	S-TMM-3S	TW	-				1/B		n	•	-				2	7	2							0	202
4	S-LMW-4S	ΨΤ	U	/			120	2	0	-	-				2	2	2			7					R
5	S-LMW-5S	ΨŢ	U				1050	2	2	-	-				2	5	2			-	_				Se .
9	S-LMW-6S	WT	U				145		3	-	-				7	7	5			1	-			V	B
7	S-TMM-7S	ΨΤ	U L		_		123		a	-	-				7	7,	2			-	-				
80	S-LMW-8S	M	U		~		133	-	3	-					2	7	2								8
თ	S-LMW-9S	WT	U		_	414	-	0-1	a	-				1	5	23				+	-				622
10	S-BMW-1S	M	U L		-		21445	20	70	-		-	_	T	•		2								S S
11	S-BMW-3S	WT	ڻ ۲		1	Į.	1917	~	10			-		T				-		+	-				ò
12	S-LMW-DUP-1	ŢŴ	о Б		-	-	١	-	d l		-	_	_	-	2				-					NTIONS	ar
	ADDITIONAL COMMENTS	REI	ILING	UISHED B	E	NOL		DATE		TIME	-		ACCE	ACCEPTED BY / AFFILIATION	SY / AF	FILIAL	N	DAIE							
•EPA 2	•EPA 200 7: B, Ca, Fe, Mn, Mg, K, Na	Annie Muchilarth	N	Whiter Whiter	-	UTIAN	T	1	9 15	1540)	9	myela	ela	3	NUMBI	3		1.11	115-1015	5.45			Ì		
		angela	- <b>- P</b>	MUMAAA	MAN			1-1210		1545		'd'			A			enter	Cre 4/1	In	300	X	$\lambda$	$\mathbf{X}$	
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"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.

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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.

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Company: Golder Associates	Repo	Report To: Jeffrey Ingram	Attention:			
Address: 13515 Barrett Parkway Dr., Ste 260	r., Ste 260 Copy To:	γ.To:	Company Name:	REGULATO	REGULATORY AGENCY	
Ballwin, MO 63021			Address:	NPDES	CEROUND WATER	DRINKING WATER
Email To: jeffrey ingram@golder.com		Purchase Order No :	Pace Quote Reference:	UST	RCRA	OTHER
Phone: 636-724-9191 Fax: 636-724-9323		Project Name: Ameren Sioux Energy Center SCPB	Pace Project Jamie Church Manager:	Site Location	on NO	
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## **MEMORANDUM**

Project No. 153140601

DATE January 10, 2020

- TO Project File Golder Associates
- **CC** Amanda Derhake, Jeff Ingram
- **FROM** Tommy Goodwin

EMAIL Tommy\_Goodwin@golder.com

#### DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER - SCPC - DATA PACKAGE 60321518

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 MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When MS/MSD recovery exceeded the QC limits, the associated sample result was qualified as an estimate (J).

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Compa	ny Name: Golder Associates		Project Manager: J Ingram				
	Name: Ameren - Sioux - SCPC		Project Number: <u>153140601</u> Validation Date: <u>1/9/2020</u> SDG #: <u>60321518</u> SM 2540C (TDS); EPA 300.0 (Anions)				
Review	er: T Goodwin						
Analytic Matrix:		; SM 2540					
Sample	Names <u>S-UG-1A, S-UG-2, S-DG-1, S-DG-2, S-DG-3, S</u>	5-DG-4, S-S	SCPC-DUI	P-1, S-SCPC	C-FB-1, S-BMW-1S, S-BMW-3S		
NOTE:	Please provide calculation in Comment areas	or on the	back (if	on the bac	k please indicate in comment areas).		
Field Ir	nformation	YES	NO	NA	COMMENTS		
a)	Sampling dates noted?	×			11/14-15/2019		
b)	Sampling team indicated?	×					
c)	Sample location noted?	×					
d)	Sample depth indicated (Soils)?			×			
e)	Sample type indicated (grad)composite)?	×					
f)	Field QC noted?	×					
g)	Field parameters collected (note types)?	×			pH, Sp.Cond, ORP, Temp, DO, Turb		
h)	Field Calibration within control limits?	×					
i)	Notations of unacceptable field conditions/perform	mances fro	om field l	ogs or field	notes?		
			×				
j)	Does the laboratory narrative indicate deficiencie	s? 🗌		×			
	Note Deficiencies:						
Chain-	of-Custody (COC)	YES	NO	NA	COMMENTS		
a)	Was the COC properly completed?	×					
b)	Was the COC signed by both field and laboratory personnel?		×		Page 2 of COC not completed/signed by field staff		
c)	Were samples received in good condition?	×					
Genera	al (reference QAPP or Method)	YES	NO	NA	COMMENTS		
a)	Were hold times met for sample pretreatment?	×					
b)	Were hold times met for sample analysis?	x					
c)	Were the correct preservatives used?	x					
d)	Was the correct method used?	×					
e)	Were appropriate reporting limits achieved?	×					
f)	Were any sample dilutions noted?	×			See Notes		

×

g) Were any matrix problems noted?

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

Blank	5	YES	NO	NA	COMMENTS
a)	Were analytes detected in the method blank(s)?	×			See Notes
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)?			×	
Labor	atory 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?	x			
Duplic	ates	YES	NO	NA	COMMENTS
a)	Were field duplicates collected (note original and du	uplicate	sample n	ames)?	DUP-1 @ S-DG-2
		×			FB-1 @ S-UG-1A
b)	Were field dup. precision criteria met (note RPD)?	×			See Notes
c)	Were lab duplicates analyzed (note original and dup	plicate :	samples)?	?	
		x			-13010 (Alk); -18006 (Alk, TDS); -18004 (TDS)
d)	Were lab dup. precision criteria met (note RPD)?	x			See Notes
Blind	Standards	YES	NO	NA	COMMENTS
a)	Was a blind standard used (indicate name,		×		
	analytes included and concentrations)?				
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:

FB-1: TDS (5.0), CI (0.45)
MB: -13010-11: Fe (21.5)
MS/MSD: -18006: CI_MSD-H (123% of 80-120%); -13010: Ca_MS-L (26% of 70-130%)
Max Field Duplicate RPD: 7.4% (Limit 20%)
Max Lab Duplicated RPD: 6% (Limit 10%)
Dilution: Chloride and Sulfate diluted in several samples; no qualification is required.

#### **QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST**

#### **Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-DG-4	Chloride (CI)	96.9	J	MSD Exceeded QC Range
S-BMW-1S	Calcium (Ca)	149,000	J	MS Exceeded QC Range
		2		
	1 11	11	1	

Signature: \_\_\_\_\_\_\_ Jood/p \_\_\_\_\_ Date: \_\_\_\_\_\_Date: \_\_\_\_\_\_

Page 3 of 3

Revised May 2004

APPENDIX B

Alternative Source Demonstration-August 2019 Sampling Event



# **SCPC - Alternative Source Demonstration**

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

Submitted to:

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

Submitted by:

**Golder Associates Inc.** 13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

January 2020

# **Distribution List**

1 Electronic Copy - Ameren Missouri

1 Hard Copy - Golder

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- Figure 9: June 2006 Historical Piper Diagram
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# **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 Golder Associates Inc.

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).

#### **GOLDER ASSOCIATES INC.**



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

Principal, Practice Leader

# 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 a Statistically Significant Increase (SSI) calculated at Ameren Missouri's (Ameren) 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 westnorthwest 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. The property is bounded to the south by a railroad. The SEC is bounded to the east and west by agricultural fields.

# 3.1 Geological and Hydrogeological Setting

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 unconformable on top of bedrock. These alluvial deposits, which can range from approximately 100 to 130 feet thick, make up the uppermost aquifer called the alluvial aquifer. Overall, this aquifer is described as a fining upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Drilling in the alluvial aquifer identified different sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are 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 Cell 1 - 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 Coal Combustion Residuals (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<sub>3</sub>) mix is introduced into the boiler flue gas flow. The limestone reacts with the sulfur dioxide (SO<sub>2</sub>) in the flue gas and produces 'synthetic' gypsum (calcium



sulfate dihydrate (CaSO<sub>4</sub> \* 2H<sub>2</sub>O)). 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<sup>-7</sup> 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 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 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 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 and the SCPC 2017 Annual Report.

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 sampling 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. At the SCPC in November 2017, initial exceedances were identified in monitoring wells UG-2 for fluoride and DG-4 for boron. Verification sampling results confirmed a Statistically Significant Increase (SSI) for fluoride at UG-2. An ASD was prepared that demonstrated that this SSI was primarily caused by natural temporal and spatial variability in the aquifer, a relatively low calculated UPL when compared to historical data from this well, and low fluoride results that are near the laboratory practical quantitation limit (PQL). In May 2018, there were three (3) initial exceedances for boron at DG-1, DG-3, and DG-4 but none were confirmed by verification sampling. In November 2018, there were five initial exceedances for pH at DG-1, DG-2, and DG-3; boron at DG-1; and sulfate at DG-3. Similar to May 2018, none were confirmed by verification sampling.

For the August 2019 sampling event, there were four initial exceedances for calcium and chloride at UG-1A, for fluoride at UG-2 and for sulfate at DG-3. All except sulfate at DG-3 were confirmed by verification sampling. The SSIs from the August 2019 sampling event are displayed in **Table 1** below and are for calcium and chloride at UG-1A and fluoride at UG-2.

# 4.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

Analytical data from two monitoring wells confirmed SSIs during the August 2019 sampling event; UG-1A and UG-2. These wells are screened in the upper portion of the alluvial aquifer just below the average seasonal low for groundwater. As shown on **Figure 1**, UG-1A and UG-2 are located north or northwest of the SCPC and south of Highway 94, the generating plant, and the two surface impoundments near the plant (SCPA and SCPB).

Based on Golder's review of the pre-disposal data discussed in Section 3.2 above, and our comparison of those pre-disposal data with the results from the eight CCR-rule baseline events, it was concluded that the groundwater at the SCPC contained low-level pre-existing impacts from CCR that pre-dated SCPC operation. As a result of these pre-existing impacts, the SCPC statistical analysis plan uses intrawell UPLs to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

#### Table 1 - Review of Statistically Significant Increases

Constituent	Well ID	UPL Based on Baseline Events	August 2019 Updated UPL	Baseline Sampling Event Range	All CCR Sampling Events (through January 2019) Range	State UWL Program Sampling Events Range	August 2019 Results	October 2019 Results
Calcium (µg/L)	UG-1A	164,715	177,869	124,000 - 154,000	116,000 - 154,000	129,000 - 212,000	177,000	166,600
Chloride (mg/L)	UG-1A	131.6	145.9	25.4 - 99.8	25.4 - 99.8	15 - 159	145	140
Fluoride (mg/L)	UG-2	0.24	0.3308	0.17 - 0.24	ND - 0.28	0.16 - 0.34	0.25	0.30

Notes

- 1) mg/L milligrams per liter.
- 2) µg/L micrograms per liter.
- 3) UPL Upper Prediction Limit. UPL's calculated using Sanitas<sup>™</sup> software.
- 4) ND Non-detect.

# 5.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

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

- Documentation of pre-existing, low level concentrations of CCR indicators in groundwater that pre-date the SCPC operation.
- Comparison of key WFGD indicator parameter concentrations (sulfate, calcium, chloride, and boron) prior to and following receipt of CCR in the SCPC.
- Documentation of the construction of the SCPC with a 80-mil geomembrane liner and a 2-foot thick clay barrier.
- Preparation of geochemical models displaying current and historical groundwater chemistries.
- Road salt (sodium chloride) is commonly used for road de-icing purposes on Missouri State Highway 94, which is located within 300 feet of UG-1A.

# 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 2** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

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

Notes:

<sup>1)</sup> 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.

In 2011, the Electric Power Research Institute (EPRI) completed a study of FGD composition from many sites across the country and determined that greater than 90% of the material present in FGD deposits is calcium sulfate dihydrate (CaSO<sub>4</sub>\*2H<sub>2</sub>0). Therefore, impacts from WFGD deposits will likely contain high concentrations of sulfate and calcium compared to background and adjacent samples. Additionally, chloride, fluoride, boron, and sodium concentrations are also potential indicators of WFGD gypsum (EPRI 2012, EPRI 2017).

#### 5.1.1 Sulfate Concentrations at the SCPC

Sulfate is the key indicator of potential WFGD impacts because high concentrations of sulfate are found ubiquitously in WFGD materials with the exception of strongly reducing conditions, and sulfate is relatively mobile in most hydrogeological environments. The groundwater around the SCPC does not demonstrate strongly reducing conditions, such as dissolved oxygen values below 0.5 milligrams per liter (mg/L), negative oxidation reduction potential (ORP), dissolved iron concentrations above 1 mg/L, nor are hydrogen sulfide odors reported at the SCPC. Therefore, if the SSI was caused by impacts from the SCPC, it would be expected that high sulfate values would increase following placement of CCR materials.

**Figure 2** displays the full historical set of sulfate concentrations at UG-1A and UG-2 including the period prior to the receipt of CCR. If the SSI was caused by impacts from the SCPC, sulfate concentrations would be expected to increase following the placement of CCR materials. **Figure 2** demonstrates that current sulfate concentrations are at levels similar too or below those from pre-CCR placement.

### 5.1.2 Boron Concentrations

Based on the EPRI (2011, 2012, 2017) reports, elevated concentrations in boron may indicate WFGD impacts. Like chloride and sodium, boron is soluble and mobile, and thus a good tracer for CCR related impacts. However, any increased boron concentrations associated with a release from a WFGD type impoundment would be expected to also contain increasing sulfate and calcium concentrations, as discussed in previous sections. If groundwater was impacted by the SCPC, current boron concentrations should be statistically elevated with respect to pre-CCR placement.

**Figure 3** displays boron concentrations at UG-1A and UG-2 from prior to the receipt of CCR through the current CCR Rule sampling. This figure demonstrates that current boron concentrations are at similar levels to those from pre-CCR placement.

### 5.2 SSIs at UG-1A 5.2.1 Calcium Concentrations

Calcium is a key indicator in WFGD impoundments because there are high concentrations of calcium (calcium sulfate dihydrate) in WFGD type impoundments. Like sulfate, if the SSI was caused by impacts from the SCPC, calcium concentrations would be noticeably higher and at levels statistically higher than pre-CCR placement.

The initial intrawell UPL for calcium at UG-1A is 164,715 micrograms per liter ( $\mu$ g/L) and was calculated using the results of the eight initial CCR Rule baseline sampling events that ranged from 124,000 to 154,000  $\mu$ g/L. The UPLs were updated after the August 2019 sampling event as outlined by the Statistical Analysis Plan. The updated UPL value that will be used for UG-1A, starting with the November 2019 sampling event, is 177,869  $\mu$ g/L (**Figure 4**). During the August 2019 Detection Monitoring event, a value of 177,000  $\mu$ g/L was reported, which was confirmed by a value of 166,600  $\mu$ g/L during the verification sampling.

**Figure 4** shows a time series plot of calcium and compares data from historic State UWL sampling and CCR Rule sampling. Current calcium concentrations in monitoring well UG-1A are similar to or lower than those reported prior to the operation of the SCPC. If only the data collected in the state program prior to the receipt of CCR was used to calculate the prediction limit, the resulting limit would be 233,576  $\mu$ g/L, which is well above the August value of 177,000  $\mu$ g/L.

Based on these data, in addition to the observations reported above for sulfate and boron, the variability in calcium concentrations over time is not a result of WFGD influence on the groundwater. It is likely a result of geochemical variability and the limited sample set used for UPL calculation that does not reflect the whole variability of the aquifer.

#### 5.2.2 Chloride and Sodium Concentrations

Chloride and sodium can be present at elevated concentrations within the SCPC because the water used for transporting the slurry to the SCPC is in a closed loop, meaning water is being recycled and re-used, resulting in increased chloride and sodium concentrations. Chloride and sodium are also highly soluble, mobile, and conservative (i.e., don't interact with geologic materials) under most hydrogeological environments, and as such, are routinely used as indicator parameters of landfill leachate migration at municipal waste facilities throughout the United States. Therefore, if the SSI was caused by an impact from the SCPC, chloride and sodium concentrations would be expected to increase after the placement of CCR. Only chloride is required to be monitored as part of the CCR Rule.

The initial intrawell UPL for chloride at UG-1A is 131.6 mg/L and was calculated using the results of the eight initial CCR Rule baseline sampling events that ranged from 25.4 to 99.8 mg/L. UPLs were updated after the August 2019 sampling event as outlined by the Statistical Analysis Plan. The updated chloride UPL value that will be used for UG-1A, starting with the November 2019 sampling event, is 145.9 mg/L (**Figure 5**). During the August 2019 Detection Monitoring event, a value of 145 mg/L was reported, which was confirmed by a value of 140 mg/L during the verification sampling.

**Figure 5** shows a time series plot of chloride and compares data from historic State UWL sampling and CCR Rule sampling. Current chloride concentrations in monitoring well UG-1A are similar to or lower than those reported prior to the operation of the SCPC. If only the data collected in the state program prior to the receipt of CCR was used to calculate the prediction limit, the resulting limit would be 215.5 mg/L, which is well above the August value of 145 mg/L.

Based on these data, in addition to the observations reported above for sulfate and boron, the variability in chloride concentrations over time is not a result of WFGD influence on the groundwater. It is likely a result of geochemical variability and the limited sample set used for UPL calculation that does not reflect the whole variability of the aquifer.

Additionally, while WGFD CCR materials contain high concentrations of chloride, a common alternative source for chloride is road salt (sodium chloride). Road salt is commonly used for road de-icing purposes on Missouri State Highway 94, which is located within 300 feet of UG-1A. **Figure 6** is a multi-constituent time series plot displaying sodium and chloride concentrations. Results from this plot display a good correlation between sodium and chloride results. The seasonal variation in sodium and chloride results is likely caused by road salt application, which subsequently dissolves and infiltrates into the shallow alluvial aquifer.

# 5.3 SSI at UG-2

#### 5.3.1 Fluoride Concentrations

The intrawell UPL for fluoride at UG-2 is 0.24 mg/L, which is only slightly above the PQL of 0.20 mg/L provided by the laboratory. The UPL of 0.24 mg/L was based on the results of the eight CCR Rule baseline sampling events for UG-2 that ranged from 0.17 to 0.24 mg/L. The results from this small dataset could not be normalized, therefore, a non-parametric limit was used as the prediction limit (i.e., the highest of the baseline sampling results). UPLs were updated after the August 2019 sampling event as outlined by the Statistical Analysis Plan. Using the expanded dataset, the values could be normalized and the updated UPL value that will be used for UG-2, starting with the November 2019 sampling event, is 0.3308 mg/L. During the August 2019 Detection Monitoring event, a value of 0.25 mg/L was reported, which was confirmed by a value of 0.30 mg/L during subsequent verification sampling. These values do represent an SSI, but it is important to note they are very low (within 0.01 and 0.06 mg/L of the baseline UPL, respectively) and close to the PQL value the laboratory can accurately detect.

While sulfate and calcium are the two primary components of WFGD byproducts, fluoride (which triggered the SSI at UG-2) may also be an indicator of potential impacts from WFGD deposits. However, any increased fluoride concentrations associated with a release from a WFGD type impoundment would be expected to also contain increasing sulfate and calcium concentrations. So, while it is possible that the SSI reported for fluoride in monitoring well UG-2 is from a release of WFGD, the absence of increased concentrations for sulfate and calcium effectively eliminate WFGD as the source.

**Figure 7** shows a time series plot of fluoride and compares data from historic State UWL sampling and CCR Rule sampling. Current fluoride concentrations in monitoring well UG-2 are similar to those reported prior to the operation of the SCPC. In addition, fluoride concentrations have varied between 0.16 mg/L and 0.34 mg/L over the entire historical monitoring period. Based on these data, in addition to the observations reported above for sulfate and calcium, the variability in fluoride concentrations over time is not a result of WFGD influence on the groundwater, but is likely a result of geochemical variability or other sources not related to the SCPC.

As also shown on **Figure 7**, if only the fluoride results reported prior to placement of WFGD waste are used, the calculated UPL is 0.3371 mg/L, which is approximately 0.097 mg/L higher than the UPL calculated from the eight baseline samples collected for the CCR Rule and 0.037 mg/L higher than the result reported for the verification sampling event. From this, it is clear that the calculated prediction limit from the CCR Rule was biased low because the results reported during the initial eight (8) CCR Rule baseline sampling rounds were relatively low for fluoride in this well. If the historical data are used to supplement the results collected during the CCR Rule baseline period, no SSI would be triggered for fluoride in UG-2.

The pre-CCR based prediction limit of 0.3371 mg/L is also within the range of fluoride concentrations reported for upgradient background wells BMW-1S and BMW-3S, which are located approximately ½ mile to the northwest of the SEC. The calculated initial background limit for fluoride in background wells BMW-1S and BMW-3S is 0.38 mg/L. These similarities in concentrations between the upgradient background wells and the pre-CCR based prediction limit for the SCPC is an indication that the pre-CCR based prediction limit and the updated prediction limit for fluoride are more representative of true background limits for fluoride.

# 5.4 Geochemical Modeling

In June 2006, temporary groundwater piezometers that were installed as part of the Detailed Site Investigation (DSI) were sampled for major cation and anion concentrations. These data are available in Appendix 13 of the DSI and the piezometer locations are provided in **Figure 1**. Additionally, during the Detection Monitoring event in August 2019, major cation and anion concentrations were collected from the CCR Rule monitoring network for the

SCPC. These data were used to compare current major ion chemistry with the chemistry from 2006, four (4) years prior to placement of CCR in the UWL.

**Table 3** contains the values of the major cations and anions from both the recent and historical sampling events. These data were used in the generation of the Stiff and Piper diagrams discussed below. While most of the numbers are similar between the two datasets, chloride and sodium values are significantly higher for some of the wells located near roads. As discussed above, these changes in groundwater chemistry are likely caused by the use of road salt on Highway 94 and are not a result of the SCPC or any other source of CCR.

#### 5.4.1 Stiff Diagrams

Stiff diagrams visually display the major cation and anion data. **Figure 8**, displays the Stiff diagrams from the historical 2006 data, as well as the current SCPC and SCL4A CCR Rule monitoring data. Data from 2006 display a similar distribution to that of August 2019 data. The only major difference between the two sampling events is the increase in the sodium + potassium and chloride plots, causing a slightly different shape in monitoring wells UG-1A, UG-2, and UG-3 relative to piezometers PZ-4, PZ-21, and PZ-36. As discussed above, sodium and chloride concentrations are very seasonally dependent and are influenced by the use of road salt on the nearby Highway 94. Therefore, except for seasonal changes in chloride and sodium, overall groundwater chemistry at the UWL has remained similar since 2006, which is four (4) years prior to CCR placement in the SCPC.

#### 5.4.2 Piper Diagram

A Piper diagram is a graphical technique used to classify different groundwater chemistry. The same data used to generate the Stiff diagram are plotted on a ternary Piper diagram according to major cation and anion concentrations. In addition to showing instantaneous concentrations, Piper diagrams can be used to determine if groundwater chemistry is changing, either spatially or temporally. **Figures 9** and **10** are Piper diagrams displaying data from 2006 and August 2019, respectively.

As shown by the similar placement on the Piper diagrams, the data from 2006 (**Figure 9**) display a similar distribution to that of August 2019 (**Figure 10**). The only notable difference between the two sampling events is the placement of UG-1A, UG-2, and UG-3 relative to other wells. UG-1A, UG-2, and UG-3 plot slightly higher on the sodium + potassium and chloride axes, causing them to be slightly shifted. As discussed above, sodium and chloride concentrations are seasonally dependent and are influenced by the use of road salt on the nearby Highway 94. Except for seasonal differences in chloride and sodium, overall groundwater chemistry at the UWL has remained similar since 2006, which was four (4) years prior to CCR placement in the SCPC.

# 6.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY SCPC IMPACT

Based on the information presented in Section 5 above, the SSIs for calcium, chloride and fluoride were not caused by impacts from the SCPC. The SSIs appear to be caused by numerous factors, but are primarily caused by the following:

- Relatively low calculated initial UPLs for the CCR Rule monitoring data, when compared to historical data.
- Very low fluoride concentrations that are near the laboratory PQL threshold for the testing method accuracy.
- Spatial and temporal variability in the alluvial aquifer sampling results that are influenced by pre-existing lowlevel CCR impacts.
- The use of road salt (NaCL) on Highway 94. This causes an increase in chloride concentrations in monitoring wells located near the highway such as UG-1A and UG-2. Additionally, UG-1A and UG-2 are located south of Highway 94, which is typically the downgradient direction of groundwater flow in that area.

As required by the CCR Rule, eight (8) baseline samples were collected prior to the October 2017 deadline which were used to calculate the UPL for UG-2. According to the *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (USEPA 2009), eight (8) samples is the minimum number of samples recommended in order to complete statistical tests and future data will be used to enlarge the dataset for UPL calculation. At the SCPC, previous data from State UWL monitoring show pre-existing low-level CCR impacts and put the SSI in context relative to historical groundwater conditions at the site.

As shown in Section 5, each of the SSIs was below historical results at that well. The eight (8) background events, all collected in a relatively short timeframe in accordance with the CCR Rule, had statistically lower results than typically found prior to the receipt of WFGD in the SCPC. Therefore, the UPLs calculated from those data only represent the lower range of values in the overall population.

The comparison of key WFGD indicator parameters (sulfate, calcium, chloride, fluoride, and boron) between current groundwater conditions and those present prior to SCPC operations support the conclusion that the SCPC is not the source of the SSIs. The data and analyses presented herein demonstrate that no significant change in groundwater conditions has occurred from SCPC operations.

Other supplemental lines of evidence also demonstrate that there are no impacts on groundwater from the SCPC. Hydrogeological analysis of groundwater flow since 2008 indicates that groundwater at the SCPC typically flows to the south. Therefore, impacts from the SCPC would likely be observed in the downgradient (DG) wells to the south of the SCPC instead of to the north. Geochemical comparisons also display that there has been no significant change in groundwater quality between pre-CCR conditions (2006) and present-day sampling, except for seasonal changes in sodium and chloride concentrations caused by road salt usage on Highway 94. Further, the double-lined construction of the SCPC with 2-feet of compacted clay overlain by an 80-mil HDPE liner, also limits the likelihood that the SSI is a result of impact from SCPC.

In summary, there are no indications to support migration of CCR contaminants from the SCPC. Instead, the data indicate that the cause for the SSIs is due to alluvial aquifer variability, of pre-existing impacts, laboratory method accuracy, limited baseline data available for the calculation of the UPL, and the use of road salt on Highway 94.

# 7.0 REFERENCES

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## Tables

# Table 3Major Cation and Anion ConcentrationsSCPC - Alternative Source DemonstrationSioux Energy Center, St. Charles County, MO

Monitoring Well ID	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Calcium (mg/L)	Total Magnesium (mg/L)	Total Chloride (mg/L)	Total Sulfate (mg/L)	Total Alkalinity <sup>(2)</sup> (mg/L)	
<b>Detection Monito</b>	etection Monitoring - August 2019							
S-BMW-1S	5.35	0.383	149	28.4	8.8	34.1	432	
S-BMW-3S	5.28	0.648	122	22.4	10.6	25.3	358	
S-DG-1	4.23	4.01	135	32.3	6.2	41.7	411	
S-DG-2	4.76	5.14	133	33.3	8.2	37.1	425	
S-DG-3	4.68	6.47	148	39.1	4.8	49.5	450	
S-DG-4	44.6	7.57	136	39.5	103	31.5	403	
S-TMW-1	2.76	4.9	99.8	18.2	2.1	40.2	269 J	
S-TMW-2	3.18	5.15	123 J	23.1	3.3	52.1	361 J	
S-TMW-3	4.08	5.55	123	23.3	2.6	37.2	369 J	
S-UG-1A	39.1	9.53	177	42	145	57.7	437	
S-UG-2	30.4	4.7	116	24.6	30	45.2	362	
S-UG-3	24.2	5.75	159	32.3	85	144	337 J	
Historical Data - J	une 2006					-		
PZ-1	5.2	4.1	140	38	11	69	480	
PZ-2	3.8	2.8	120	32	36	6.6	420	
PZ-3	5.4	5.2	140	27	12	53	440	
PZ-4	16	4.5	140	35	13	220	320	
PZ-10	3.4	3.9	99	31	4.6	43	370	
PZ-21	8.0	2.9	130	26	25	100	350	
PZ-25	4.2	4.9	120	38	19	29	470	
PZ-36	7.2	4.2	110	22	21	34	310	
PZ-40	3.2	4.0	120	21	1.7	33	370	
PZ-50	3.4	3.8	97	24	18	43	290	
PZ-55	3.9	4.5	120	24	6.1	52	370	
PZ-56	4.4	4.5	110	22	25	49	340	
PZ-57	4.8	4.4	120	24	4.0	42	370	

Notes:

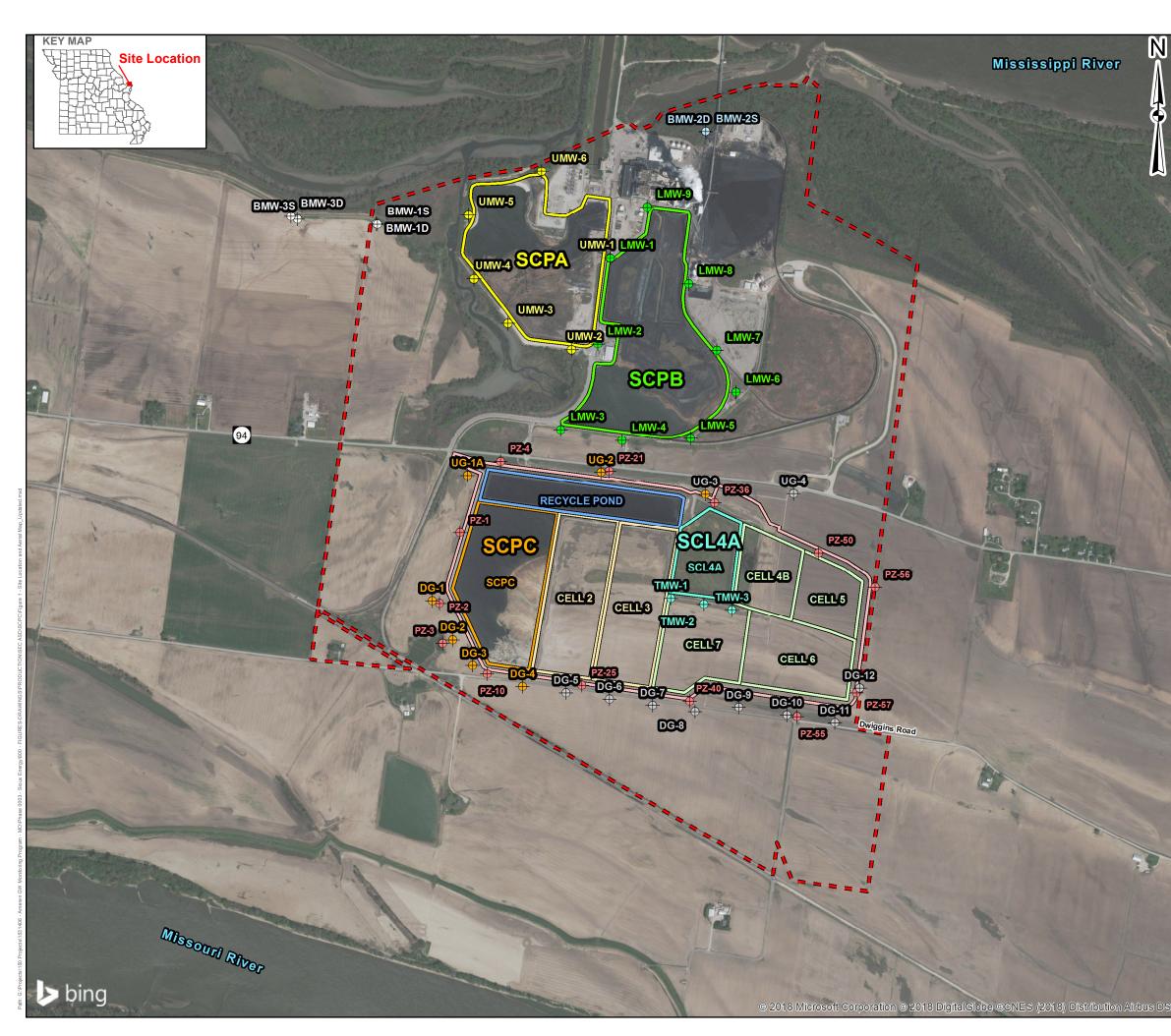
1) 2006 Historical Data from Appendix 13 of the Detailed Site Investigation (DSI).

2) Alkalinity is equal to Carbonate + Bicarbonate.

3) mg/L - milligrams per liter.

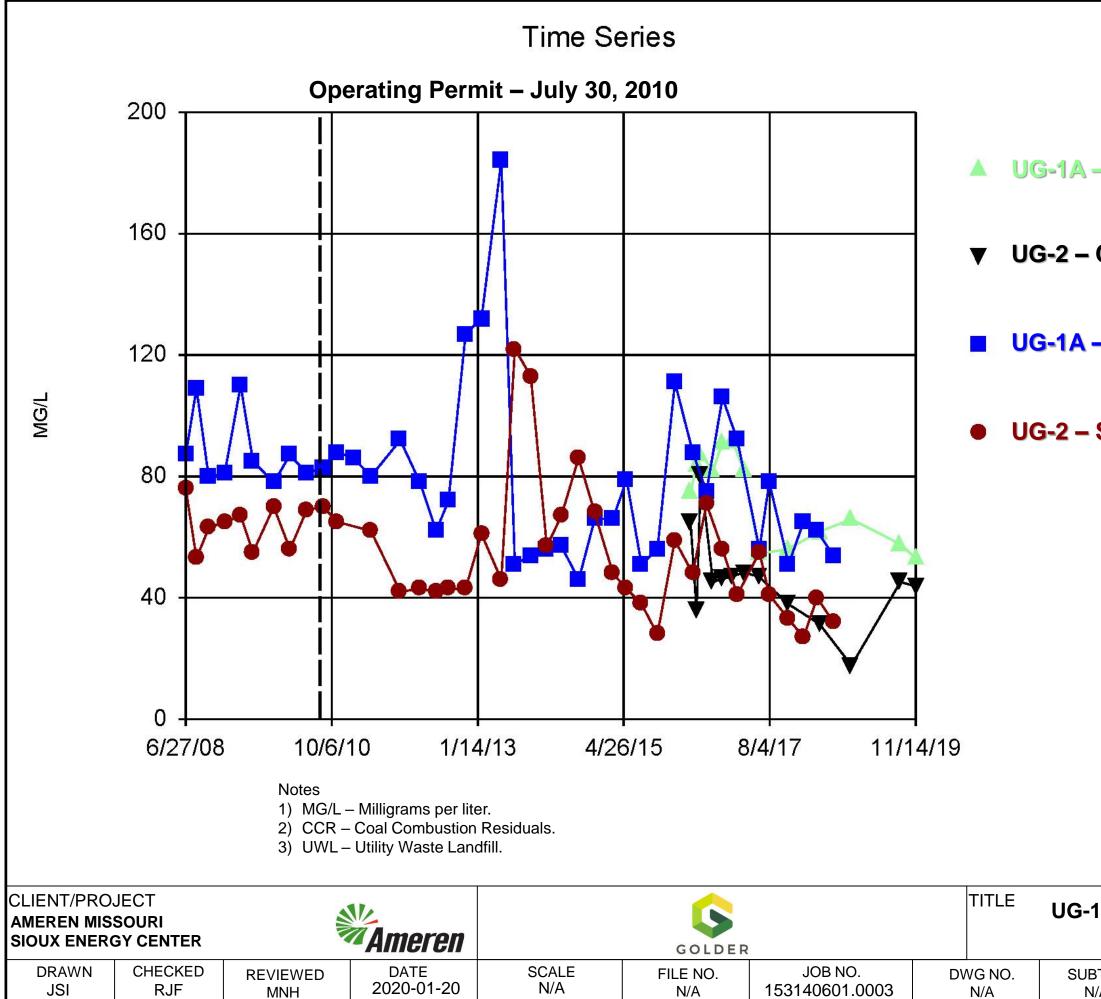
Prepared by: EMS Checked by: KAB Reviewed by: MNH

## Figures



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Sioux Energy Center Property Boundary									
Surface	Impoundments								
	SCPB - Lined Fly Ash Surface Impoundment								
	SCPA - Unlined Bottom Ash Surface Impoundment								
Utility W	tility Waste Landfill (UWL)								
	Active Dry CCR Disposal Area								
	Active WFGD Disposal Area								
	Active Water Recycle Pond								
	Proposed Dry CCR Disposal Area								
	Proposed WFGD Disposal Area								
	UWL Perimeter Fence								
CCR Ru	Je Monitoring Wells								
$\Phi$	Background Monitoring Well								
<b>+</b>	SCPA - Bottom Ash Surface Impoundment Monitoring Well								
+	SCPB - Fly Ash Surface Impoundment Monitoring Well								
<b>+</b>	Existing UWL Monitoring Well Currently Used for CCR Monitoring								
$\mathbf{\Phi}$	Temporary Monitoring Well for SCL4A								
Other P	iezometers and Monitoring Wells								
¢	Existing UWL Monitoring Well Not Currently Used for CCR Monitoring								
$\Phi$	Groundwater Elevation Piezometer								
¢	2006 Detailed Site Investigation Piezometer and Sample Locations								
NOTE	S								
<ul> <li>3.) WFGD - WET FLUE GAS DESULFURIZATION.</li> <li>4.) CCR - COAL COMBUSTION RESIDUALS.</li> <li>5.) UWL BOUNDARIES, DESIGNATIONS AND EXISTING MONITORING WELL LOCATIONS BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).</li> <li><b>REFERENCES</b> <ol> <li>AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.</li> <li>COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.</li> <li>AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.</li> <li>2006 PIEZOMETER AND SAMPLE LOCATIONS FROM APPENDIX 13 OF THE DETAILED GEOLOGIC AND HYDROLOGIC</li> </ol> </li> </ul>									
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**UG-1A – CCR Rule Sampling** 

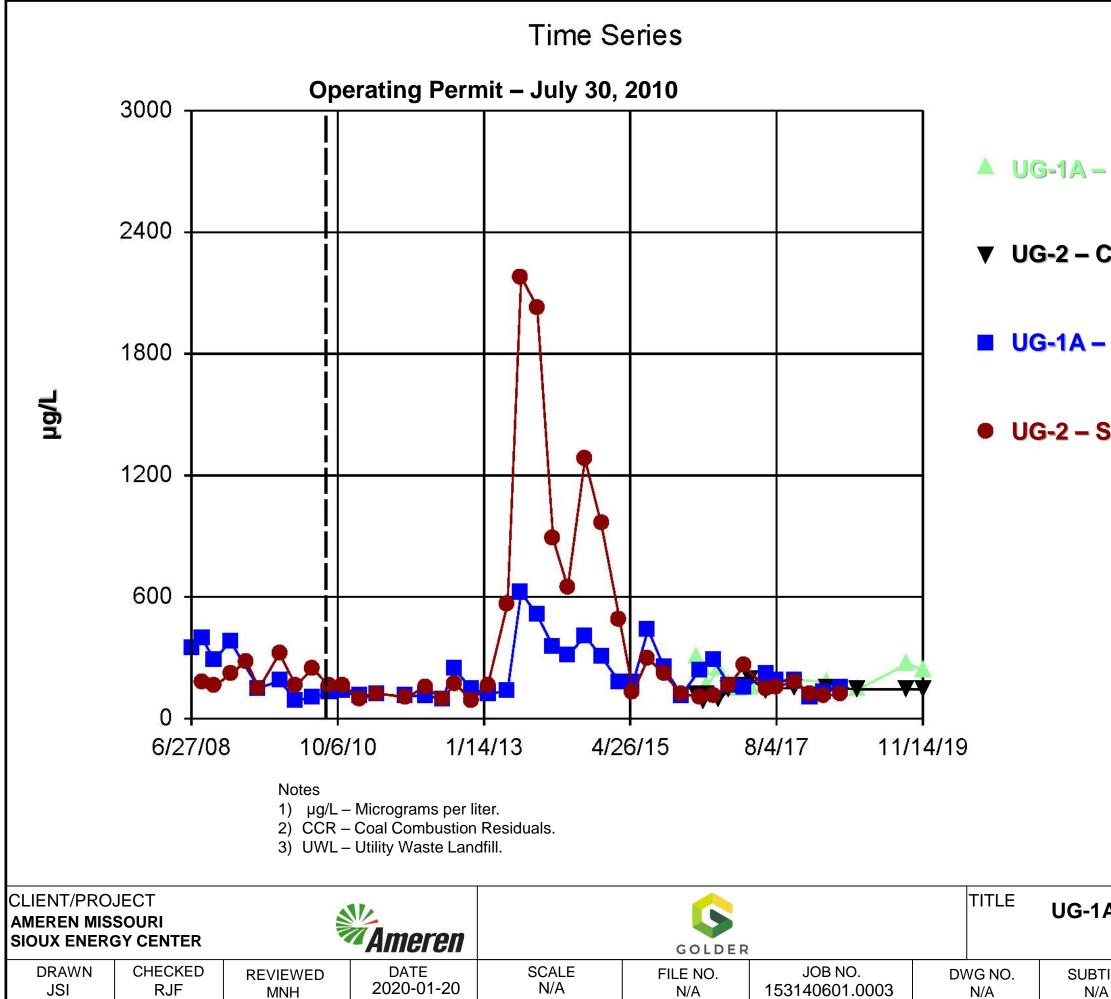
## UG-2 – CCR Rule Sampling

#### UG-1A – State UWL Sampling

## UG-2 – State UWL Sampling

#### UG-1A and UG-2 Time Series Plot for Sulfate

JBTITLE N/A	REV. NO. N/A	FIGURE 2



**UG-1A – CCR Rule Sampling** 

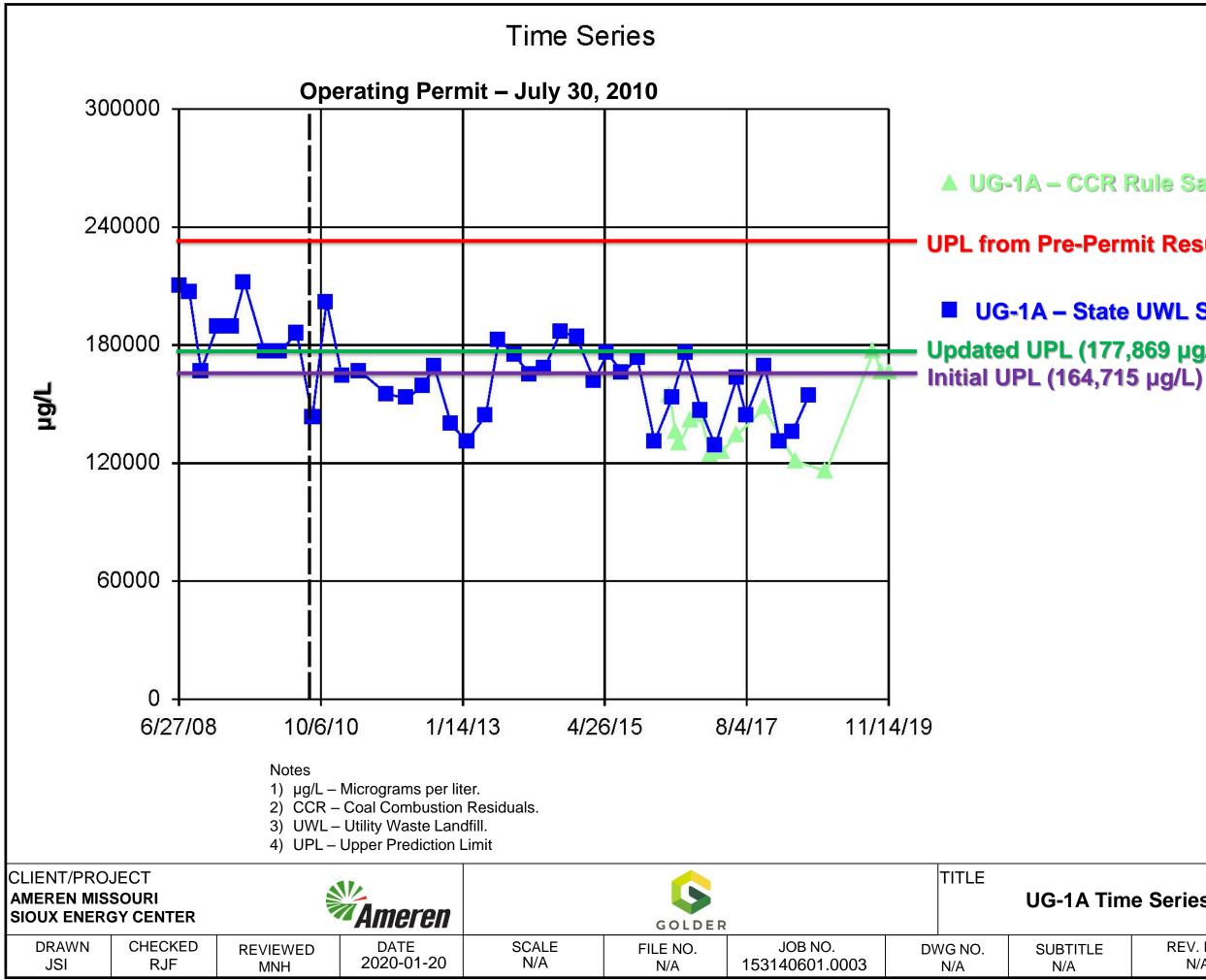
## ▼ UG-2 – CCR Rule Sampling

#### UG-1A – State UWL Sampling

## UG-2 – State UWL Sampling

#### UG-1A and UG-2 Time Series Plot for Boron

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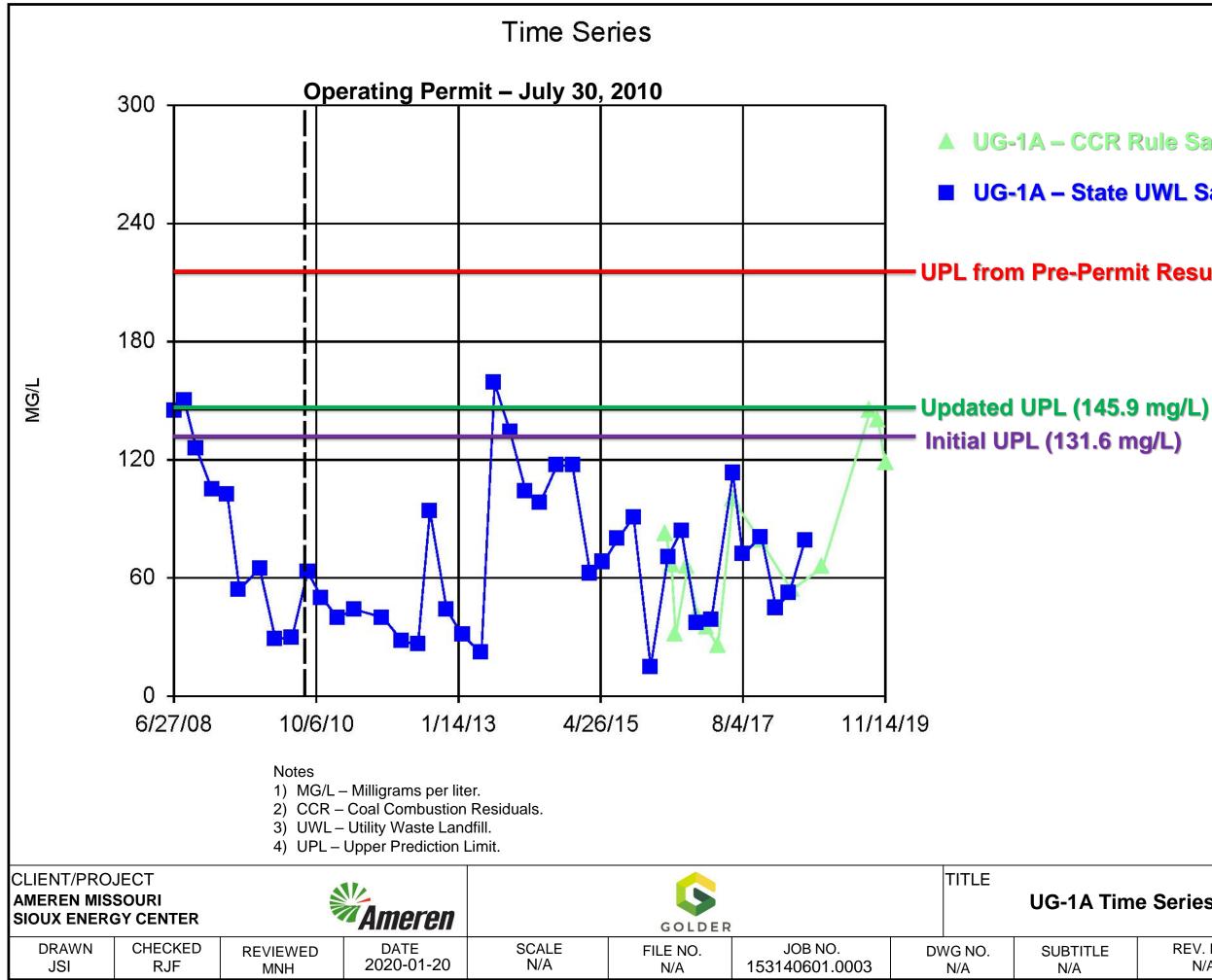
#### UG-1A – CCR Rule Sampling

#### UPL from Pre-Permit Results (233,576 µg/L)

## UG-1A – State UWL Sampling Updated UPL (177,869 µg/L)

#### **UG-1A Time Series Plot for Calcium**

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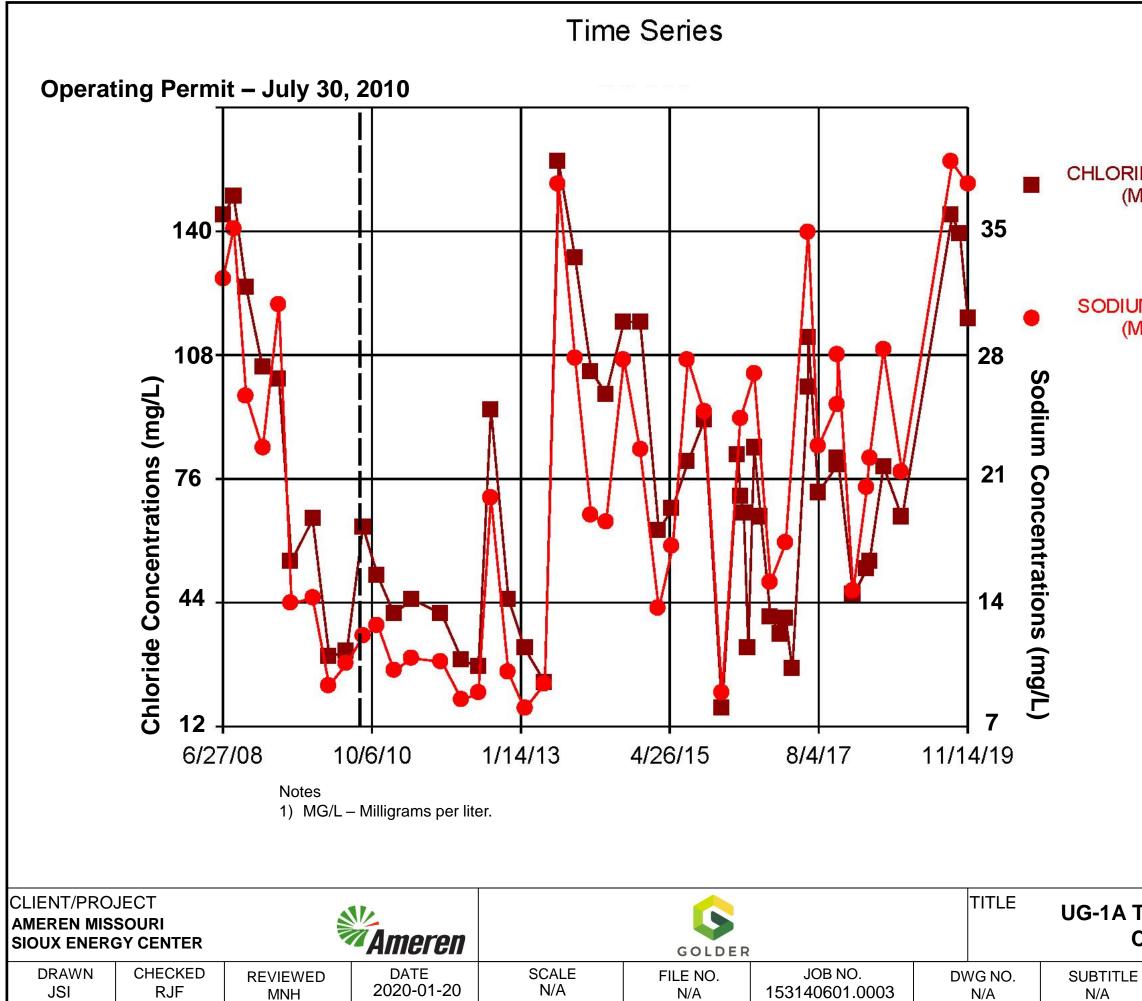
#### ▲ UG-1A – CCR Rule Sampling

#### UG-1A – State UWL Sampling

#### - UPL from Pre-Permit Results (215.5 mg/L)

#### **UG-1A Time Series Plot for Chloride**

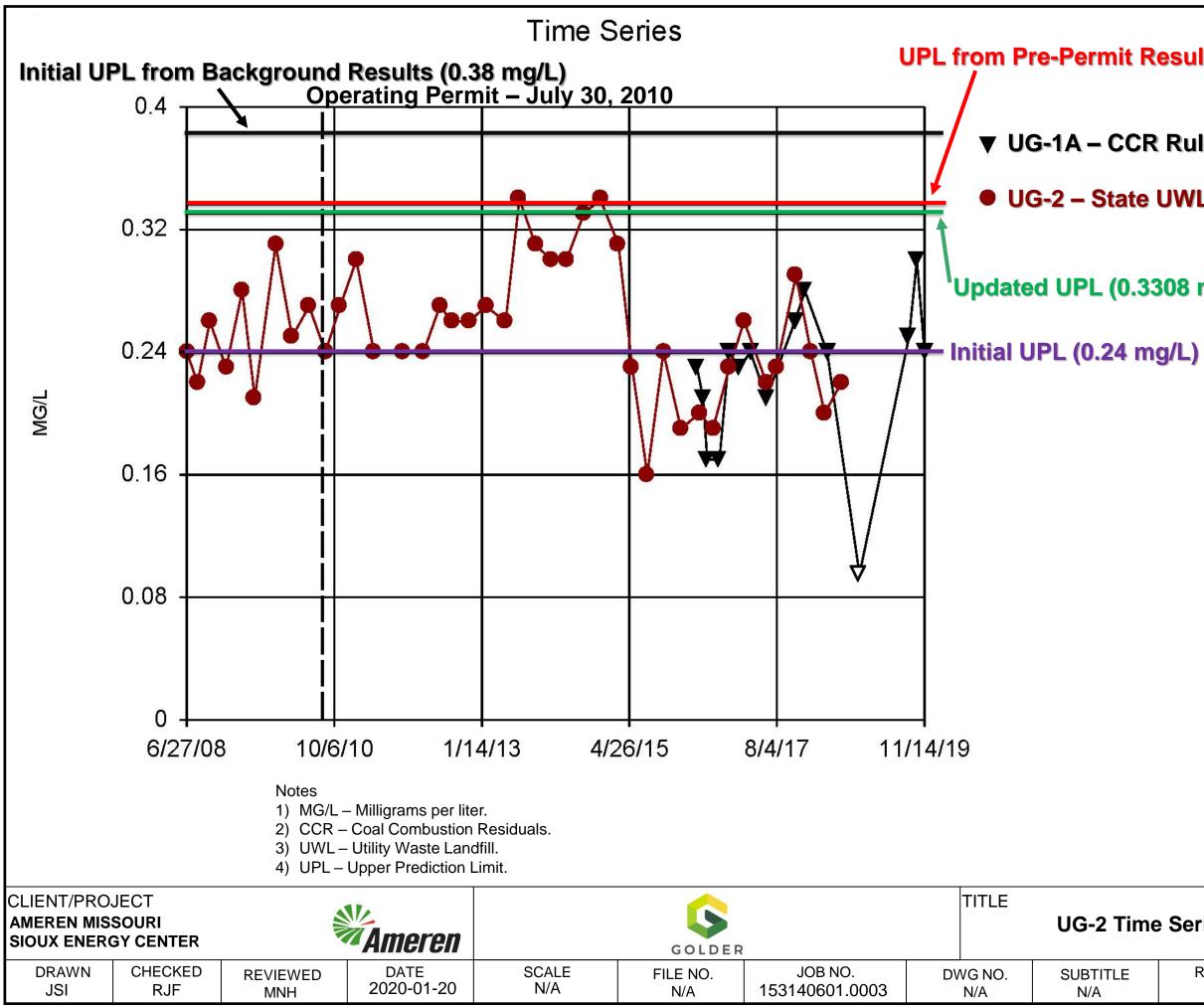
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CHLORIDE, TOTAL (MG/L)

SODIUM, TOTAL (MG/L)

#### **UG-1A Time Series Plot Comparing Chloride and Sodium**

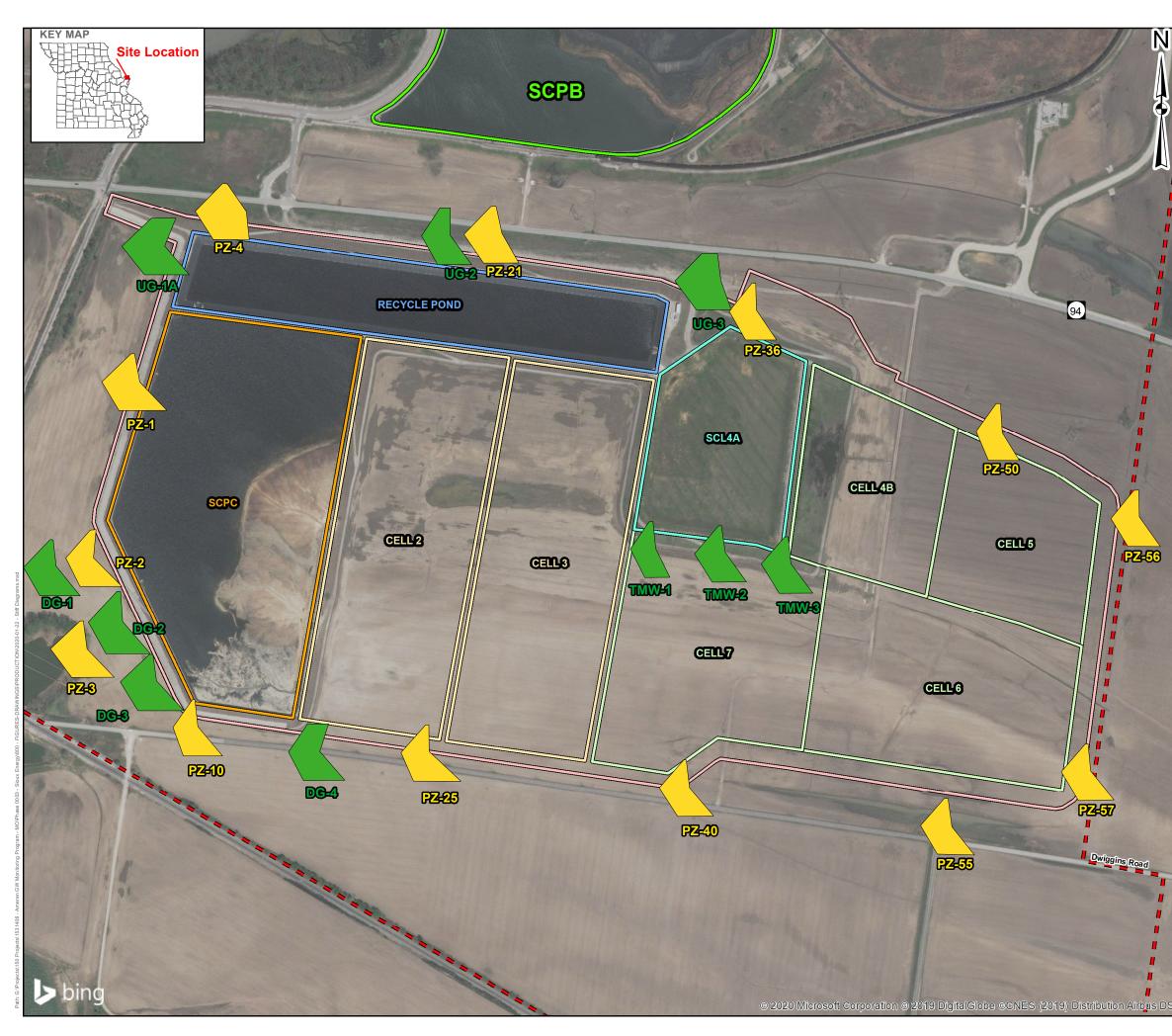


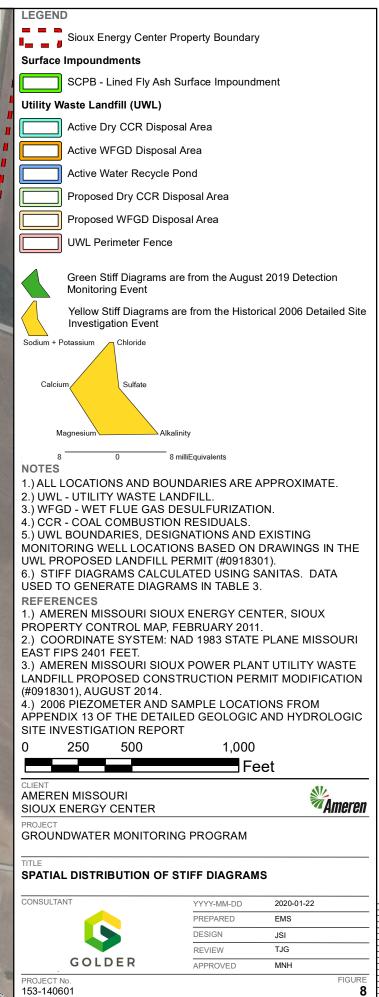
#### UPL from Pre-Permit Results (0.3371 mg/L)

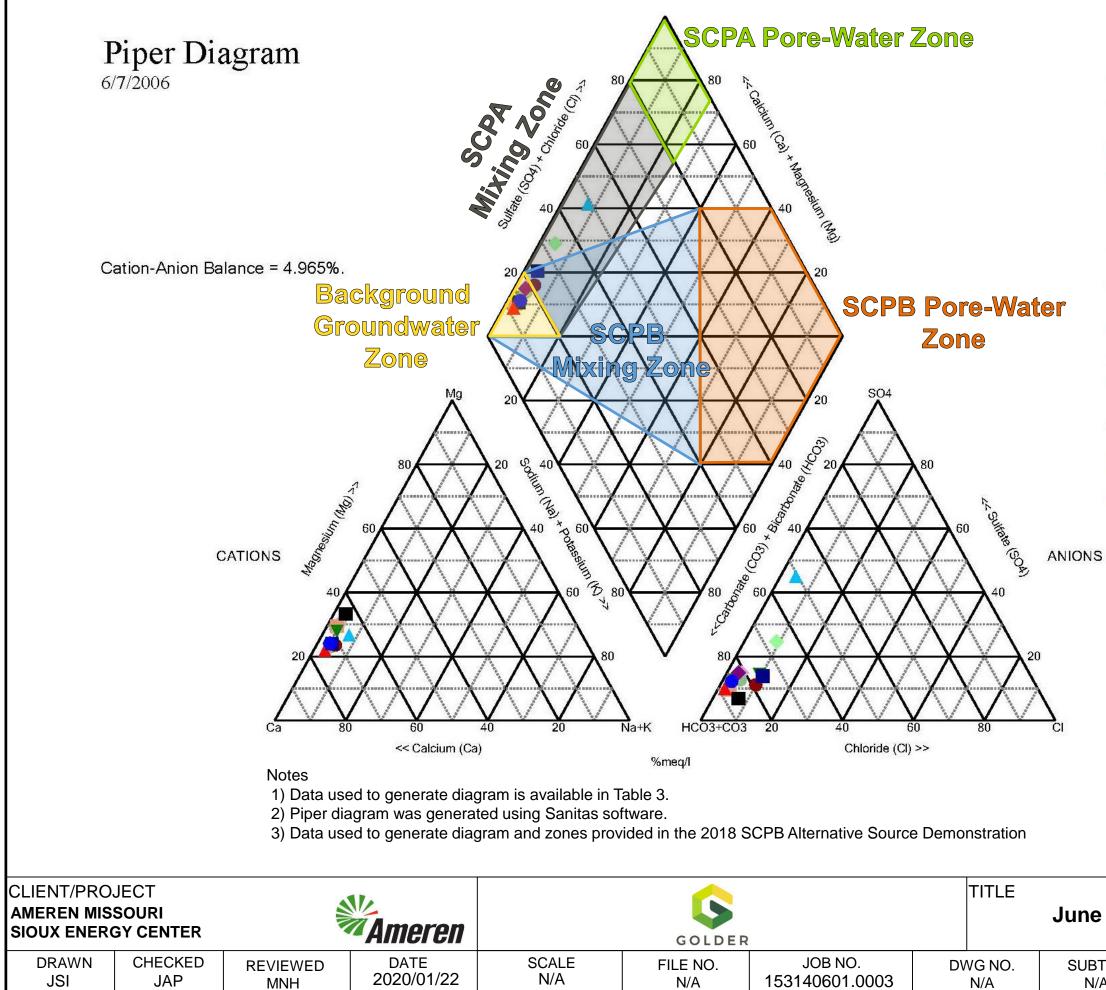
- ▼ UG-1A CCR Rule Sampling
- UG-2 State UWL Sampling
- <sup>1</sup>Updated UPL (0.3308 mg/L)

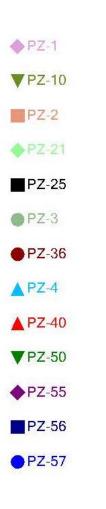
#### **UG-2 Time Series Plot for Fluoride**

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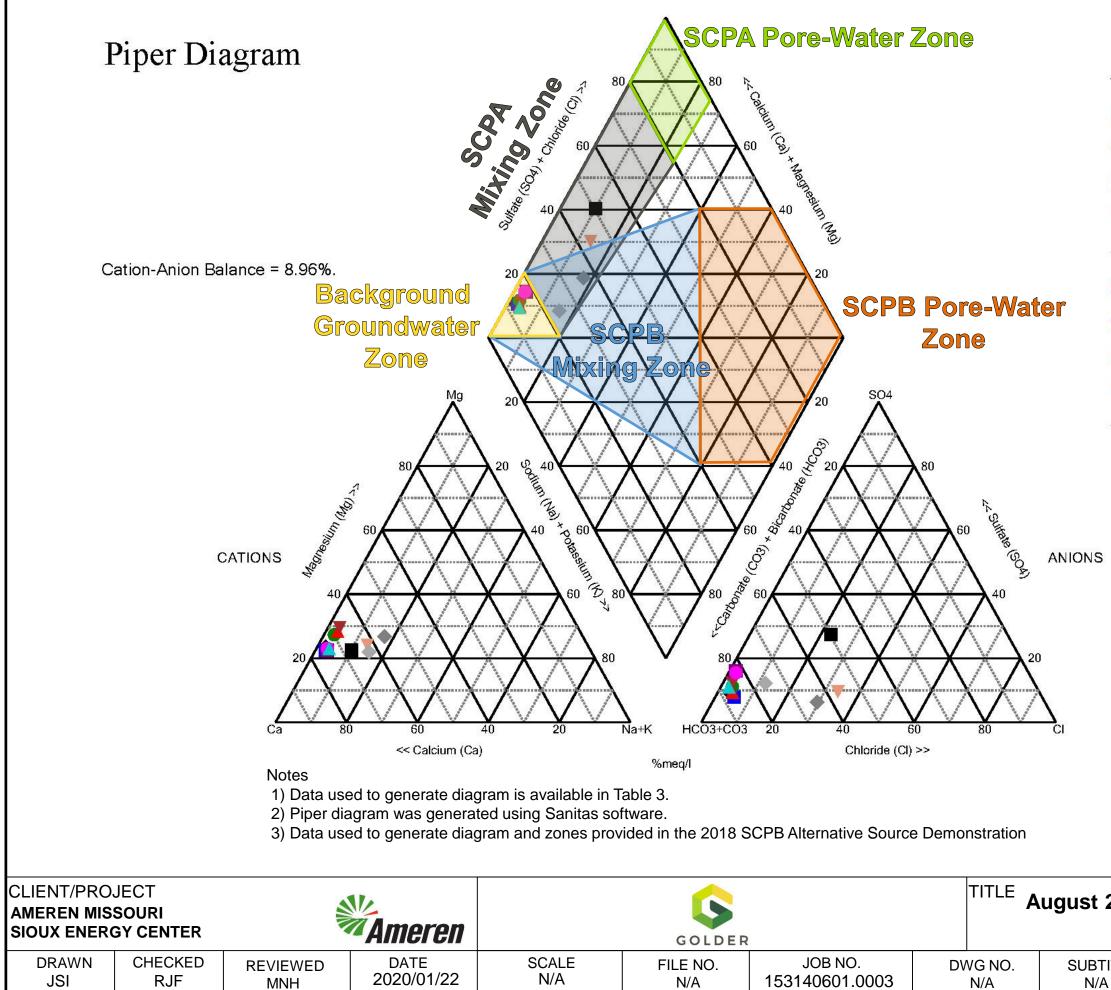






#### June 2006 - Historical Piper Diagram

BTITLE N/A	REV. NO. N/A	FIGURE 9	



: 2019 -	Detection N Diagram	Ionitoring Piper
TITLE /A	REV. NO. N/A	FIGURE <b>10</b>

#### S-UG-3\* 8/19/2019

◆S-UG-2\* 8/19/2019

**V**S-UG-1A\* 8/19/2019

• S-TMW-2\* 8/19/2019 ▲ S-TMW-3\* 8/19/2019

S-TMW-1\* 8/19/2019

VS-DG-3\* 8/19/2019 ◆S-DG-4\* 8/19/2019

• S-DG-1\* 8/19/2019

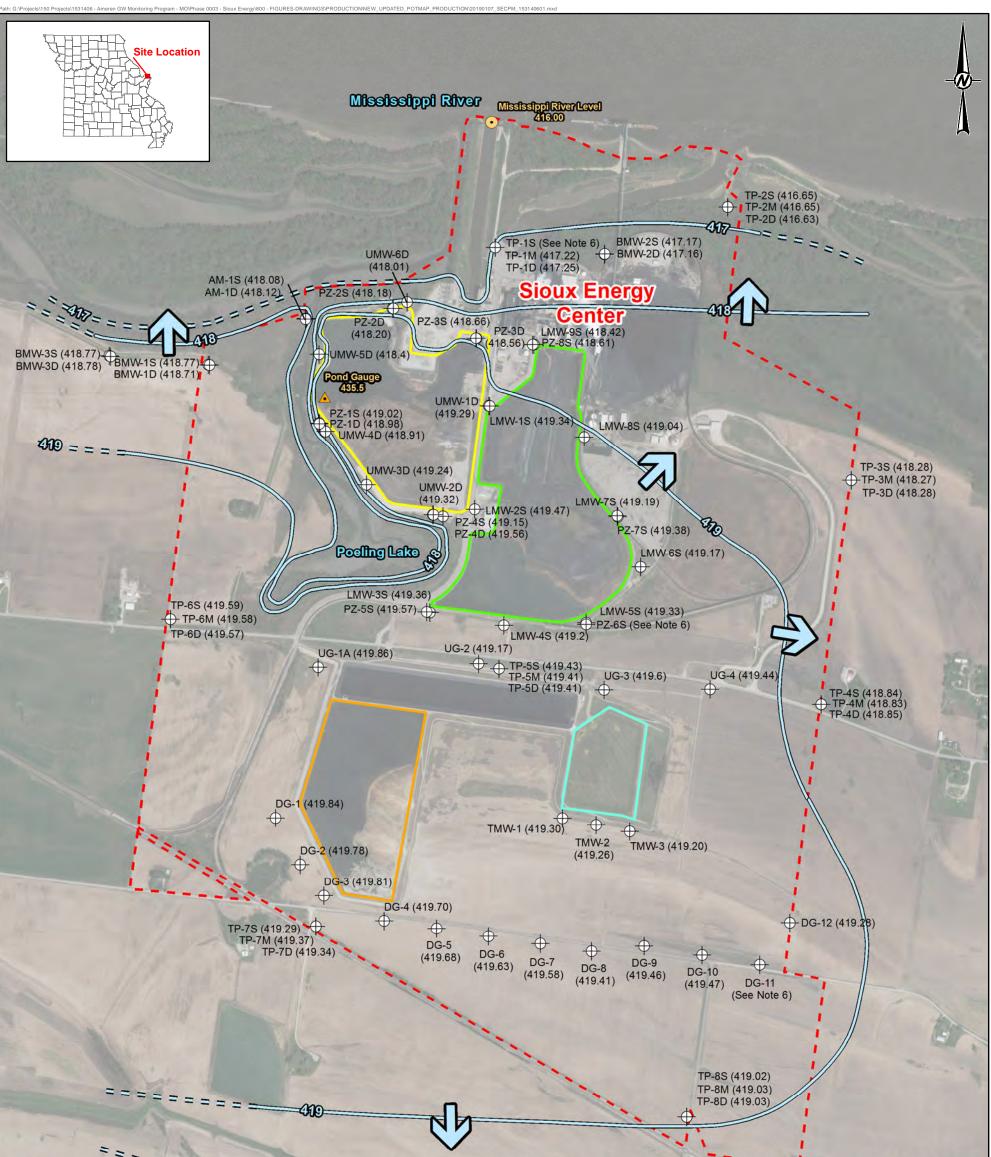
▲ S-DG-2\* 8/19/2019

◆S-BMW-1S\* 8/1/2019

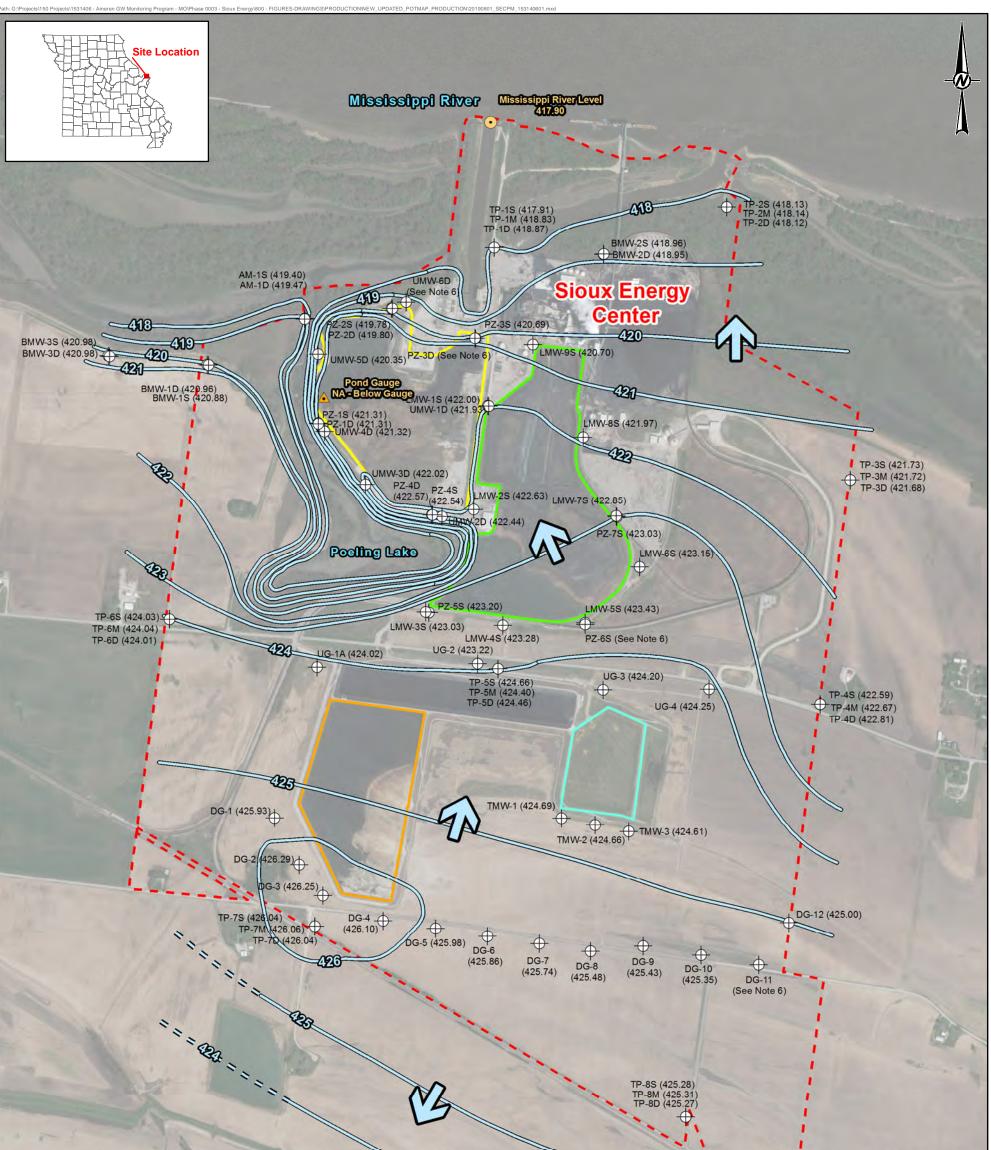
S-BMW-3S\* 8/1/2019

APPENDIX C

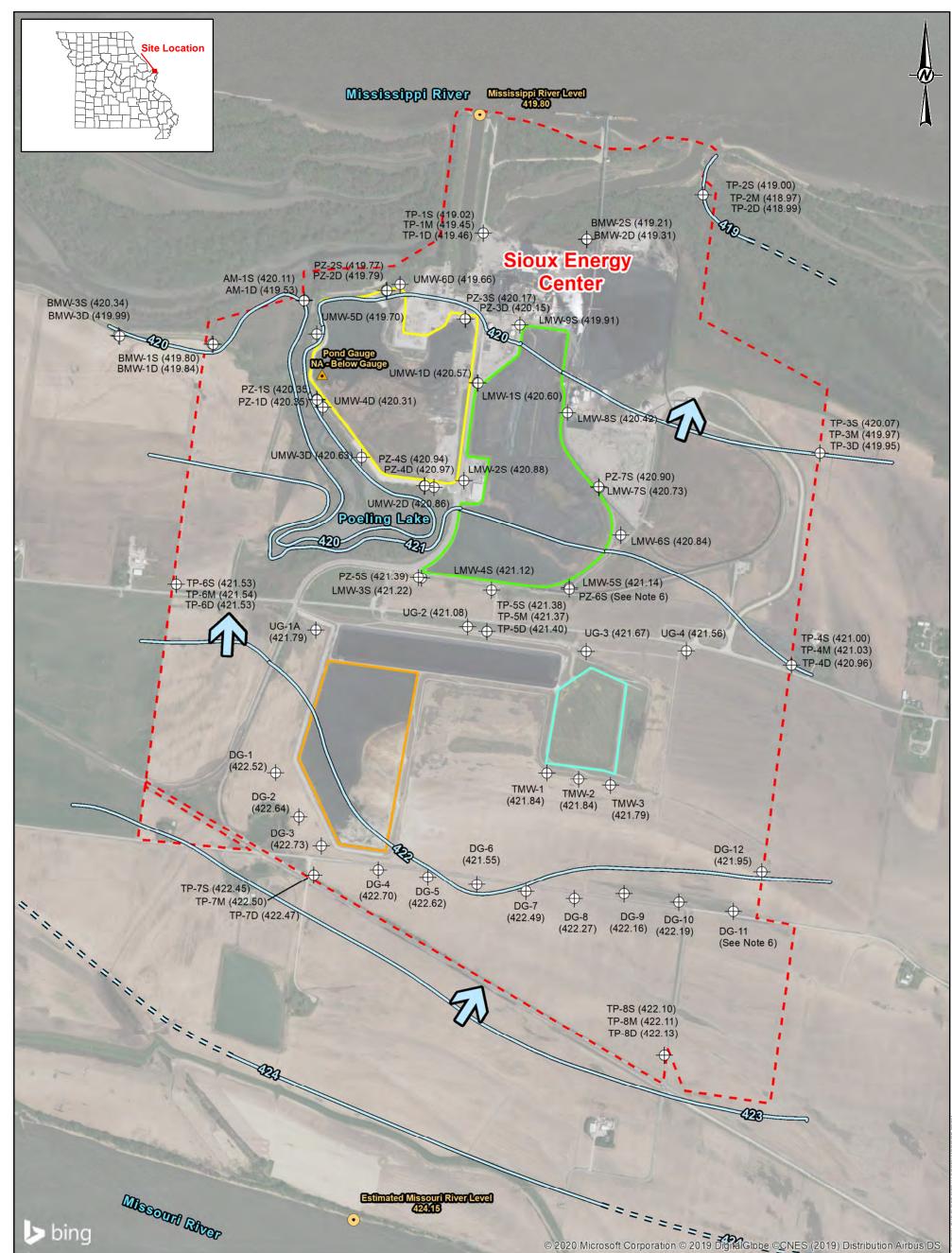
## Potentiometric Surface Maps



and the second s	= = = = = = = = = = = = = = = = = = =	Cilia Estimated Missouri River Level AUX52	soft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus D
LEGEND Sioux Energy Center Property Boundary CCR Units	Groundwater Elevation Contor (FT MSL)	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 GOLDER.	CLIENT AMEREN MISSOURI SIOUX ENERGY CENTER PROJECT
SCPA - Bottom Ash Surface Impoundment SCPB - Fly Ash Surface Impoundment	Elevation Contour (FT MSL Groundwater Elevation Contour (FT MSL) Ground/Surface Water	<ul> <li>4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.</li> <li>5.) MISSISIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.</li> <li>6.) TP-1S, PZ-6S, AND DG-11 WERE NOT USED IN POTENTIOMETRIC CONTOURING.</li> </ul> <b>REFERENCE</b>	CCR GROUNDWATER MONITORING PROGRAM
SCPC - WFGD Surface Impoundment SCL4A - Dry CCR Disposal Area	Measurement Locations SCPA Surface Impoundmen Pond Gauge River Gauge Location	<ol> <li>AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.</li> <li>COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.</li> <li>USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965</li> </ol>	CONSUL*         YYYY-MM-DD         2020-01-24           PREPARED         JSI           DESIGN         JSI
Groundwater Flow Direction	Monitoring Well or Piezometer	(ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450). 0 500 1,000 1,500 2,000 Feet	GOLDER         REVIEW         AMM           PROJECT No.         PHASE         MNH           153-1406         0003         P1



bing	WI RINGO	Estimated Missouri River/Level L23.83	oft Corporation © 2019 DigitalGlobe ©CNES (2019) E	
LEGEND  Sioux Energy Center  Property Boundary	Groundwater Elevation Contour (FT MSL)		CLIENT AMEREN MISSOURI SIOUX ENERGY CENTER	<b>M</b> Ameren
CCR Units	= = Interred Groundwater	<ol> <li>GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.</li> <li>MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.</li> </ol>	PROJECT CCR GROUNDWATER MONITORING PROGRAM	M
SCPB - Fly Ash Surface	Ground/Surface Water	<ul> <li>5.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.</li> <li>6.) DG-11, PZ-3D, PZ-6S, AND UMW-6D WERE NOT USED IN POTENTIOMETRIC CONTOURING.</li> <li>REFERENCE</li> </ul>	TITLE AUGUST 1, 2019 POTENTIOMETRIC SURFACE	MAP
SCPC - WFGD Surface		1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL	CONSULTANT YYYY-MM-DD	2019-10-09
Impoundment	Pond Gauge	MAP, FEBRUARY 2011. 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS	PREPARED	EMS
SCL4A - Dry CCR Disposal Area	-	2,401 FEET. 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965	DESIGN	JSI
<b>—</b> • • • •		(ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).	REVIEW	AMM
Groundwater Flow Direction	Piezometer	0 500 1,000 1,500 2,000	GOLDER APPROVED	MNH
		Feet	PROJECT No. PHASE 153-1406 0003	FIGUR



#### LEGEND

LEGEND	NOTES							
		(ET MOL)		<ol> <li>ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.</li> <li>GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).</li> </ol>				
CCR Units	= =	Inferred Groundwater Elevation Contour (FT MSL)	4.) MISSO	URI RIVER E	LEVATION ES	TIMATED BAS	S OBTAINED BY GOLDER. SED ON NEARBY UNITED .UGING LOCATIONS.	
SCPA - Bottom Ash Surface Impoundment		Groundwater Elevation Contour (FT MSL)	5.) MISSIS	SIPPI RIVER	ELEVATION I	PROVIDED BY	AMEREN MISSOURI.	G.
SCPB - Fly Ash Surface Impoundment		d/Surface Water	REFER	ENCE				
SCPC - WFGD Surface	Measu	Measurement Locations		1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL				
Impoundment      SCL4A - Dry CCR Disposal		SCPA Surface Impoundment Pond Gauge	2.) ĆOORE	AP, FEBRUARY 2011. )COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST F			NE MISSOURI EAST FIPS	
Area	•	River Gauge Location	2,401 FEET. 3.) USGS NATIONAL WATER INFORMATION SYSTEM, US (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON)					
Groundwater Flow Direction	$\oplus$	Monitoring Well or Piezometer	0	500	1,000	1,500	2,000	,
							Feet	

#### CLIENT AMEREN MISSOURI SIOUX ENERGY CENTER



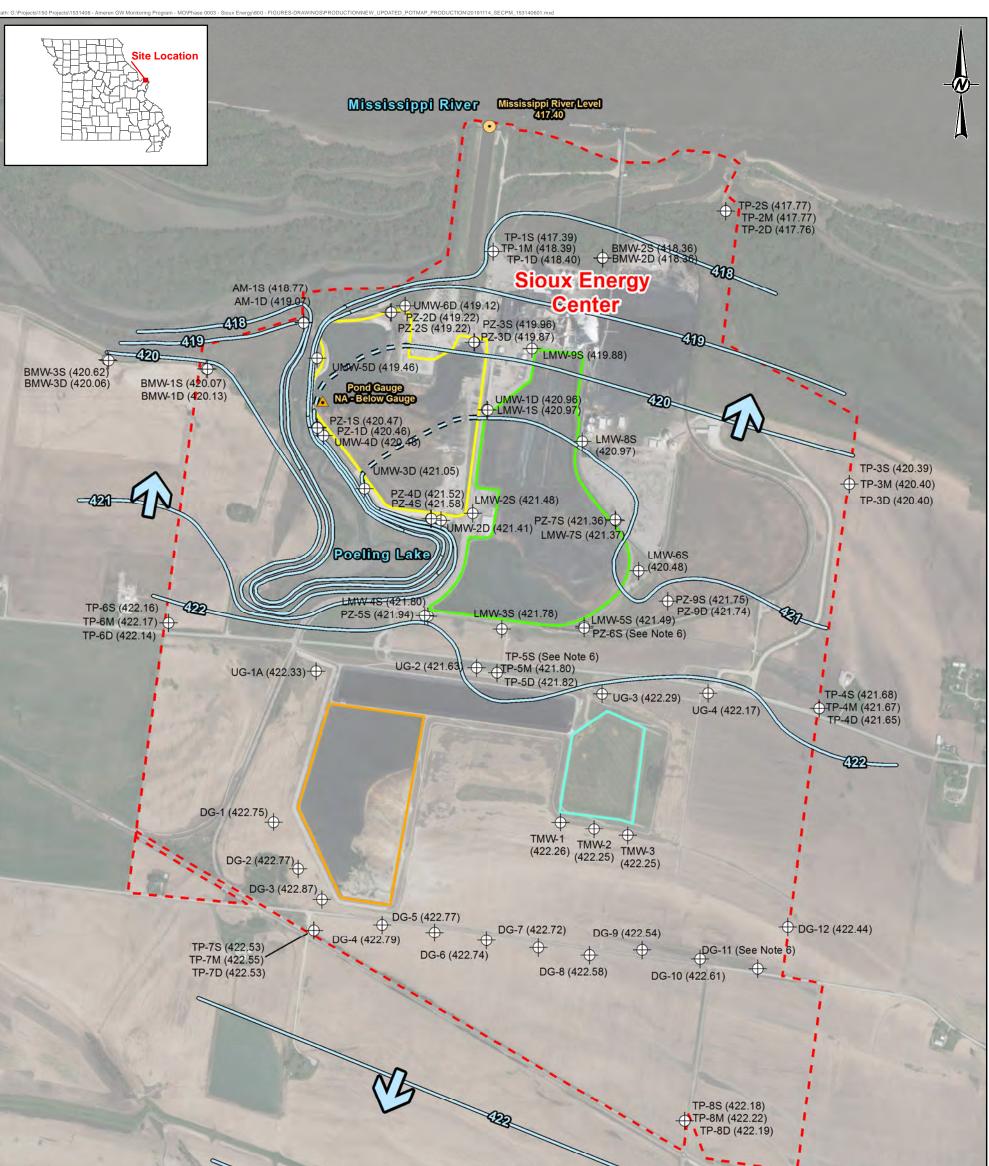
#### PROJE

CCR GROUNDWATER MONITORING PROGRAM

TITLE

#### **OCTOBER 1, 2019 POTENTIOMETRIC SURFACE MAP**

ITROL	CONSULTANT	<u> </u>	YYYY-MM-DD	2019-10-21	<u>.</u>
6	<b>_</b>		PREPARED	AMM	
35965	GOLDER		DESIGN	JSI	
7450).			REVIEW	BCW	
			APPROVED	MNH	
	PROJECT No. 153-1406	PHASE 0003			FIGURE



DED.	M	Ca la	
bing	Estimated Missouri River Level 420.67	© 2020 Microsoft Corporation © 2019 DigitalGlobe ©CNES (2019) Distribution Airbus D	DS

Ameren

FIGURE P4

LEGEND  Sioux Energy Center  Type Property Boundary		<ul> <li>1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.</li> <li>2.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).</li> <li>3.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.</li> <li>4.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED</li> <li>STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.</li> </ul>		CLIENT AMEREN MISSOURI SIOUX ENERGY CENTER	
CCR Units SCPA - Bottom Ash Surface Impoundment SCPB - Fly Ash Surface Impoundment	<ul> <li>= Inferred Groundwater Elevation Contour (FT MSL)</li> <li>3.) GROUNDWATER ELEVATION 4.) MISSOURI RIVER ELEVATION STATES GEOLOGICAL SURVEY (I</li> </ul>			PROJECT CCR GROUNDWATER MONITORING PROGRAM	
	Contour (FT MSL) 6.) DG-11, PZ-6S AND TP-5S WEF Contour (FT MSL) CONTOURING.	N PROVIDED BY AMEREN MISSOURI. E NOT USED IN POTENTIOMETRIC	TITLE NOVEMBER 13, 2019 POTENTIOMETRIC SURFACE MAP		
SCPC - WFGD Surface		IERGY CENTER, SIOUX PROPERTY CONTROL	CONSULTANT	YYYY-MM-DD	2020-01-07
Impoundment     SCL4A - Dry CCR Disposal		983 STATE PLANE MISSOURI EAST FIPS		PREPARED	EMS
Area		EE I. SS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 ARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).		DESIGN	JSI
Groundwater Flow	Monitoring Well or	JIS), 05587498 (ALTON), GRAFTON (05587450).	COLDER	REVIEW	TJG
Direction	$\Psi$ Piezometer 0 500 1,000	1,500 2,000	GOLDER	APPROVED	CMR
		Feet	PROJECT No. PHASE 153-140601 0003		



golder.com