



REPORT

# 2017 ANNUAL GROUNDWATER MONITORING REPORT

SCL4A - Utility Waste Landfill Cell 4A, Sioux Energy  
Center

St. Charles County, Missouri, USA



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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) Cell 4A (SCL4A) at the Sioux Energy Center (SEC) is subject to the requirements of the CCR Rule. This is the first Annual Report for the SCL4A and describes CCR Rule groundwater monitoring activities through December 31, 2017.

A groundwater monitoring well network was designed and installed for the SCL4A to meet the requirements of the CCR Rule. The well network consists of two background monitoring wells and four downgradient monitoring wells that were installed in December 2015, March 2016, and November 2016. Eight independent baseline sampling events were completed using this well network to sample and test for all Appendix III and Appendix IV parameters, as required by the CCR Rule. The first Detection Monitoring sampling event for the SEC was completed November 13-15, 2017. Statistical analysis of the Detection Monitoring data will be performed in 2018. The SCL4A will continue Detection Monitoring on a semi-annual basis in accordance with the CCR Rule. As of December 31, 2017, the SCL4A groundwater monitoring program status remains in Detection Monitoring.



## 2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the SCL4A. The groundwater monitoring system consists of six (6) monitoring wells screened in the uppermost aquifer (alluvial aquifer). One (1) existing monitoring well (UG-3) was installed by GREDELL Engineering Resources, Inc., in December 2007 as a part of the state UWL monitoring program. Five monitoring wells (TMW-1, TMW-2, TMW-3, BMW-1S and BMW-3S) were installed by Cascade Drilling LP using rotasonic drilling techniques under the direct supervision of a Golder Geologist or Engineer. Monitoring wells were installed in accordance with Missouri Department of Natural Resources (MDNR) well construction rules (10 CSR 23-4.060 Construction Standards for Monitoring Wells). A summary of groundwater monitoring well construction details is provided in **Table 1** and **Appendix A**.

### 2.1 Background Monitoring Well Locations

Background Monitoring wells for the SCL4A consist of BMW-1S and BMW-3S. The Rule (§257.91(a)(1)) requires that background groundwater monitoring wells “*Accurately represent the quality of background groundwater that has not been affected by leakage from a CCR unit.*” The Rule allows background monitoring wells that are not hydraulically upgradient where hydrogeological conditions preclude it, and/or where sampling at other monitoring wells will provide an indication of background groundwater quality that is as representative as, or more representative than, that provided by upgradient monitoring well locations. The groundwater flow direction observed in the alluvial aquifer is generally from either the Mississippi River towards the Missouri River or from the Missouri River towards the Mississippi River with a slight eastward component in the downgradient river direction. Alluvial aquifer flow is locally influenced by water levels in the SCPA and the Mississippi and Missouri River levels.

As shown in **Figure 1**, the background monitoring wells BMW-1S and BMW-3S are northwest of the SCL4A at a location south of the Mississippi River and provide background groundwater quality for SCL4A monitoring.

### 2.2 Downgradient Monitoring Well Locations

Downgradient monitoring wells are located around the SCL4A to monitor downgradient water quality. **Figure 1** shows that the downgradient well network consists of four groundwater monitoring wells (UG-3, TMW-1, TMW-2, and TMW-3) around the SCL4A at locations that accurately represent the quality of groundwater passing the waste boundary of the CCR Unit.



### 3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

#### 3.1 Baseline Sampling Events (Background Events)

As required by the CCR Rule, eight baseline groundwater sampling events were completed prior to October 17, 2017. Groundwater sampling was completed by Golder in accordance with the SCL4A Groundwater Monitoring Plan (GMP). As required by the CCR Rule, baseline sampling was completed for all Appendix III and Appendix IV parameters. Groundwater sampling and field parameter results from the initial baseline sampling are provided in **Appendix B** and **Tables 2-9**.

#### 3.2 Detection Monitoring

Detection Monitoring samples for the SEC were collected from the groundwater monitoring wells on November 13-15, 2017. As required by the CCR Rule, testing was completed for all Appendix III analytes. Groundwater sampling and field parameter results from the November 2017 Detection Monitoring event are provided in **Appendix B** and **Table 10**. Statistical analyses to evaluate Statistically Significant Increases (SSI) over background in the November 2017 Detection Monitoring data were not completed in 2017. Results of the statistical evaluation will be included in the 2018 Annual Report.

#### 3.3 Groundwater Elevation, Flow Rate and Direction

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

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix C**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and directly controlled by the river stages of the 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 towards the Mississippi and Missouri Rivers, depending on river levels.

Groundwater flow direction and gradient were estimated for the downgradient CCR monitoring wells using the USEPA’s On-line Tool for Site Assessment Calculation for Hydraulic Gradient (Magnitude and Direction) (USEPA, 2016). Results from this assessment indicate that while groundwater flow direction is variable and gradients are relatively flat, the overall net groundwater flow at the SCL4A was toward the south, flowing toward the Missouri River. Horizontal gradients calculated by the program range from 0.0001 to 0.0012 feet/foot with an estimated net annual groundwater velocity of approximately 34 feet per year.



#### 4.0 STATUS OF THE GROUNDWATER MONITORING PROGRAM

As required by the CCR Rule prior to the October 17, 2017 deadline, the following was completed; (1) a Groundwater Monitoring Well System was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, and (3) a GMP was prepared recording the design, installation, development, sampling procedures, as well as statistical methods and placed in the owner's operating record. The first Detection Monitoring sampling event for the SEC was completed on November 13-15, 2017. A summary including the number of groundwater samples that were collected for analysis, the dates the samples were collected, and whether the sample was required by baseline, detection, or assessment monitoring is provided below in **Table 11**. According to the CCR Rule, statistical evaluation for these samples must be completed within 90 days of completing sampling and analysis. Statistical analysis will be completed by January 15, 2018 and included in future reports and notifications as required by the CCR Rule. Semi-annual Detection Monitoring will continue as required by the CCR Rule. Section 5.0 provides discussion of activities planned for 2018.

**Table 11 – Summary of Groundwater Sampling Dates**

Sampling Event	Groundwater Monitoring Wells						Baseline, Detection or Assessment Monitoring
	BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3	
	Date of Sample Collection						
Baseline Event 1	3/16/2016	11/16/2016	5/11/2016	5/11/2016	5/11/2016	5/11/2016	Baseline
Baseline Event 2	5/9/2016	12/8/2016	6/14/2016	6/14/2016	6/14/2016	6/14/2016	Baseline
Baseline Event 3	7/5/2016	1/3/2017	7/8/2016	7/8/2016	7/8/2016	7/8/2016	Baseline
Baseline Event 4	9/14/2016	2/2/2017	9/15/2016	9/15/2016	9/15/2016	9/15/2016	Baseline
Baseline Event 5	11/7/2016	3/8/2017	11/9/2016	11/9/2016	11/9/2016	11/9/2016	Baseline
Baseline Event 6	1/3/2017	4/5/2017	1/4/2017	1/4/2017	1/4/2017	1/4/2017	Baseline
Baseline Event 7	3/8/2017	6/5/2017	3/9/2017	3/10/2017	3/10/2017	3/10/2017	Baseline
Baseline Event 8	6/5/2017	6/26/2017	6/6/2017	6/6/2017	6/6/2017	6/6/2017	Baseline
November 2017 Detection Monitoring Event	11/13/2017	11/13/2017	11/15/2017	11/15/2017	11/15/2017	11/15/2017	Detection
Total Number of Samples Collected	9	9	9	9	9	9	NA

Notes:

- 1) Baseline Events sampled for all Appendix III and Appendix IV parameters.
- 2) The November 2017 Detection Monitoring Event sampled for Appendix III parameters.
- 3) NA – Not Applicable

#### 4.1 Sampling Issues and Monitoring Well Decommissioning

Some sampling issues were encountered during the baseline sampling events. BMW-3S was installed to replace BMW-2S in November 2016. BMW-2S was replaced due to concern that it was not providing groundwater samples that were representative of background groundwater conditions at the SEC. Groundwater at the SCL4A generally flows south from the SCL4A to the Missouri River. However, at times, groundwater flows from the areas surrounding the SCPB and SCPA to the Mississippi River to the north. Therefore, BMW-2S is no longer used for groundwater monitoring (only for piezometric level measurement)



and BMW-3S was installed as a second background well and located to the west of the CCR units at the SEC.

From approximately April 30, 2017 to May 15, 2017, some of the monitoring wells at the SEC were under water due to the flooding of the Mississippi and Missouri Rivers. At the SCL4A, the following wells were submerged by flood water: UG-3, TMW-1, TMW-2, TMW-3, BMW-3S, and BMW-1S. On May 19, 2017, Golder performed a post-flood monitoring well inspection at the SEC and found that none of the SCL4A monitoring wells sustained flood damage. Due to access problems resulting from the flood, the wells were not sampled until June 5, 2017. No other notable sampling issues were encountered during the Baseline or Detection Monitoring sampling.



## 5.0 ACTIVITIES PLANNED FOR 2018

Detection Monitoring sampling is currently scheduled to be completed semi-annually in the second and fourth quarters of 2018, but may be changed due to site conditions (e.g., flooding, access, etc.). Statistical analysis of the November 2017 Detection Monitoring data will be completed by January 15, 2018. If it is determined that there is an SSI over background, Ameren will collect verification samples for all SSIs. Additionally, within 90 days of determining an SSI, Ameren would either establish an Assessment Monitoring program or demonstrate that the SSI was the result of error, or caused by an alternate source.





## 6.0 CLOSING

### GOLDER ASSOCIATES INC.

Mark Haddock, P.E., R.G.  
Principal, Practice Leader

JSI/RJF/MNH

Jeffrey Ingram, R.G.  
Project Geologist

# **TABLES**

**Table 1**  
**Monitoring Well Construction Details**  
**SCL4A - UWL Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

Well ID	Date Installed	Location <sup>4</sup>		Top of Casing Elevation	Ground Surface Elevation	Top of Screen	Bottom of Screen	Base of Well	Total Depth
		Northing	Easting	(FT MSL) <sup>5</sup>	(FT MSL) <sup>5</sup>	(FT MSL) <sup>5</sup>	(FT MSL) <sup>5</sup>	(FT MSL) <sup>5</sup>	(FT BGS) <sup>5</sup>
UG-3*	12/16/2007	1118608.5	880519.4	429.71	427.1	410.0	399.7	399.7	27.4
TMW-1	4/5/2016	1117385.1	880121.2	428.08	425.9	409.4	399.6	399.2	26.7
TMW-2	4/5/2016	1117320.7	880442.9	428.17	425.9	408.0	398.2	397.8	28.1
TMW-3	4/5/2016	1117259.2	880762.4	427.88	425.7	408.0	398.2	397.8	27.9
BMW-1S	12/8/2015	1121709.2	876755.6	427.77	426.0	412.0	402.2	401.8	24.2
BMW-3S	11/8/2016	1121792.9	875809.5	426.69	424.1	410.2	400.4	400.0	24.2

Notes:

- 1.) All elevations and coordinates were surveyed on January 14, 2016 and December 8, 2016 by Zahner and Associates, Inc.
- 2.) FT MSL = Feet Above Mean Sea Level.
- 3.) FT BGS = Feet Below Ground Surface.
- 4.) Horizontal Datum: State Plane Coordinates NAD83 (2000) Missouri East Zone Feet.
- 5.) Vertical Datum: NAVD88 Feet.
- 6.) \*Groundwater monitoring wells installed by GREDELL Engineering Resources and surveyed by KdG.

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Prepared By: JSI  
Checked By: JS  
Reviewed By: MNH

**Table 2**  
**Baseline Sampling Event 1 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	3/16/2016	11/16/2016	5/11/2016	5/11/2016	5/11/2016	5/11/2016
DISSOLVED OXYGEN	mg/L	0.40	1.24	0.23	0.52	0.48	0.38
pH	SU	6.84	6.75	6.61	5.83	6.10	6.29
REDOX POTENTIAL	mV	-151.2	-43.2	121.3	188.1	164.0	40.6
SPECIFIC CONDUCTIVITY	mS/cm	0.661	0.727	0.885	0.936	1.003	1.087
TURBIDITY	NTU	4.05	2.71	1.97	3.86	3.68	4.19
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	78.1 J	65.4 J	476	65.4 J	107 J	116
CALCIUM, TOTAL	µg/L	150,000	124,000	121,000	103,000	123,000	111,000
CHLORIDE, TOTAL	mg/L	8.0	10.1	38.2	3.8	3.9	3.1
FLUORIDE, TOTAL	mg/L	0.26	0.33	0.35	0.33	0.38	0.31
SULFATE, TOTAL	mg/L	27.8	28.2	77.3	32.6	35.5	57.0
TOTAL DISSOLVED SOLIDS	mg/L	533	438	515	368	441	484
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	ND	ND	0.14 J	0.13 J	0.12 J	0.10 J
ARSENIC, TOTAL	µg/L	0.99 J	1.0	0.40 J	0.34 J	2.7	2.8
BARIUM, TOTAL	µg/L	141	194	214	192	240	181
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	0.16 J	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.40 J	0.50 J	ND	0.74 J	0.69 J	0.71 J
COBALT, TOTAL	µg/L	ND	2.0 J	1.4 J	ND	ND	0.75 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	ND	ND	29.2	24.8	29.9	33.9
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	2.1 J	6.3 J	2.5 J	ND	6.3 J	7.4 J
RADIUM [226 + 228]	pCi/L	ND	1.558	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.74 J	0.23 J	2.1	0.28 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 3**  
**Baseline Sampling Event 2 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	5/9/2016	12/8/2016	6/14/2016	6/14/2016	6/14/2016	6/14/2016
DISSOLVED OXYGEN	mg/L	1.88	0.13	0.47	0.62	0.62	0.59
pH	SU	5.53	7.11	6.97	7.06	7.30	7.31
REDOX POTENTIAL	mV	272.9	-85.8	186.0	-66.3	-126.9	-142.2
SPECIFIC CONDUCTIVITY	mS/cm	1.102	0.750	0.716	0.585	0.729	0.836
TURBIDITY	NTU	2.66	2.35	3.14	3.96	2.98	1.36
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	65.2 J	70.6 J	674	70.9 J	82.2 J	78.5 J
CALCIUM, TOTAL	µg/L	144,000	128,000	121,000	114,000	115,000	119,000
CHLORIDE, TOTAL	mg/L	8.5	12.0	34.6	2.0	2.9	2.5
FLUORIDE, TOTAL	mg/L	0.33	0.33	0.31	0.26	0.31	0.23
SULFATE, TOTAL	mg/L	26.2	32.2	108	23.2	34.7	52.4
TOTAL DISSOLVED SOLIDS	mg/L	517	447	553	411	441	487
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.064 J	0.10 J	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	1.0	1.4	0.44 J	0.59 J	3.5	2.4
BARIUM, TOTAL	µg/L	137	198	236	222	235	210
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.097 J	ND	0.40 J	0.034 J	0.12 J	ND
CHROMIUM, TOTAL	µg/L	0.44 J	0.57 J	ND	0.75 J	ND	ND
COBALT, TOTAL	µg/L	ND	1.8 J	10.3	1.1 J	1.2 J	1.2 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	ND	7.3 J	32.5	28.2	31.2	31.4
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	9.3 J	3.3 J	3.6 J	4.2 J	4.7 J
RADIUM [226 + 228]	pCi/L	ND	ND	2.420	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.74 J	ND	1.2	ND	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 4**  
**Baseline Sampling Event 3 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	7/5/2016	1/3/2017	7/8/2016	7/8/2016	7/8/2016	7/8/2016
DISSOLVED OXYGEN	mg/L	0.44	1.98	0.53	0.63	0.49	0.89
pH	SU	6.66	7.45	7.10	6.76	7.10	7.02
REDOX POTENTIAL	mV	83.3	-58.0	9.4	19.7	-27.1	-7.5
SPECIFIC CONDUCTIVITY	mS/cm	0.875	0.770	0.806	0.668	0.717	0.759
TURBIDITY	NTU	3.41	4.82	4.03	4.17	3.21	4.55
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	93.0 J	62.3 J	375	64.6 J	77.4 J	81.2 J
CALCIUM, TOTAL	µg/L	140,000	110,000	103,000	106,000	113,000	112,000
CHLORIDE, TOTAL	mg/L	8.7	8.7	44.2	2.3	3.2	2.4
FLUORIDE, TOTAL	mg/L	0.31	0.25	0.30	0.26	0.32	0.24
SULFATE, TOTAL	mg/L	30.2	24.7	61.0	25.7	34.3	51.8
TOTAL DISSOLVED SOLIDS	mg/L	526	419	506	411	445	473
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.063 J	ND	0.17 J	0.12 J	ND	ND
ARSENIC, TOTAL	µg/L	0.88 J	ND	0.33 J	0.47 J	4.7	3.3
BARIUM, TOTAL	µg/L	137	675	208	219	243	187
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.095 J	ND	0.22 J	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	0.51 J	ND	ND	0.55 J	0.45 J
COBALT, TOTAL	µg/L	ND	ND	2.4 J	1.7 J	2.1 J	2.7 J
LEAD, TOTAL	µg/L	ND	ND	4.7 J	ND	3.3 J	ND
LITHIUM, TOTAL	µg/L	5.0 J	23.8	26.9	25.1	30.1	30.4
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	2.5 J	ND	3.4 J	3.4 J	5.1 J	5.8 J
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.25 J	ND	2.6	ND	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 5**  
**Baseline Sampling Event 4 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	9/14/2016	2/2/2017	9/15/2016	9/15/2016	9/15/2016	9/15/2016
DISSOLVED OXYGEN	mg/L	1.20	0.47	0.43	0.38	0.41	0.81
pH	SU	6.90	6.59	6.19	6.72	6.75	6.69
REDOX POTENTIAL	mV	180.0	-17.0	66.1	61.0	58.5	84.9
SPECIFIC CONDUCTIVITY	mS/cm	0.774	0.580	0.904	0.680	0.843	0.910
TURBIDITY	NTU	4.61	4.90	1.59	4.65	3.12	2.13
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	165	61.5 J	342	73.7 J	80.7 J	85.8 J
CALCIUM, TOTAL	µg/L	124,000	127,000	106,000	97,300	118,000	123,000
CHLORIDE, TOTAL	mg/L	1.9	10.0	40.8	3.2	2.6	1.7
FLUORIDE, TOTAL	mg/L	0.16 J	0.37	0.28	0.26	0.29	0.22
SULFATE, TOTAL	mg/L	23.4	27.1	53.5	35.8	31.3	57.5
TOTAL DISSOLVED SOLIDS	mg/L	565	455	492	390	450	492
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.16 J	ND	0.20 J	0.16 J	ND	0.063 J
ARSENIC, TOTAL	µg/L	0.38 J	1.3	0.28 J	0.46 J	6.2	2.8
BARIUM, TOTAL	µg/L	199	146	205	188	226	206
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	0.18 J	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.53 J	0.50 J	ND	ND	0.53 J	ND
COBALT, TOTAL	µg/L	ND	2.2 J	3.3 J	1.6 J	1.9 J	1.6 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	21.0	ND	25.6	23.6	29.4	31.0
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	2.7 J	2.6 J	3.1 J	3.9 J	2.4 J	3.6 J
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	5.5	ND	2.1	ND	ND	ND
THALLIUM, TOTAL	µg/L	ND	0.041 J	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 6**  
**Baseline Sampling Event 5 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	11/7/2016	3/8/2017	11/9/2016	11/9/2016	11/9/2016	11/9/2016
DISSOLVED OXYGEN	mg/L	0.86	0.52	0.17	0.39	0.32	0.24
pH	SU	6.89	7.08	7.13	7.14	7.14	7.12
REDOX POTENTIAL	mV	96.9	13.7	105.9	24.4	-73.9	-54.6
SPECIFIC CONDUCTIVITY	mS/cm	0.979	0.687	1.094	0.628	0.726	0.806
TURBIDITY	NTU	1.96	2.15	3.42	4.64	1.62	3.73
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	107	ND	275	75.5 J	82.1 J	81.7 J
CALCIUM, TOTAL	µg/L	151,000	134,000	107,000	104,000	118,000	127,000
CHLORIDE, TOTAL	mg/L	8.2	10.0	28.9	2.8	3.0	1.7
FLUORIDE, TOTAL	mg/L	0.32	0.34	0.34	0.31	0.34	0.27
SULFATE, TOTAL	mg/L	34.8	26.1	47.4	32.5	30.0	52.5
TOTAL DISSOLVED SOLIDS	mg/L	540	455	426	483 J	415	465
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.084 J	0.042 J	0.21 J	0.18 J	ND	0.068 J
ARSENIC, TOTAL	µg/L	0.91 J	1.2	0.35 J	0.32 J	5.6	2.1
BARIUM, TOTAL	µg/L	139	124	207	195	215	223
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.10 J	ND	0.29 J	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	ND	0.50 J	0.57 J	0.62 J	0.56 J
COBALT, TOTAL	µg/L	ND	1.8 J	6.1	2.1 J	1.3 J	1.3 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	3.1 J
LITHIUM, TOTAL	µg/L	7.4 J	6.0 J	26.8	25.8	30.6	31.6
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	3.1 J	ND	ND	ND	ND
RADIUM [226 + 228]	pCi/L	ND	ND	1.546	1.122	ND	1.034
SELENIUM, TOTAL	µg/L	0.18 J	ND	2.4	0.34 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	0.092 J	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.



**Table 7**  
**Baseline Sampling Event 6 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	1/3/2017	4/5/2017	1/4/2017	1/4/2017	1/4/2017	1/4/2017
DISSOLVED OXYGEN	mg/L	0.50	0.46	0.39	0.37	0.45	0.29
pH	SU	7.24	5.79	7.35	7.30	7.27	7.25
REDOX POTENTIAL	mV	-55.3	215.3	1.7	33.5	47.7	18.9
SPECIFIC CONDUCTIVITY	mS/cm	0.909	0.749	0.784	0.619	0.727	0.792
TURBIDITY	NTU	0.97	3.92	1.99	2.18	3.15	1.72
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	82.2 J	68.8 J	218 J	66.1 J	75.8 J	76.1 J
CALCIUM, TOTAL	µg/L	158,000	122,000	121,000	101,000	121,000	124,000
CHLORIDE, TOTAL	mg/L	7.6	10.0	34.2	3.9	2.6	1.6
FLUORIDE, TOTAL	mg/L	0.29	0.37	0.32	0.32	0.32	0.27
SULFATE, TOTAL	mg/L	26.5	27.6	62.7	37.7	32.5	55.7
TOTAL DISSOLVED SOLIDS	mg/L	533	447	451	339	403	454
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.084 J	0.033 J	0.20 J	0.19 J	ND	0.10 J
ARSENIC, TOTAL	µg/L	0.71 J	0.89 J	0.13 J	0.19 J	5.3	1.6
BARIUM, TOTAL	µg/L	152	118	221	192	225	258
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.57 J	0.32 J	0.47 J	0.42 J	0.43 J	0.55 J
COBALT, TOTAL	µg/L	ND	1.9 J	3.8 J	1.6 J	1.6 J	2.2 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	ND	8.7 J	29.8	26.7	32.0	32.1
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	2.2 J	4.8 J	3.4 J	1.7 J	0.68 J	1.1 J
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.30 J	ND	2.7	0.37 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 8**  
**Baseline Sampling Event 7 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	3/8/2017	6/5/2017	3/9/2017	3/10/2017	3/10/2017	3/10/2017
DISSOLVED OXYGEN	mg/L	0.44	0.69	0.34	0.49	0.17	0.34
pH	SU	7.25	7.06	7.02	6.93	7.00	7.02
REDOX POTENTIAL	mV	-16.2	7.0	52.3	107.1	110.7	67.1
SPECIFIC CONDUCTIVITY	mS/cm	0.827	0.747	0.937	0.591	0.688	0.776
TURBIDITY	NTU	0.70	3.94	0.89	1.63	4.08	3.67
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	84.6 J	55.3 J	468	ND	ND	105
CALCIUM, TOTAL	µg/L	162,000	113,000	144,000	109,000	127,000	148,000
CHLORIDE, TOTAL	mg/L	9.7	10.5	71.9	3.8	2.7	1.6
FLUORIDE, TOTAL	mg/L	0.30	0.33	0.33	0.37	0.36	0.32
SULFATE, TOTAL	mg/L	27.6	25.0	52.3	38.0	33.2	60.9
TOTAL DISSOLVED SOLIDS	mg/L	532	426	570	379	430	493
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.076 J	0.039 J	0.19 J	0.17 J	0.062 J	0.12 J
ARSENIC, TOTAL	µg/L	0.91 J	0.64 J	0.51 J	0.46 J	6.0	2.3
BARIUM, TOTAL	µg/L	151	180	252	196	222	328
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.12 J	ND	0.27 J	0.031 J	ND	ND
CHROMIUM, TOTAL	µg/L	ND	0.12 J	1.3	1.5	1.6	ND
COBALT, TOTAL	µg/L	ND	2.0 J	3.8 J	1.5 J	ND	1.9 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	4.4 J	ND	29.1	25.4	30.5	36.2
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	1.4 J	2.4 J	2.5 J	3.0 J	1.8 J	2.4 J
RADIUM [226 + 228]	pCi/L	ND	1.421	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.37 J	0.095 J	3.3	0.56 J	ND	0.13 J
THALLIUM, TOTAL	µg/L	ND	ND	0.055 J	0.037 J	0.24 J	0.059 J

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 9**  
**Baseline Sampling Event 8 Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	6/5/2017	6/26/2017	6/6/2017	6/6/2017	6/6/2017	6/6/2017
DISSOLVED OXYGEN	mg/L	0.90	0.57	0.67	0.68	0.46	0.61
pH	SU	6.89	6.77	6.63	6.40	6.71	6.41
REDOX POTENTIAL	mV	24.9	11.7	37.1	54.1	-15.7	44.7
SPECIFIC CONDUCTIVITY	mS/cm	0.875	0.758	0.889	0.617	0.656	0.758
TURBIDITY	NTU	2.63	1.37	4.93	1.42	4.92	5.16
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	65.3 J	64.6 J	696	56.0 J	67.7 J	70.8 J
CALCIUM, TOTAL	µg/L	140,000	121,000	128,000	99,600	105,000	121,000
CHLORIDE, TOTAL	mg/L	16.8	10.2	52.3	1.8	2.4	1.7
FLUORIDE, TOTAL	mg/L	0.38	0.34	0.30	0.28	0.32	0.26
SULFATE, TOTAL	mg/L	23.1	23.8	123	27.4	31.1	52.9
TOTAL DISSOLVED SOLIDS	mg/L	409	436	585	381	408	466
<b>APPENDIX IV</b>							
ANTIMONY, TOTAL	µg/L	0.093 J	0.055 J	0.17 J	0.20 J	0.050 J	0.10 J
ARSENIC, TOTAL	µg/L	0.73 J	0.41 J	0.44 J	0.38 J	4.6	2.0
BARIUM, TOTAL	µg/L	146	152	249	207	214	259
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	0.10 J	ND	0.26 J	0.041 J	ND	ND
CHROMIUM, TOTAL	µg/L	0.18 J	ND	0.24 J	0.12 J	0.15 J	ND
COBALT, TOTAL	µg/L	ND	1.2 J	2.2 J	0.91 J	1.9 J	1.3 J
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	ND	9.5 J	ND	ND	ND	ND
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	0.053 J	ND
MOLYBDENUM, TOTAL	µg/L	2.5 J	3.1 J	2.6 J	3.0 J	2.6 J	3.4 J
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	0.18 J	0.22 J	1.5	0.22 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	0.057 J	0.087 J	ND	ND

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
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.
4. Radium (226 + 228) is reported as the sum of the Radium 226 and the Radium 228 activity concentrations unless the sum of the Radium 226 and Radium 228 Minimum Detectable Concentrations (MDC) is higher in which case it is displayed as ND.

**Table 10**  
**November 2017 Detection Monitoring Results**  
**SCL4A - Utility Waste Landfill Cell 4A**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS			
		BMW-1S	BMW-3S	UG-3	TMW-1	TMW-2	TMW-3
<b>FIELD PARAMETERS</b>							
DATE	NA	11/13/2017	11/13/2017	11/15/2017	11/15/2017	11/15/2017	11/15/2017
DISSOLVED OXYGEN	mg/L	0.51	0.71	0.73	1.15	0.87	0.72
pH	SU	6.95	7.08	7.20	7.13	7.21	7.28
REDOX POTENTIAL	mV	-14.6	-36.1	164.7	134.1	82.2	19.7
SPECIFIC CONDUCTIVITY	mS/cm	0.891	0.744	0.929	0.590	0.695	0.836
TURBIDITY	NTU	2.51	3.02	4.44	2.81	3.24	3.97
<b>APPENDIX III</b>							
BORON, TOTAL	µg/L	118	104	293	71.1 J	87.8 J	89.9 J
CALCIUM, TOTAL	µg/L	156,000	128,000	126,000	92,200	117,000	137,000
CHLORIDE, TOTAL	mg/L	7.7	10.5	70.0	2.9	3.3	1.7
FLUORIDE, TOTAL	mg/L	0.30	0.34	0.36	0.37	0.38	0.30
SULFATE, TOTAL	mg/L	41.4	28.2	45.6	39.8	31.4	59.0
TOTAL DISSOLVED SOLIDS	mg/L	526	446	521	323	411	472

**NOTES**

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, mV - millivolts, mS/cm - millisiemens per centimeter, and NTU - nephelometric turbidity unit.
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.

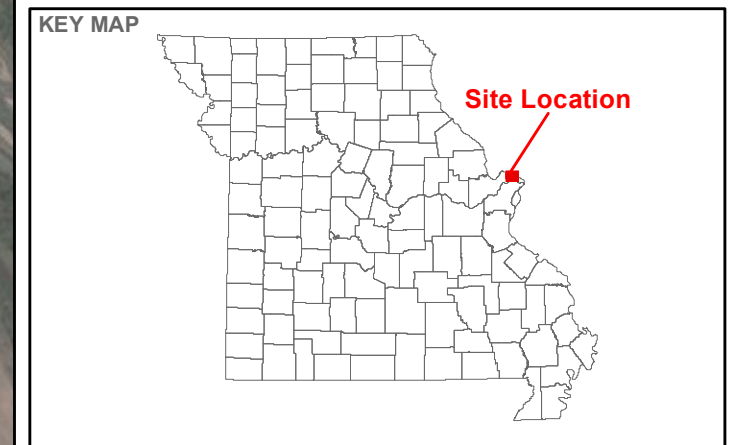
Prepared By: JSI  
Checked By: RJF  
Reviewed By: MNH

# FIGURES



**LEGEND**

- Sioux Energy Center Property Boundary
- Utility Waste Landfill (UWL)**
- SCL4A - Landfill Cell 4A
- Water Recycle Pond
- UWL Final Perimeter Fence
- Ground/Surface Elevation Measurement**
- SCL4A Monitoring Well
- Background Monitoring Well
- Groundwater Elevation Piezometer



**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GOLDER GROUNDWATER MONITORING WELLS (BMW-1S, BMW-2S, BMW-3S, TMW-1, TMW-2 AND TMW-3) SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
- 3.) UWL BOUNDARIES, DESIGNATIONS AND STATE MONITORING WELL LOCATIONS (UG-3) BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).

**REFERENCES**

- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
- 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.
- 3.) AMEREN MISSOURI DRAWING SX-8420-X-182001.
- 4.) GOOGLE EARTH®.



CLIENT  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER



PROJECT  
 GROUNDWATER MONITORING PROGRAM

TITLE  
**SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS**

CONSULTANT	YYYY-MM-DD	2017-08-29
	PREPARED	JSI
	DESIGN	JSI
	REVIEW	JS
	APPROVED	MNH

PROJECT No. 153-1406      PHASE 0003D      Rev. 0      FIGURE 1

Path: G:\Projects\153-1406 - Amrenen GW Monitoring Program - M03Phase 0003 - Sioux Energy\800 - FIGURES\DRAWINGS\PRODUCTION\SCAL4A\Figure 2 - SCL4A - Aerial Map (Rev 1.0).mxd



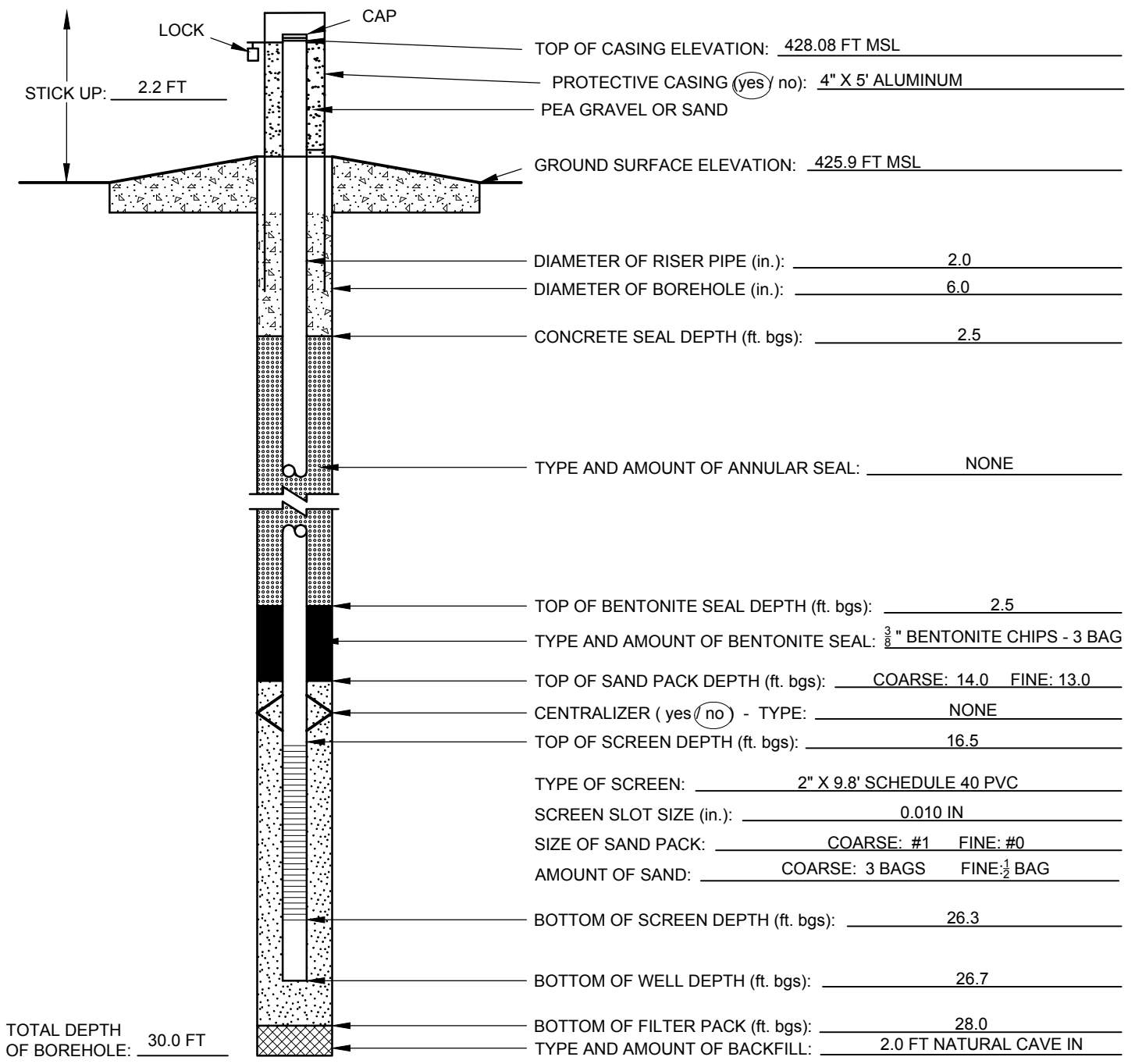
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 11x

# **APPENDIX A – CCR MONITORING WELL CONSTRUCTION DIAGRAMS**



# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG TMW-1

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003D	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: TMW-1	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 425.9 FT MSL	
GEOLOGIST: J. INGRAM	NORTHING: 1117385.1	EASTING: 880121.2	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 10.87 FT BTOC	COMPLETION DATE: 4/5/2016	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 50 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON APRIL 29, 2016.  
 FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

CHECKED BY: J. INGRAM  
 DATE CHECKED: 6/2/2016

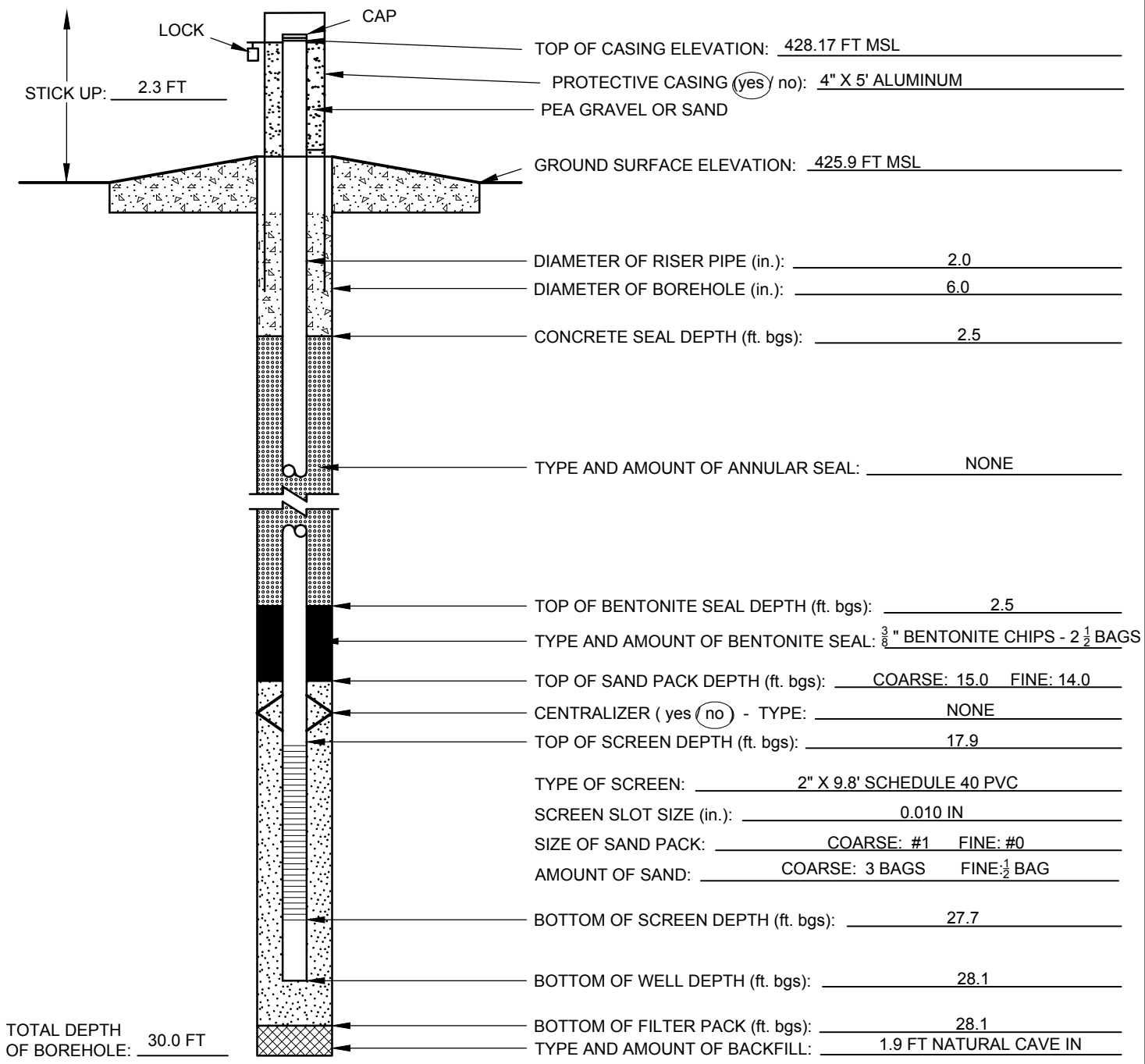
PREPARED BY: J. SUOZZI





# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG TMW-2

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003D	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: TMW-2	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 425.9 FT MSL	
GEOLOGIST: J. INGRAM	NORTHING: 1117320.7	EASTING: 880442.9	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 11.00 FT BTOC	COMPLETION DATE: 4/5/2016	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



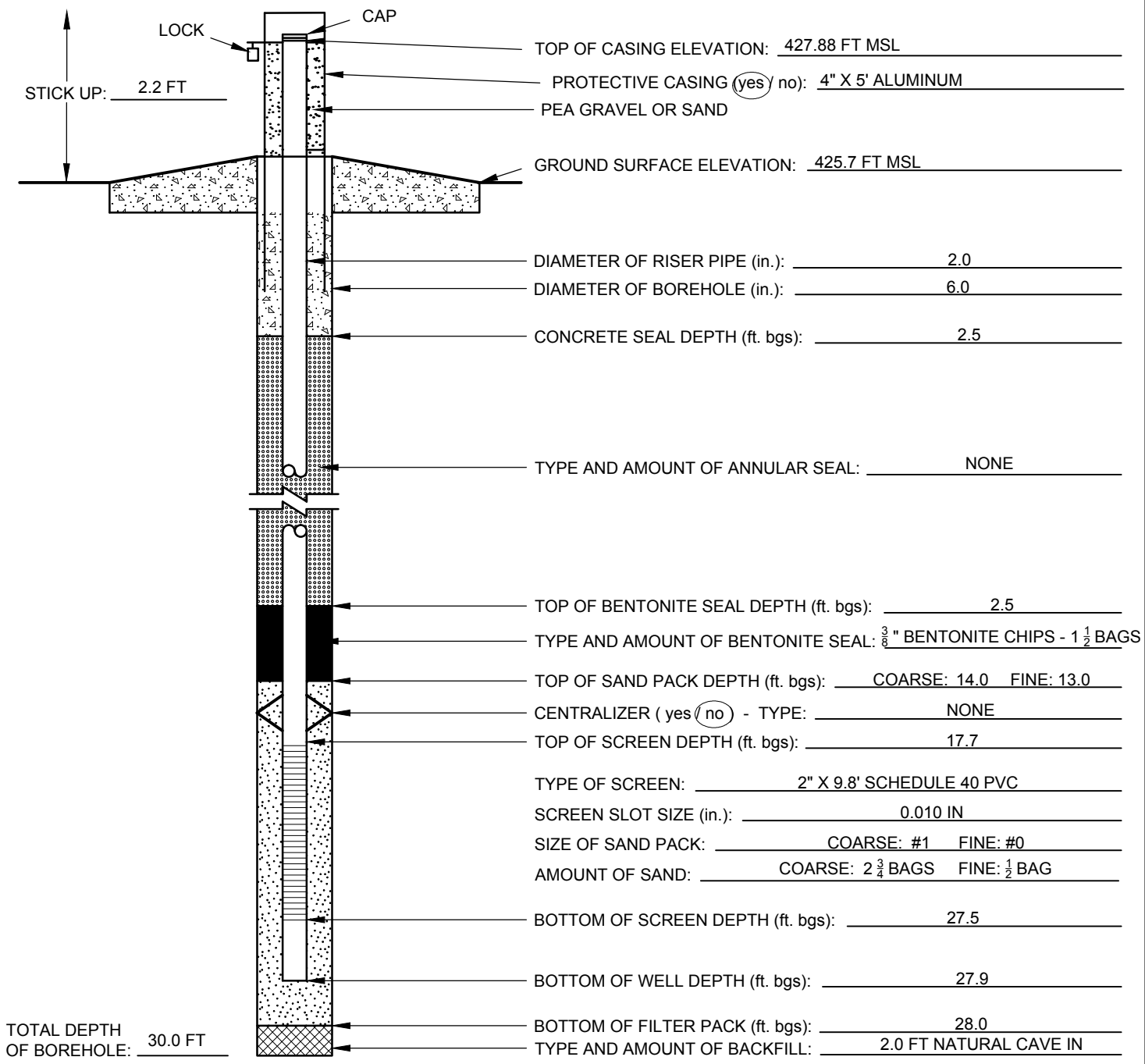
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 50 GALLONS OF H<sub>2</sub>O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON APRIL 29, 2016.  
 FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

CHECKED BY: J. INGRAM  
 DATE CHECKED: 6/2/2016  
 PREPARED BY: J. SUOZZI



# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG TMW-3

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003D	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: TMW-3	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 425.7 FT MSL	
GEOLOGIST: J. INGRAM	NORTHING: 1117259.2	EASTING: 880762.4	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 10.69 FT BTOC	COMPLETION DATE: 4/5/2016	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



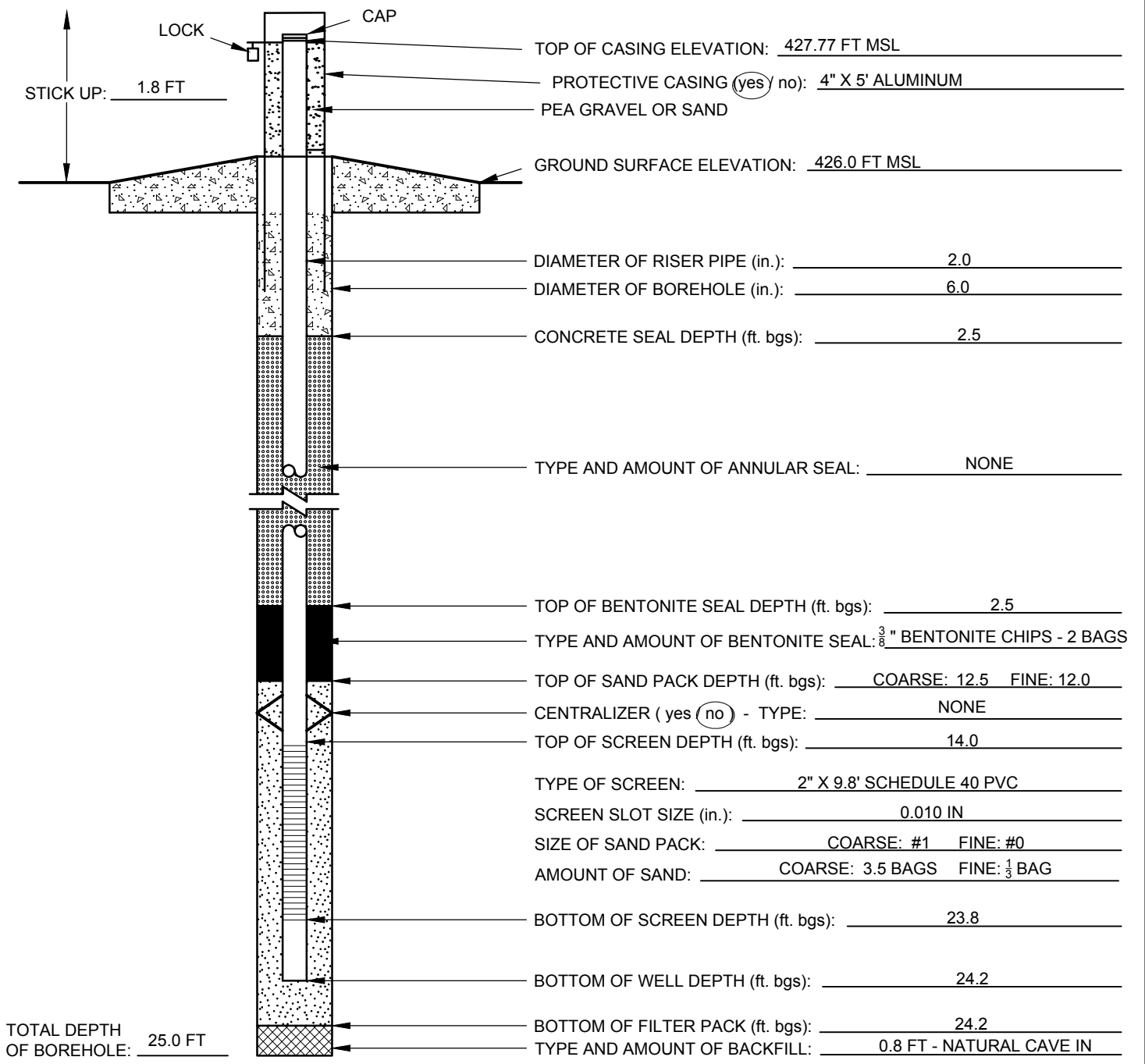
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 40 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON APRIL 29, 2016.  
 FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

CHECKED BY: J. INGRAM  
 DATE CHECKED: 6/2/2016  
 PREPARED BY: J. SUOZZI



# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG BMW-1S

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003B	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: BMW-1S	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 426.0 FT MSL	
GEOLOGIST: J. INGRAM	NORTHING: 1121709.2	EASTING: 876755.6	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 7.35 FT BTOC	COMPLETION DATE: 12/8/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



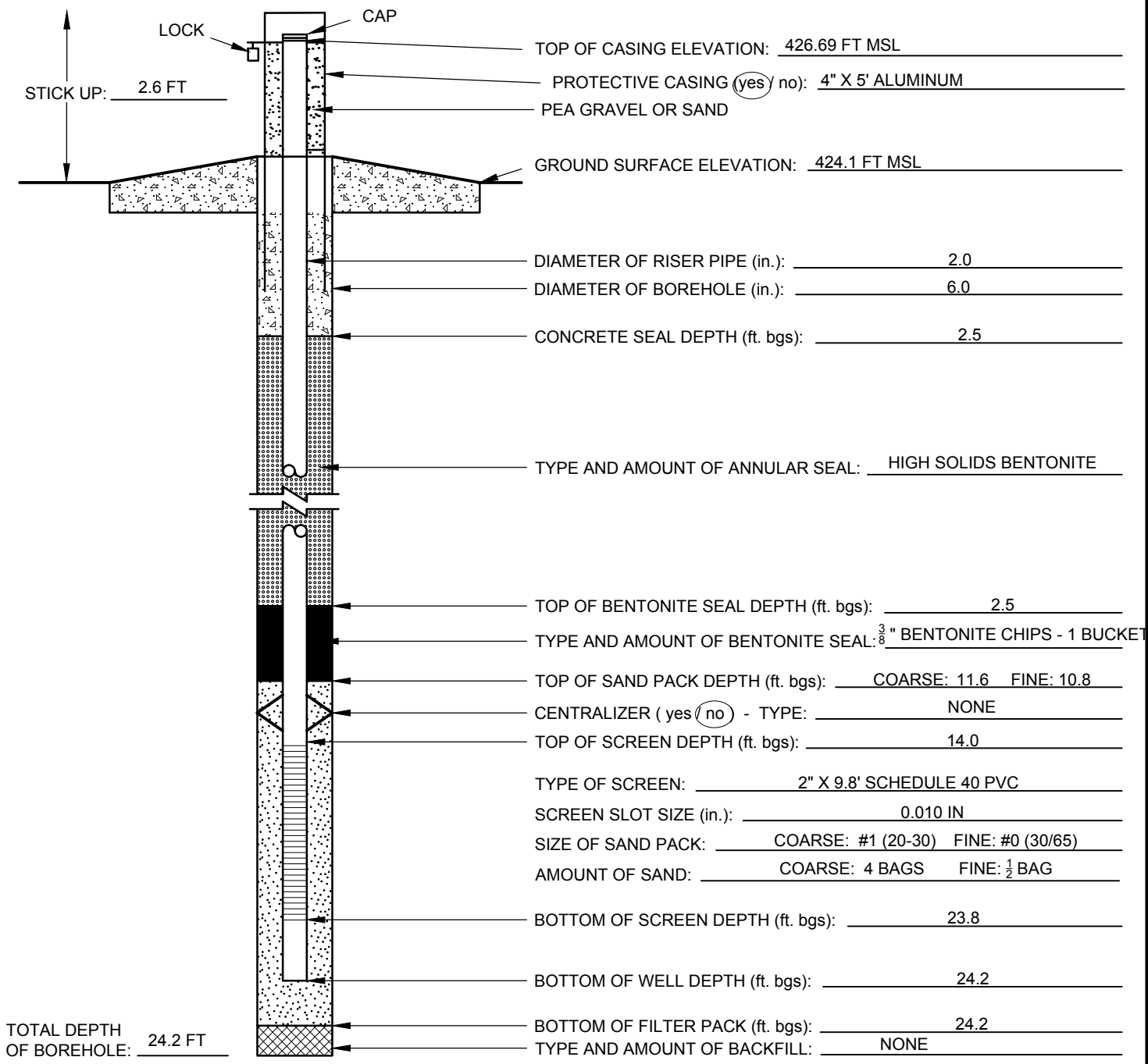
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 50 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 14, 2016.  
 FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

CHECKED BY: J. INGRAM  
 DATE CHECKED: 4/20/2016  
 PREPARED BY: J. SUOZZI



# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG BMW-3S

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003B	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: BMW-3S	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 424.1 FT MSL	
GEOLOGIST: J. INGRAM/M. GORE	NORTHING: 1121792.9	EASTING: 875809.5	
DRILLER: M. RODRIGUES	STATIC WATER LEVEL: 8.65 FT BTOC	COMPLETION DATE: 11/8/2016	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 50 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON DECEMBER 8, 2016.  
 FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

CHECKED BY: J. INGRAM  
 DATE CHECKED: 8/3/2017  
 PREPARED BY: J. SUOZZI

# **APPENDIX B – LABORATORY ANALYTICAL DATA**

January 29, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60261378

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on March 19, 2016. 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.

REV-1, 1/29/18: Radium pulled in for S-BMW-1S

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

---

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60215292010	S-BMW-1S	Water	03/16/16 09:03	03/19/16 05:55

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60215292010	S-BMW-1S	EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

**Sample: S-BMW-1S**      **Lab ID: 60215292010**      Collected: 03/16/16 09:03      Received: 03/19/16 05:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>141</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 15:50	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 15:50	7440-41-7	
Boron	<b>78.1J</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 15:50	7440-42-8	
Calcium	<b>150000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 15:50	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 15:50	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 15:50	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 15:50	7439-93-2	
Molybdenum	<b>2.1J</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 15:50	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.080J</b>	ug/L	1.0	0.058	1	03/22/16 13:30	03/23/16 17:55	7440-36-0	B
Arsenic	<b>0.99J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 17:55	7440-38-2	
Cadmium	<b>0.11J</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 17:55	7440-43-9	B
Chromium	<b>0.40J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 17:55	7440-47-3	
Selenium	<b>0.74J</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 17:55	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 17:55	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	04/01/16 10:45	04/01/16 15:27	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>533</b>	mg/L	5.0	5.0	1		03/22/16 10:33		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.6</b>	Std. Units	0.10	0.10	1		03/22/16 16:15		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.0</b>	mg/L	1.0	0.50	1		03/22/16 03:25	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.073	1		03/22/16 03:25	16984-48-8	
Sulfate	<b>27.8</b>	mg/L	2.0	0.50	2		03/22/16 14:26	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 424740 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60215292010

METHOD BLANK: 1734330 Matrix: Water  
 Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	04/01/16 14:54	

LABORATORY CONTROL SAMPLE: 1734331

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1734332 1734333

Parameter	Units	60215292004		1734333		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Mercury	ug/L	<0.039	5	5	5.0	5.0	100	100	75-125	0	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 423334

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60215292010

METHOD BLANK: 1728583

Matrix: Water

Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	03/23/16 15:10	
Beryllium	ug/L	<0.26	1.0	0.26	03/23/16 15:10	
Boron	ug/L	<50.0	100	50.0	03/23/16 15:10	
Calcium	ug/L	38.0J	100	8.1	03/24/16 10:43	
Cobalt	ug/L	<0.72	5.0	0.72	03/23/16 15:10	
Lead	ug/L	<2.5	5.0	2.5	03/23/16 15:10	
Lithium	ug/L	<4.9	10.0	4.9	03/23/16 15:10	
Molybdenum	ug/L	<0.52	20.0	0.52	03/23/16 15:10	

LABORATORY CONTROL SAMPLE: 1728584

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1030	103	85-115	
Beryllium	ug/L	1000	1010	101	85-115	
Boron	ug/L	1000	1040	104	85-115	
Calcium	ug/L	10000	10100	101	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1010	101	85-115	
Lithium	ug/L	1000	980	98	85-115	
Molybdenum	ug/L	1000	1080	108	85-115	

MATRIX SPIKE SAMPLE: 1728585

Parameter	Units	60215292001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	148	1000	1170	102	70-130	
Beryllium	ug/L	<0.26	1000	997	100	70-130	
Boron	ug/L	1940	1000	2890	95	70-130	
Calcium	ug/L	88600	10000	94700	61	70-130 M1	
Cobalt	ug/L	2.8J	1000	1000	100	70-130	
Lead	ug/L	<2.5	1000	1010	101	70-130	
Lithium	ug/L	16.9	1000	1020	100	70-130	
Molybdenum	ug/L	72.0	1000	1140	107	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1728586		1728587		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60215292004 Result	MS Spike Conc.	MSD Spike Conc.									
Barium	ug/L	226	1000	1000	1260	1250	103	102	70-130	1	20		
Beryllium	ug/L	<0.26	1000	1000	1010	998	101	100	70-130	1	20		
Boron	ug/L	203	1000	1000	1250	1220	105	102	70-130	2	20		
Calcium	ug/L	152000	10000	10000	157000	157000	54	54	70-130	0	20	M1	
Cobalt	ug/L	0.78J	1000	1000	1020	995	101	99	70-130	2	20		
Lead	ug/L	<2.5	1000	1000	1020	1000	101	100	70-130	1	20		
Lithium	ug/L	21.4	1000	1000	1060	1030	104	101	70-130	3	20		
Molybdenum	ug/L	3.6J	1000	1000	1100	1070	109	107	70-130	2	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 423335 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60215292010

METHOD BLANK: 1728588 Matrix: Water

Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.061J	1.0	0.058	03/23/16 16:49	
Arsenic	ug/L	<0.10	1.0	0.10	03/23/16 16:49	
Cadmium	ug/L	0.032J	0.50	0.029	03/23/16 16:49	
Chromium	ug/L	<0.34	1.0	0.34	03/23/16 16:49	
Selenium	ug/L	<0.18	1.0	0.18	03/23/16 16:49	
Thallium	ug/L	<0.50	1.0	0.50	03/23/16 16:49	

LABORATORY CONTROL SAMPLE: 1728589

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	42.3	106	85-115	
Arsenic	ug/L	40	41.4	103	85-115	
Cadmium	ug/L	40	42.2	105	85-115	
Chromium	ug/L	40	40.7	102	85-115	
Selenium	ug/L	40	44.3	111	85-115	
Thallium	ug/L	40	38.3	96	85-115	

MATRIX SPIKE SAMPLE: 1728590

Parameter	Units	60215292002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.092J	40	40.2	100	70-130	
Arsenic	ug/L	2.1	40	41.2	98	70-130	
Cadmium	ug/L	<0.029	40	37.3	93	70-130	
Chromium	ug/L	<0.34	40	38.7	96	70-130	
Selenium	ug/L	<0.18	40	37.2	93	70-130	
Thallium	ug/L	<0.50	40	37.0	92	70-130	

MATRIX SPIKE SAMPLE: 1728591

Parameter	Units	60215292004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.15J	40	40.8	102	70-130	
Arsenic	ug/L	0.72J	40	39.8	98	70-130	
Cadmium	ug/L	0.095J	40	38.9	97	70-130	
Chromium	ug/L	0.64J	40	39.5	97	70-130	
Selenium	ug/L	6.3	40	44.2	95	70-130	
Thallium	ug/L	<0.50	40	36.6	92	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 423301

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60215292010

METHOD BLANK: 1728448

Matrix: Water

Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/22/16 10:28	

LABORATORY CONTROL SAMPLE: 1728449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	980	98	80-120	

SAMPLE DUPLICATE: 1728450

Parameter	Units	60215252009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3580	3560	1	10	

SAMPLE DUPLICATE: 1728486

Parameter	Units	60215284001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	206	212	3	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 423206 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60215292010

SAMPLE DUPLICATE: 1728090

Parameter	Units	60215020001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60261378

QC Batch: 423190 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60215292010

METHOD BLANK: 1728045 Matrix: Water  
Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/21/16 20:13	
Fluoride	mg/L	<0.073	0.20	0.073	03/21/16 20:13	

METHOD BLANK: 1728463 Matrix: Water  
Associated Lab Samples: 60215292010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.25	1.0	0.25	03/21/16 09:37	

LABORATORY CONTROL SAMPLE: 1728046

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	

LABORATORY CONTROL SAMPLE: 1728464

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1728047 1728048

Parameter	Units	60215292004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	2.0	5	5	6.9	6.9	99	99	80-120	0	15		
Fluoride	mg/L	0.12J	2.5	2.5	2.8	2.8	107	107	80-120	0	15		
Sulfate	mg/L	30.0	10	10	39.6	39.7	97	98	80-120	0	15		

MATRIX SPIKE SAMPLE: 1728049

Parameter	Units	60215292011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	85.8	100	189	103	80-120	
Fluoride	mg/L	<0.073	2.5	2.8	110	80-120	

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

**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

MATRIX SPIKE SAMPLE:		1728049					
Parameter	Units	60215292011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	1170	500	1660	97	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.

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.328 ± 0.306 (0.403)</b> C:NA T:93%	pCi/L	04/07/16 21:19	13982-63-3	
Radium-228	EPA 904.0	<b>-0.0581 ± 0.293 (0.696)</b> C:83% T:87%	pCi/L	04/08/16 12:40	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 214973

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60215292010

METHOD BLANK: 1050675

Matrix: Water

Associated Lab Samples: 60215292010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.313 ± 0.431 (0.923) C:83% T:80%	pCi/L	04/08/16 14:11	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 214972

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples:

METHOD BLANK: 1050674

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.436 ± 0.387 (0.788) C:78% T:88%	pCi/L	04/08/16 12:56	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

QC Batch: 214146

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60215292010

METHOD BLANK: 1046813

Matrix: Water

Associated Lab Samples: 60215292010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.101 ± 0.281 (0.545) C:NA T:104%	pCi/L	04/07/16 20:45	

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

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60261378

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60215292010	S-BMW-1S	EPA 200.7	423334	EPA 200.7	423389
60215292010	S-BMW-1S	EPA 200.8	423335	EPA 200.8	423390
60215292010	S-BMW-1S	EPA 7470	424740	EPA 7470	424780
60215292010	S-BMW-1S	EPA 903.1	214146		
60215292010	S-BMW-1S	EPA 904.0	214973		
60215292010	S-BMW-1S	SM 2540C	423301		
60215292010	S-BMW-1S	SM 4500-H+B	423206		
60215292010	S-BMW-1S	EPA 300.0	423190		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60215292



Client Name: Goldes

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: CF +1.0 T-239 / CF 0.0 T-262 Type of Ice: Wet <sup>and</sup> Blue None  Samples received on ice, cooling process has begun.

Cooler Temperature: 12.9, 12.4, 2.0, 14.3

Temperature should be above freezing to 6°C

Date and initials of person examining contents: BB 3/19/16

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.	- Radium metals containers not
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.	shipped with ice, temp OK
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.	for those three coolers.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5.	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6.	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.	
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.	
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.	
Includes date/time/ID/analyses	<u>Y</u> Matrix: <u>WT</u>	15.	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	16.	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	17.	
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	18.	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Pace Trip Blank lot # (if purchased):			
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A		
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A		

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jenni Church Date: 3/21/16



**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:		<b>Section B</b> Report To: Mark Haddock (mhaddock@golder.com)		<b>Section C</b> Invoice Information:	
Company: Golder Associates	Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Copy To: Jeffrey Ingram	Project Name: Ameren Sioux Energy Center - Fly Ash	Attention:	Company Name:
Email To: mhaddock@golder.com	Phone: 636-724-9191	Purchase Order No.:	Project Number: 153-1406.00038	Address:	Reference:
Fax: 636-724-9323	Requested Due Date/AT: Standard	Project Name: Ameren Sioux Energy Center - Fly Ash	Project Number: 153-1406.00038	Face Quote Manager: Jamie Church	Face Project Manager: Jamie Church
Requested Due Date/AT: Standard		Requested Analysis Filtered (Y/N)		Requested Analysis Filtered (Y/N)	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATERIAL CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SLURRY SL SOIL/SOLID OIL OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives		Analysis Test	Metals*	Chloride/Fluoride/Sulfate	TDS	pH	Radium 226 & 228	Residual Chlorine (Y/N)	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)		
					COMPOSITE START	COMPOSITE END/GRAB			H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>												HCl	NaOH
1	S-LMW-DUP-2		WT G	G	3/17/16	3/17/16	6	1	5	5	1	1	1	1	4								
2	S-LMW-FB-1		WT G	G	3/17/16	0845	3/17/16	6	1	5	1	1	1	1	4								
3	S-LMW-FB-2		WT G	G	3/17/16	1237	3/17/16	6	1	5	1	1	1	1	4								
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

SAMPLER NAME AND SIGNATURE		DATE		TIME		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS	
PRINT Name of SAMPLER: John Swezi		3/18/16		12:11		Pace		3/18/16		12:11		Y	
SIGNATURE of SAMPLER: <i>John Swezi</i>		3/18/16		12:11		Pace		3/18/16		12:11		Y	
DATE signed (MM/DD/YY): 03/18/16		3/18/16		12:11		Pace		3/18/16		12:11		Y	

January 04, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261458

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on May 13, 2016. 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,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

---

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60219075001	S-TMW-1	Water	05/11/16 08:45	05/13/16 03:30
60219075002	S-TMW-2	Water	05/11/16 09:56	05/13/16 03:30
60219075003	S-TMW-3	Water	05/11/16 10:58	05/13/16 03:30
60219075006	S-UG-3	Water	05/11/16 12:13	05/13/16 03:30
60219075013	S-TMW-1 MS	Water	05/11/16 08:45	05/13/16 03:30
60219075014	S-TMW-1 MSD	Water	05/11/16 08:45	05/13/16 03:30
60219075011	S-UWL-DUP-1	Water	05/11/16 08:00	05/13/16 03:30
60219075012	S-UWL-FB-1	Water	05/11/16 12:25	05/13/16 03:30
60219086010	S-BMW-1S	Water	05/09/16 10:17	05/13/16 03:30

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60219075001	S-TMW-1	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60219075002	S-TMW-2	EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
60219075003	S-TMW-3	SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60219075006	S-UG-3	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60219075013	S-TMW-1 MS	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JMC1	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
60219075014	S-TMW-1 MSD	EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
60219075011	S-UWL-DUP-1	EPA 200.7	SMW	8	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JMC1	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60219075012	S-UWL-FB-1	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JMC1	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60219086010	S-BMW-1S	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	1	PASI-K
		EPA 300.0	OL	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-1**      **Lab ID: 60219075001**      Collected: 05/11/16 08:45      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>192</b>	ug/L	10.0	0.58	1	05/16/16 15:30	05/19/16 15:41	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:30	05/19/16 15:41	7440-41-7	
Boron	<b>65.4J</b>	ug/L	100	50.0	1	05/16/16 15:30	05/19/16 15:41	7440-42-8	
Calcium	<b>103000</b>	ug/L	100	8.1	1	05/16/16 15:30	05/19/16 15:41	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:30	05/19/16 15:41	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:30	05/19/16 15:41	7439-92-1	
Lithium	<b>24.8</b>	ug/L	10.0	4.9	1	05/16/16 15:30	05/19/16 15:41	7439-93-2	
Molybdenum	<b>4.1J</b>	ug/L	20.0	0.52	1	05/16/16 15:30	05/19/16 15:41	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.13J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 13:47	7440-36-0	
Arsenic	<b>0.34J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 13:47	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 13:47	7440-43-9	
Chromium	<b>0.74J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 13:47	7440-47-3	
Selenium	<b>0.28J</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 13:47	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 13:47	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 14:47	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>368</b>	mg/L	5.0	5.0	1		05/17/16 10:08		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.8</b>	mg/L	1.0	0.50	1		06/03/16 15:02	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.073	1		06/03/16 15:02	16984-48-8	
Sulfate	<b>32.6</b>	mg/L	5.0	1.2	5		06/04/16 11:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-2**      **Lab ID: 60219075002**      Collected: 05/11/16 09:56      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>240</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:21	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:21	7440-41-7	
Boron	<b>107</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:21	7440-42-8	
Calcium	<b>123000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:21	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:21	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:21	7439-92-1	
Lithium	<b>29.9</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:21	7439-93-2	
Molybdenum	<b>6.3J</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:21	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.12J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 12:42	7440-36-0	
Arsenic	<b>2.7</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:42	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:42	7440-43-9	
Chromium	<b>0.69J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:42	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:42	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:42	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 14:53	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>441</b>	mg/L	5.0	5.0	1		05/17/16 10:09		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.9</b>	mg/L	1.0	0.50	1		06/03/16 16:17	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.073	1		06/03/16 16:17	16984-48-8	
Sulfate	<b>35.5</b>	mg/L	5.0	1.2	5		06/04/16 11:55	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-3**      **Lab ID: 60219075003**      Collected: 05/11/16 10:58      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>181</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:23	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:23	7440-41-7	
Boron	<b>116</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:23	7440-42-8	
Calcium	<b>111000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:23	7440-70-2	
Cobalt	<b>0.75J</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:23	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:23	7439-92-1	
Lithium	<b>33.9</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:23	7439-93-2	
Molybdenum	<b>7.4J</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:23	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.10J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 12:46	7440-36-0	
Arsenic	<b>2.8</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:46	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:46	7440-43-9	
Chromium	<b>0.71J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:46	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:46	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:46	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 14:55	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>484</b>	mg/L	5.0	5.0	1		05/17/16 10:09		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.1</b>	mg/L	1.0	0.50	1		06/03/16 16:46	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.073	1		06/03/16 16:46	16984-48-8	
Sulfate	<b>57.0</b>	mg/L	5.0	1.2	5		06/04/16 12:55	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-UG-3**      **Lab ID: 60219075006**      Collected: 05/11/16 12:13      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>214</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:32	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:32	7440-41-7	
Boron	<b>476</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:32	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:32	7440-70-2	
Cobalt	<b>1.4J</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:32	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:32	7439-92-1	
Lithium	<b>29.2</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:32	7439-93-2	
Molybdenum	<b>2.5J</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:32	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.14J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 12:59	7440-36-0	
Arsenic	<b>0.40J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:59	7440-38-2	
Cadmium	<b>0.16J</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:59	7440-43-9	
Chromium	<b>0.36J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:59	7440-47-3	
Selenium	<b>2.1</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:59	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:59	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 15:02	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>515</b>	mg/L	5.0	5.0	1		05/18/16 17:11		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>38.2</b>	mg/L	5.0	2.5	5		06/04/16 13:39	16887-00-6	
Fluoride	<b>0.35</b>	mg/L	0.20	0.073	1		06/03/16 17:16	16984-48-8	
Sulfate	<b>77.3</b>	mg/L	5.0	1.2	5		06/04/16 13:39	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-UWL-DUP-1**      **Lab ID: 60219075011**      Collected: 05/11/16 08:00      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>234</b>	ug/L	10.0	0.58	1	05/16/16 15:30	05/19/16 15:52	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:30	05/19/16 15:52	7440-41-7	
Boron	<b>78.8J</b>	ug/L	100	50.0	1	05/16/16 15:30	05/19/16 15:52	7440-42-8	
Calcium	<b>114000</b>	ug/L	100	8.1	1	05/16/16 15:30	05/19/16 15:52	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:30	05/19/16 15:52	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:30	05/19/16 15:52	7439-92-1	
Lithium	<b>28.4</b>	ug/L	10.0	4.9	1	05/16/16 15:30	05/19/16 15:52	7439-93-2	
Molybdenum	<b>5.7J</b>	ug/L	20.0	0.52	1	05/16/16 15:30	05/19/16 15:52	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.12J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 14:00	7440-36-0	
Arsenic	<b>2.7</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 14:00	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 14:00	7440-43-9	
Chromium	<b>0.55J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 14:00	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 14:00	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 14:00	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 15:18	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>449</b>	mg/L	5.0	5.0	1		05/18/16 17:11		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.6</b>	mg/L	1.0	0.50	1		06/03/16 17:31	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.073	1		06/03/16 17:31	16984-48-8	
Sulfate	<b>33.8</b>	mg/L	5.0	1.2	5		06/07/16 23:26	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample:** S-UWL-FB-1      **Lab ID:** 60219075012      Collected: 05/11/16 12:25      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<0.58	ug/L	10.0	0.58	1	05/16/16 15:30	05/19/16 15:55	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	05/16/16 15:30	05/19/16 15:55	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	05/16/16 15:30	05/19/16 15:55	7440-42-8	
Calcium	22.1J	ug/L	100	8.1	1	05/16/16 15:30	05/19/16 15:55	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	05/16/16 15:30	05/19/16 15:55	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	05/16/16 15:30	05/19/16 15:55	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	05/16/16 15:30	05/19/16 15:55	7439-93-2	
Molybdenum	<0.52	ug/L	20.0	0.52	1	05/16/16 15:30	05/19/16 15:55	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.058	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 14:05	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 14:05	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 14:05	7440-43-9	
Chromium	0.55J	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 14:05	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 14:05	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 14:05	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.039	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 15:20	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		05/18/16 17:11		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.2	Std. Units	0.10	0.10	1		05/16/16 08:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		06/03/16 17:01	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		06/03/16 17:01	16984-48-8	
Sulfate	<0.25	mg/L	1.0	0.25	1		06/03/16 17:01	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-BMW-1S**      **Lab ID: 60219086010**      Collected: 05/09/16 10:17      Received: 05/13/16 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>137</b>	ug/L	10.0	0.58	1	05/16/16 15:30	05/19/16 16:48	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:30	05/19/16 16:48	7440-41-7	
Boron	<b>65.2J</b>	ug/L	100	50.0	1	05/16/16 15:30	05/19/16 16:48	7440-42-8	
Calcium	<b>144000</b>	ug/L	100	8.1	1	05/16/16 15:30	05/19/16 16:48	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:30	05/19/16 16:48	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:30	05/19/16 16:48	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	05/16/16 15:30	05/19/16 16:48	7439-93-2	
Molybdenum	<b>2.3J</b>	ug/L	20.0	0.52	1	05/16/16 15:30	05/19/16 16:48	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.064J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 15:06	7440-36-0	
Arsenic	<b>1.0</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 15:06	7440-38-2	
Cadmium	<b>0.097J</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 15:06	7440-43-9	
Chromium	<b>0.44J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 15:06	7440-47-3	
Selenium	<b>0.74J</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 15:06	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 15:06	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	05/19/16 10:00	05/19/16 16:16	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>517</b>	mg/L	5.0	5.0	1		05/16/16 08:44		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.5</b>	mg/L	1.0	0.50	1		05/25/16 21:17	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.073	1		05/25/16 21:17	16984-48-8	
Sulfate	<b>26.2</b>	mg/L	2.0	0.50	2		05/28/16 01:24	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 431065

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012

METHOD BLANK: 1761317

Matrix: Water

Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	05/19/16 14:44	

LABORATORY CONTROL SAMPLE: 1761318

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1761319 1761320

Parameter	Units	60219075001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.039	5	5	5.9	5.7	117	113	75-125	3	20	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 431067 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60219086010

METHOD BLANK: 1761325 Matrix: Water  
 Associated Lab Samples: 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	05/19/16 15:45	

LABORATORY CONTROL SAMPLE: 1761326

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1761327 1761328

Parameter	Units	60219086004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	<0.039		5	5	5.7	5.5	113	110	75-125	3	20			

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430503 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60219075002, 60219075003, 60219075006

METHOD BLANK: 1759373 Matrix: Water

Associated Lab Samples: 60219075002, 60219075003, 60219075006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	05/20/16 09:45	
Beryllium	ug/L	<0.26	1.0	0.26	05/20/16 09:45	
Boron	ug/L	<50.0	100	50.0	05/20/16 09:45	
Calcium	ug/L	11.4J	100	8.1	05/20/16 09:45	
Cobalt	ug/L	<0.72	5.0	0.72	05/20/16 09:45	
Lead	ug/L	<2.5	5.0	2.5	05/20/16 09:45	
Lithium	ug/L	<4.9	10.0	4.9	05/20/16 09:45	
Molybdenum	ug/L	<0.52	20.0	0.52	05/20/16 09:45	

LABORATORY CONTROL SAMPLE: 1759374

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1030	103	85-115	
Beryllium	ug/L	1000	1050	105	85-115	
Boron	ug/L	1000	1010	101	85-115	
Calcium	ug/L	10000	10400	104	85-115	
Cobalt	ug/L	1000	1030	103	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1060	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1759375 1759376

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60219054001 Result	Spike Conc.	Spike Conc.	MS Result						
Barium	ug/L	120	1000	1000	1160	1150	104	103	70-130	1	20
Beryllium	ug/L	<0.26	1000	1000	1050	1040	105	104	70-130	1	20
Boron	ug/L	614	1000	1000	1680	1670	106	105	70-130	1	20
Calcium	ug/L	62700	10000	10000	74600	72700	119	100	70-130	3	20
Cobalt	ug/L	<0.72	1000	1000	1020	1030	102	103	70-130	1	20
Lead	ug/L	3.0J	1000	1000	1020	1030	102	103	70-130	1	20
Lithium	ug/L	14.6	1000	1000	1030	1030	102	102	70-130	0	20
Molybdenum	ug/L	38.3	1000	1000	1110	1120	107	108	70-130	1	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

MATRIX SPIKE SAMPLE: 1759377		60219075003	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Barium	ug/L	181	1000	1240	106	70-130	
Beryllium	ug/L	<0.26	1000	1080	108	70-130	
Boron	ug/L	116	1000	1190	107	70-130	
Calcium	ug/L	111000	10000	121000	98	70-130	
Cobalt	ug/L	0.75J	1000	1030	103	70-130	
Lead	ug/L	<2.5	1000	1030	103	70-130	
Lithium	ug/L	33.9	1000	1070	104	70-130	
Molybdenum	ug/L	7.4J	1000	1090	108	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430504

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60219075001, 60219075011, 60219075012, 60219086010

METHOD BLANK: 1759378

Matrix: Water

Associated Lab Samples: 60219075001, 60219075011, 60219075012, 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	05/19/16 15:37	
Beryllium	ug/L	<0.26	1.0	0.26	05/19/16 15:37	
Boron	ug/L	<50.0	100	50.0	05/19/16 15:37	
Calcium	ug/L	11.5J	100	8.1	05/19/16 15:37	
Cobalt	ug/L	<0.72	5.0	0.72	05/19/16 15:37	
Lead	ug/L	<2.5	5.0	2.5	05/19/16 15:37	
Lithium	ug/L	<4.9	10.0	4.9	05/19/16 15:37	
Molybdenum	ug/L	0.57J	20.0	0.52	05/19/16 15:37	

LABORATORY CONTROL SAMPLE: 1759379

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Beryllium	ug/L	1000	976	98	85-115	
Boron	ug/L	1000	890	89	85-115	
Calcium	ug/L	10000	9540	95	85-115	
Cobalt	ug/L	1000	1000	100	85-115	
Lead	ug/L	1000	976	98	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1759380 1759381

Parameter	Units	60219075001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MSD Result	% Rec	% Rec					
Barium	ug/L	192	1000	1000	1220	1210	102	101	70-130	1	20		
Beryllium	ug/L	<0.26	1000	1000	996	986	100	99	70-130	1	20		
Boron	ug/L	65.4J	1000	1000	981	975	92	91	70-130	1	20		
Calcium	ug/L	103000	10000	10000	114000	111000	112	79	70-130	3	20		
Cobalt	ug/L	<0.72	1000	1000	991	986	99	99	70-130	1	20		
Lead	ug/L	<2.5	1000	1000	960	951	96	95	70-130	1	20		
Lithium	ug/L	24.8	1000	1000	1050	1040	103	102	70-130	1	20		
Molybdenum	ug/L	4.1J	1000	1000	1050	1050	105	105	70-130	0	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Parameter	Units	1759382		1759383		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60219086004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Barium	ug/L	233	1000	1000	1260	1240	102	100	70-130	2	20	
Beryllium	ug/L	<0.26	1000	1000	999	992	100	99	70-130	1	20	
Boron	ug/L	190	1000	1000	1120	1120	93	93	70-130	0	20	
Calcium	ug/L	153000	10000	10000	165000	162000	126	93	70-130	2	20	
Cobalt	ug/L	<0.72	1000	1000	978	969	98	97	70-130	1	20	
Lead	ug/L	<2.5	1000	1000	947	935	95	93	70-130	1	20	
Lithium	ug/L	23.5	1000	1000	1050	1040	103	102	70-130	1	20	
Molybdenum	ug/L	3.9J	1000	1000	1050	1050	105	104	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430505 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60219075002, 60219075003, 60219075006

METHOD BLANK: 1759384 Matrix: Water

Associated Lab Samples: 60219075002, 60219075003, 60219075006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	05/24/16 11:28	
Arsenic	ug/L	<0.10	1.0	0.10	05/24/16 11:28	
Cadmium	ug/L	<0.029	0.50	0.029	05/24/16 11:28	
Chromium	ug/L	<0.34	1.0	0.34	05/24/16 11:28	
Selenium	ug/L	<0.18	1.0	0.18	05/24/16 11:28	
Thallium	ug/L	<0.50	1.0	0.50	05/24/16 11:28	

LABORATORY CONTROL SAMPLE: 1759385

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.2	103	85-115	
Arsenic	ug/L	40	41.2	103	85-115	
Cadmium	ug/L	40	41.1	103	85-115	
Chromium	ug/L	40	40.3	101	85-115	
Selenium	ug/L	40	42.3	106	85-115	
Thallium	ug/L	40	37.4	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1759386 1759387

Parameter	Units	60219054001		60219054007		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.							
Antimony	ug/L	0.11J	40	40	42.3	41.5	105	104	70-130	2	20	
Arsenic	ug/L	0.90J	40	40	43.8	44.0	107	108	70-130	0	20	
Cadmium	ug/L	<0.029	40	40	40.9	40.8	102	102	70-130	0	20	
Chromium	ug/L	0.62J	40	40	41.8	41.1	103	101	70-130	2	20	
Selenium	ug/L	<0.18	40	40	42.3	41.6	106	104	70-130	2	20	
Thallium	ug/L	<0.50	40	40	38.7	38.2	97	95	70-130	1	20	

MATRIX SPIKE SAMPLE: 1759388

Parameter	Units	60219054007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.058	40	41.9	105	70-130	
Arsenic	ug/L	<0.10	40	42.9	107	70-130	
Cadmium	ug/L	<0.029	40	39.7	99	70-130	
Chromium	ug/L	0.58J	40	41.5	102	70-130	
Selenium	ug/L	<0.18	40	41.5	104	70-130	
Thallium	ug/L	<0.50	40	38.0	95	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430506 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60219075001, 60219075011, 60219075012, 60219086010

METHOD BLANK: 1759389 Matrix: Water  
 Associated Lab Samples: 60219075001, 60219075011, 60219075012, 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	05/24/16 13:39	
Arsenic	ug/L	<0.10	1.0	0.10	05/24/16 13:39	
Cadmium	ug/L	<0.029	0.50	0.029	05/24/16 13:39	
Chromium	ug/L	<0.34	1.0	0.34	05/24/16 13:39	
Selenium	ug/L	<0.18	1.0	0.18	05/24/16 13:39	
Thallium	ug/L	<0.50	1.0	0.50	05/24/16 13:39	

LABORATORY CONTROL SAMPLE: 1759390

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.0	103	85-115	
Arsenic	ug/L	40	41.8	104	85-115	
Cadmium	ug/L	40	40.4	101	85-115	
Chromium	ug/L	40	40.2	100	85-115	
Selenium	ug/L	40	42.7	107	85-115	
Thallium	ug/L	40	37.9	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1759391 1759392

Parameter	Units	60219075001		60219075011		60219075012		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.								
Antimony	ug/L	0.13J	40	40	40.2	41.2	100	103	70-130	3	20				
Arsenic	ug/L	0.34J	40	40	42.0	42.6	104	106	70-130	1	20				
Cadmium	ug/L	<0.029	40	40	38.5	39.6	96	99	70-130	3	20				
Chromium	ug/L	0.74J	40	40	40.6	40.9	100	100	70-130	1	20				
Selenium	ug/L	0.28J	40	40	39.8	41.0	99	102	70-130	3	20				
Thallium	ug/L	<0.50	40	40	36.9	37.8	92	94	70-130	3	20				

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1759393 1759394

Parameter	Units	60219086004		60219086010		60219086011		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.								
Antimony	ug/L	0.16J	40	40	40.0	40.2	100	100	70-130	1	20				
Arsenic	ug/L	0.60J	40	40	41.9	42.0	103	103	70-130	0	20				
Cadmium	ug/L	0.035J	40	40	38.8	38.5	97	96	70-130	1	20				
Chromium	ug/L	0.77J	40	40	39.9	40.2	98	99	70-130	1	20				
Selenium	ug/L	2.3	40	40	42.9	42.4	102	100	70-130	1	20				

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Parameter	Units	60219086004		1759393		1759394		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Thallium	ug/L	<0.50	40	40	37.0	37.3	92	93	70-130	1	20			

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430413

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60219086010

METHOD BLANK: 1759175

Matrix: Water

Associated Lab Samples: 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/16/16 08:38	

LABORATORY CONTROL SAMPLE: 1759176

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1150	115	80-120	

SAMPLE DUPLICATE: 1759177

Parameter	Units	60219086004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	626	621	1	10	

SAMPLE DUPLICATE: 1759178

Parameter	Units	60219054001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	321	312	3	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430619

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60219075001, 60219075002, 60219075003

METHOD BLANK: 1759725

Matrix: Water

Associated Lab Samples: 60219075001, 60219075002, 60219075003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/17/16 09:59	

LABORATORY CONTROL SAMPLE: 1759726

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1190	119	80-120	

SAMPLE DUPLICATE: 1759727

Parameter	Units	60218977003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	13800	13500	2	10	

SAMPLE DUPLICATE: 1759728

Parameter	Units	60219075001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	368	400	8	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 431000

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60219075006, 60219075011, 60219075012

METHOD BLANK: 1760993

Matrix: Water

Associated Lab Samples: 60219075006, 60219075011, 60219075012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/18/16 17:10	

LABORATORY CONTROL SAMPLE: 1760994

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1100	110	80-120	

SAMPLE DUPLICATE: 1760995

Parameter	Units	60219311002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4620	4320	7	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 430313 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60219086010

SAMPLE DUPLICATE: 1758395

Parameter	Units	60219086004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.1	0	5	H6

SAMPLE DUPLICATE: 1758396

Parameter	Units	60219054001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 431972	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60219086010	

METHOD BLANK: 1765167 Matrix: Water  
Associated Lab Samples: 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	05/25/16 17:18	
Fluoride	mg/L	<0.073	0.20	0.073	05/25/16 17:18	

LABORATORY CONTROL SAMPLE: 1765168

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.7	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1765169 1765170

Parameter	Units	60219086001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result						
Fluoride	mg/L	0.29	2.5	2.5	2.7	2.8	97	99	80-120	1	15	

MATRIX SPIKE SAMPLE: 1765171

Parameter	Units	60219086004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		2.4	5	6.9	91	80-120
Fluoride	mg/L		0.25	2.5	2.6	93	80-120

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 432357	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60219086010	

METHOD BLANK: 1766806 Matrix: Water  
Associated Lab Samples: 60219086010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.25	1.0	0.25	05/27/16 18:56	

LABORATORY CONTROL SAMPLE: 1766807

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1766808 1766809

Parameter	Units	60219086001		60219086004		60219086004		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Sulfate	mg/L	131	50	50	184	186	106	110	80-120	1	15

MATRIX SPIKE SAMPLE: 1766810

Parameter	Units	60219086004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	33.4	25	59.2	103	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 433108 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012

METHOD BLANK: 1770106 Matrix: Water  
 Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/03/16 14:32	
Fluoride	mg/L	<0.073	0.20	0.073	06/03/16 14:32	
Sulfate	mg/L	<0.25	1.0	0.25	06/03/16 14:32	

LABORATORY CONTROL SAMPLE: 1770107

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1770108 1770109

Parameter	Units	60219075001		60219075002		60219075003		60219075006		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	3.8	5	5	8.6	8.6	95	96	80-120	1	15		
Fluoride	mg/L	0.33	2.5	2.5	2.7	2.7	95	97	80-120	1	15		

MATRIX SPIKE SAMPLE: 1770110

Parameter	Units	60219075002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.9	5	8.7	95	80-120	
Fluoride	mg/L	0.38	2.5	2.8	96	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 433261 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006

METHOD BLANK: 1770808 Matrix: Water  
 Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/04/16 08:59	
Sulfate	mg/L	<0.25	1.0	0.25	06/04/16 08:59	

LABORATORY CONTROL SAMPLE: 1770809

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1770810 1770811

Parameter	Units	60219075001		60219075002		60219075003		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	3.8		28.1	28.0				1	15	
Sulfate	mg/L	32.6	25	58.5	58.0	104	102	80-120	1	15	

MATRIX SPIKE SAMPLE: 1770812

Parameter	Units	60219075002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	3.9		28.0			
Sulfate	mg/L	35.5	25	60.8	101	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 433490

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60219075011

METHOD BLANK: 1771644

Matrix: Water

Associated Lab Samples: 60219075011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.25	1.0	0.25	06/07/16 11:40	

LABORATORY CONTROL SAMPLE: 1771645

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1771646 1771647

Parameter	Units	60217720053		1771646		1771647		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Sulfate	mg/L	ND	5	5	4.7	4.7	95	95	80-120	0	15

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-1**      **Lab ID: 60219075001**      Collected: 05/11/16 08:45      Received: 05/13/16 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.125 ± 0.426 (0.821)</b> <b>C:NA T:100%</b>	pCi/L	06/07/16 10:05	13982-63-3	
Radium-228	EPA 904.0	<b>0.571 ± 0.389 (0.748)</b> <b>C:78% T:88%</b>	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-2**      **Lab ID: 60219075002**      Collected: 05/11/16 09:56      Received: 05/13/16 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.368 ± 0.480 (0.792)</b> C:NA T:91%	pCi/L	06/07/16 10:05	13982-63-3	
Radium-228	EPA 904.0	<b>0.426 ± 0.414 (0.851)</b> C:79% T:75%	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-TMW-3**      **Lab ID: 60219075003**      Collected: 05/11/16 10:58      Received: 05/13/16 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.487 ± 0.456 (0.646)</b> C:NA T:86%	pCi/L	06/07/16 10:49	13982-63-3	
Radium-228	EPA 904.0	<b>-0.139 ± 0.398 (0.957)</b> C:81% T:73%	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-UG-3**      **Lab ID: 60219075006**      Collected: 05/11/16 12:13      Received: 05/13/16 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.343 ± 0.405 (0.637)</b> C:NA T:87%	pCi/L	06/07/16 11:05	13982-63-3	
Radium-228	EPA 904.0	<b>0.756 ± 0.453 (0.845)</b> C:77% T:81%	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Sample: S-TMW-1 MS		Lab ID: 60219075013	Collected: 05/11/16 08:45	Received: 05/13/16 03:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>81.73 %REC ± NA (NA)</b>		pCi/L	06/07/16 11:26	13982-63-3	
		<b>C:NA T:NA</b>					
Radium-228	EPA 904.0	<b>102 %REC +/- NA (NA)</b>		pCi/L	06/07/16 16:25	15262-20-1	
		<b>C:NA T:NA</b>					

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Sample: S-TMW-1 MSD		Lab ID: 60219075014	Collected: 05/11/16 08:45	Received: 05/13/16 03:30	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	99.2 %REC NA (NA) C:NA T:NA	19.29 RPD ±	pCi/L	06/07/16 11:38	13982-63-3	
Radium-228	EPA 904.0	117 %REC (NA) C:NA T:NA	13.7 RPD +/- NA	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.195 ± 0.383 (0.699)</b> C:NA T:88%	pCi/L	06/07/16 11:04	13982-63-3	
Radium-228	EPA 904.0	<b>0.873 ± 0.508 (0.938)</b> C:75% T:71%	pCi/L	06/10/16 12:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.133 ± 0.368 (0.870)</b> <b>C:NA T:92%</b>	pCi/L	06/07/16 11:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.159 ± 0.399 (0.890)</b> <b>C:76% T:74%</b>	pCi/L	06/07/16 16:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

**Sample: S-BMW-1S**      **Lab ID: 60219086010**      Collected: 05/09/16 10:17      Received: 05/13/16 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.312 ± 0.368 (0.579)</b> <b>C:NA T:98%</b>	pCi/L	06/06/16 22:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.188 ± 0.318 (0.692)</b> <b>C:79% T:86%</b>	pCi/L	06/06/16 16:50	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 220635

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60219086010

METHOD BLANK: 1079582

Matrix: Water

Associated Lab Samples: 60219086010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0688 ± 0.348 (0.793) C:80% T:75%	pCi/L	06/06/16 16:48	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 221078

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012, 60219075013, 60219075014

METHOD BLANK: 1081659

Matrix: Water

Associated Lab Samples: 60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012, 60219075013, 60219075014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0644 ± 0.294 (0.598) C:NA T:93%	pCi/L	06/07/16 10:37	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

QC Batch: 220623

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60219086010

METHOD BLANK: 1079570

Matrix: Water

Associated Lab Samples: 60219086010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0639 ± 0.292 (0.471) C:NA T:98%	pCi/L	06/06/16 21:15	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

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QC Batch:	220636	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012, 60219075013, 60219075014		

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METHOD BLANK:	1079584	Matrix:	Water
Associated Lab Samples:	60219075001, 60219075002, 60219075003, 60219075006, 60219075011, 60219075012, 60219075013, 60219075014		

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Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.275 ± 0.372 (0.797) C:78% T:82%	pCi/L	06/07/16 16:25	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60219075001	S-TMW-1	EPA 200.7	430504	EPA 200.7	430595
60219075002	S-TMW-2	EPA 200.7	430503	EPA 200.7	430607
60219075003	S-TMW-3	EPA 200.7	430503	EPA 200.7	430607
60219075006	S-UG-3	EPA 200.7	430503	EPA 200.7	430607
60219075011	S-UWL-DUP-1	EPA 200.7	430504	EPA 200.7	430595
60219075012	S-UWL-FB-1	EPA 200.7	430504	EPA 200.7	430595
60219086010	S-BMW-1S	EPA 200.7	430504	EPA 200.7	430595
60219075001	S-TMW-1	EPA 200.8	430506	EPA 200.8	430597
60219075002	S-TMW-2	EPA 200.8	430505	EPA 200.8	430611
60219075003	S-TMW-3	EPA 200.8	430505	EPA 200.8	430611
60219075006	S-UG-3	EPA 200.8	430505	EPA 200.8	430611
60219075011	S-UWL-DUP-1	EPA 200.8	430506	EPA 200.8	430597
60219075012	S-UWL-FB-1	EPA 200.8	430506	EPA 200.8	430597
60219086010	S-BMW-1S	EPA 200.8	430506	EPA 200.8	430597
60219075001	S-TMW-1	EPA 7470	431065	EPA 7470	431141
60219075002	S-TMW-2	EPA 7470	431065	EPA 7470	431141
60219075003	S-TMW-3	EPA 7470	431065	EPA 7470	431141
60219075006	S-UG-3	EPA 7470	431065	EPA 7470	431141
60219075011	S-UWL-DUP-1	EPA 7470	431065	EPA 7470	431141
60219075012	S-UWL-FB-1	EPA 7470	431065	EPA 7470	431141
60219086010	S-BMW-1S	EPA 7470	431067	EPA 7470	431143
60219075001	S-TMW-1	EPA 903.1	221078		
60219075002	S-TMW-2	EPA 903.1	221078		
60219075003	S-TMW-3	EPA 903.1	221078		
60219075006	S-UG-3	EPA 903.1	221078		
60219075011	S-UWL-DUP-1	EPA 903.1	221078		
60219075012	S-UWL-FB-1	EPA 903.1	221078		
60219086010	S-BMW-1S	EPA 903.1	220623		
60219075013	S-TMW-1 MS	EPA 903.1	221078		
60219075014	S-TMW-1 MSD	EPA 903.1	221078		
60219075001	S-TMW-1	EPA 904.0	220636		
60219075002	S-TMW-2	EPA 904.0	220636		
60219075003	S-TMW-3	EPA 904.0	220636		
60219075006	S-UG-3	EPA 904.0	220636		
60219075011	S-UWL-DUP-1	EPA 904.0	220636		
60219075012	S-UWL-FB-1	EPA 904.0	220636		
60219086010	S-BMW-1S	EPA 904.0	220635		
60219075013	S-TMW-1 MS	EPA 904.0	220636		
60219075014	S-TMW-1 MSD	EPA 904.0	220636		
60219075001	S-TMW-1	SM 2540C	430619		
60219075002	S-TMW-2	SM 2540C	430619		
60219075003	S-TMW-3	SM 2540C	430619		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261458

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60219075006	S-UG-3	SM 2540C	431000		
60219075011	S-UWL-DUP-1	SM 2540C	431000		
60219075012	S-UWL-FB-1	SM 2540C	431000		
60219086010	S-BMW-1S	SM 2540C	430413		
60219075001	S-TMW-1	SM 4500-H+B	430385		
60219075002	S-TMW-2	SM 4500-H+B	430385		
60219075003	S-TMW-3	SM 4500-H+B	430385		
60219075006	S-UG-3	SM 4500-H+B	430385		
60219075011	S-UWL-DUP-1	SM 4500-H+B	430385		
60219075012	S-UWL-FB-1	SM 4500-H+B	430385		
60219086010	S-BMW-1S	SM 4500-H+B	430313		
60219075001	S-TMW-1	EPA 300.0	433108		
60219075001	S-TMW-1	EPA 300.0	433261		
60219075002	S-TMW-2	EPA 300.0	433108		
60219075002	S-TMW-2	EPA 300.0	433261		
60219075003	S-TMW-3	EPA 300.0	433108		
60219075003	S-TMW-3	EPA 300.0	433261		
60219075006	S-UG-3	EPA 300.0	433108		
60219075006	S-UG-3	EPA 300.0	433261		
60219075011	S-UWL-DUP-1	EPA 300.0	433108		
60219075011	S-UWL-DUP-1	EPA 300.0	433490		
60219075012	S-UWL-FB-1	EPA 300.0	433108		
60219086010	S-BMW-1S	EPA 300.0	431972		
60219086010	S-BMW-1S	EPA 300.0	432357		

### REPORT OF LABORATORY ANALYSIS

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# Sample Condition Upon Receipt

WO#: 60219075  
60219075

Client Name: Golder

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: CF +1.0 T-239, 1 (T-262) Type of Ice: Wet Blue  None  Samples received on ice, cooling process has begun. (circle one)

Cooler Temperature: 2.0/11.9/14.1

Date and initials of person examining contents: pvs/13/16

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>p/t</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	11.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Includes date/time/ID/analyses Matrix: <u>WT</u>		15.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	16.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	17.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		18.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	19.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	20. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	21.

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jami Church Date: 5/13/16

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_





### Sample Condition Upon Receipt

WO#: 60219086  
60219086

Client Name: Goldes

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-239 / T-262 Type of Ice: Wet Blue  None  Samples received on ice, cooling process has begun.

Cooler Temperature: 2.6, 13.9, 15.1, 14.8  
Temperature should be above freezing to 6°C

Date and initials of person examining contents: RS 5/13/16

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses	<u>4</u> Matrix: <u>WT</u>	13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_



# CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: Golder Associates	Report To: Mark Haddock (mhaddock@golder.com)	Attention:	Company Name:	REGULATORY AGENCY	
Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Copy To: Jeffrey Ingram	Address:	Address:	<input type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER
Email To: mhaddock@golder.com	Purchase Order No.:	Pace Quote Reference:	Jamie Church	<input type="checkbox"/> UST	<input type="checkbox"/> RCRA
Phone: 636-724-9191	Project Name: Ameren Stou Energy Center - Fly Ash	Pace Project Manager:	MO	<input type="checkbox"/> OTHER	
Requested Due Date/TAT: Standard	Project Number: 153-1406.0003B	Pace Profile #:	9285	Site Location	STATE: MO

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW WASTE WATER PRODUCT P SOIL/SOLID SL OIL OL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	UNPRESERVED	PRESERVATIVES							ANALYSIS TEST	METALS*	CHLORIDE/FLUORIDE/SULFATE	TDS	PH	Radium 226 & 228	RESIDUAL CHLORINE (Y/N)	PACE PROJECT NO./LAB I.D.
			COMPOSITE START	COMPOSITE END/GRAB					DATE	TIME	DATE	TIME	HCl	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>								
1	S-LMW-1S				G	WT	4															288W 83N 8330 04	
2	S-LMW-2S				G	WT	1															602	
3	S-LMW-3S				G	WT	1															603	
4	S-LMW-4S				G	WT	12															688W 388W 2.0 38830 04	
5	S-LMW-5S				G	WT	4															288W 83N 2.0 8330 04	
6	S-LMW-6S				G	WT	1															600	
7	S-LMW-7S				G	WT	1															607	
8	S-LMW-8S				G	WT	1															02X	
9	S-LMW-9S				G	WT	1															02Y	
10	S-BMW-1S				G	WT	1															010	
11	S-BMW-2S				G	WT	1															011	
12	S-LMW-DUP-1				G	WT	1															012	

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 1470A Hg	John Ingram / Golder	5/12/16	1600	John Ingram / Golder	5/12/16	1600	Y
EPA 200.8: Sb, As, Cd, Cr, Se, Tl	John Ingram / Golder	5/12/16	1730	John Ingram / Golder	5/12/16	1730	Y
	John Ingram / Golder	5/12/16	1730	John Ingram / Golder	5/12/16	1730	Y
	John Ingram / Golder	5/12/16	1730	John Ingram / Golder	5/12/16	1730	Y

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: John Ingram

SIGNATURE of SAMPLER: [Signature]

DATE Signed (MM/DD/YYYY): 5/12/16

Temp in °C: 26

Received on: 5/12/16

Ice (Y/N): Y

Cooler (Y/N): Y

Samples Intact (Y/N): Y



January 04, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261459

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on June 15, 2016. 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.

This report has been reissued on July 13, 2016 to correct the sample IDs for sample 011 and 012 as per client request.

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60221328003	UG-3	Water	06/14/16 09:30	06/15/16 03:05
60221328008	TMW-1	Water	06/14/16 09:15	06/15/16 03:05
60221328009	TMW-2	Water	06/14/16 10:25	06/15/16 03:05
60221328010	TMW-3	Water	06/14/16 11:40	06/15/16 03:05
60221328011	S-UWL-FB-1	Water	06/13/16 15:45	06/15/16 03:05
60221328012	S-UWL-DUP-1	Water	06/13/16 08:00	06/15/16 03:05

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60221328003	UG-3	EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60221328008	TMW-1	EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
60221328009	TMW-2	SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60221328010	TMW-3	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60221328011	S-UWL-FB-1	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60221328012	S-UWL-DUP-1	EPA 200.7	JGP	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: UG-3**      **Lab ID: 60221328003**      Collected: 06/14/16 09:30      Received: 06/15/16 03:05      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>236</b>	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:09	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:09	7440-41-7	
Boron	<b>674</b>	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:09	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:09	7440-70-2	M1
Cobalt	<b>10.3</b>	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:09	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:09	7439-92-1	
Lithium	<b>32.5</b>	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:09	7439-93-2	
Molybdenum	<b>3.3J</b>	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:09	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.41J</b>	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 14:38	7440-36-0	B
Arsenic	<b>0.44J</b>	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 14:38	7440-38-2	
Cadmium	<b>0.40J</b>	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 14:38	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 14:38	7440-47-3	
Selenium	<b>1.2</b>	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 14:38	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 14:38	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:13	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>553</b>	mg/L	5.0	5.0	1		06/20/16 11:55		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>34.6</b>	mg/L	5.0	2.5	5		06/26/16 11:55	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.073	1		06/25/16 17:17	16984-48-8	
Sulfate	<b>108</b>	mg/L	10.0	2.5	10		06/26/16 12:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: TMW-1**      **Lab ID: 60221328008**      Collected: 06/14/16 09:15      Received: 06/15/16 03:05      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>222</b>	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:39	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:39	7440-41-7	
Boron	<b>70.9J</b>	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:39	7440-42-8	
Calcium	<b>114000</b>	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:39	7440-70-2	
Cobalt	<b>1.1J</b>	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:39	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:39	7439-92-1	
Lithium	<b>28.2</b>	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:39	7439-93-2	
Molybdenum	<b>3.6J</b>	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:39	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.21J</b>	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 15:09	7440-36-0	B
Arsenic	<b>0.59J</b>	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 15:09	7440-38-2	
Cadmium	<b>0.034J</b>	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 15:09	7440-43-9	
Chromium	<b>0.75J</b>	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 15:09	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 15:09	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 15:09	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:28	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>411</b>	mg/L	5.0	5.0	1		06/20/16 11:56		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.0</b>	mg/L	1.0	0.50	1		06/25/16 19:02	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.073	1		06/25/16 19:02	16984-48-8	
Sulfate	<b>23.2</b>	mg/L	2.0	0.50	2		06/26/16 13:52	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: TMW-2**      **Lab ID: 60221328009**      Collected: 06/14/16 10:25      Received: 06/15/16 03:05      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>235</b>	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:43	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:43	7440-41-7	
Boron	<b>82.2J</b>	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:43	7440-42-8	
Calcium	<b>115000</b>	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:43	7440-70-2	
Cobalt	<b>1.2J</b>	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:43	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:43	7439-92-1	
Lithium	<b>31.2</b>	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:43	7439-93-2	
Molybdenum	<b>4.2J</b>	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:43	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.17J</b>	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 15:14	7440-36-0	B
Arsenic	<b>3.5</b>	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 15:14	7440-38-2	
Cadmium	<b>0.12J</b>	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 15:14	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 15:14	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 15:14	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 15:14	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:31	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>441</b>	mg/L	5.0	5.0	1		06/20/16 11:56		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.9</b>	mg/L	1.0	0.50	1		06/25/16 19:17	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.073	1		06/25/16 19:17	16984-48-8	
Sulfate	<b>34.7</b>	mg/L	2.0	0.50	2		06/26/16 14:07	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: TMW-3**      **Lab ID: 60221328010**      Collected: 06/14/16 11:40      Received: 06/15/16 03:05      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>210</b>	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:46	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:46	7440-41-7	
Boron	<b>78.5J</b>	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:46	7440-42-8	
Calcium	<b>119000</b>	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:46	7440-70-2	
Cobalt	<b>1.2J</b>	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:46	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:46	7439-92-1	
Lithium	<b>31.4</b>	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:46	7439-93-2	
Molybdenum	<b>4.7J</b>	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:46	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.14J</b>	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 15:18	7440-36-0	B
Arsenic	<b>2.4</b>	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 15:18	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 15:18	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 15:18	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 15:18	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 15:18	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:33	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>487</b>	mg/L	5.0	5.0	1		06/20/16 11:57		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.5</b>	mg/L	1.0	0.50	1		06/25/16 19:31	16887-00-6	
Fluoride	<b>0.23</b>	mg/L	0.20	0.073	1		06/25/16 19:31	16984-48-8	
Sulfate	<b>52.4</b>	mg/L	5.0	1.2	5		06/26/16 14:22	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Sample: S-UWL-FB-1 Lab ID: 60221328011 Collected: 06/13/16 15:45 Received: 06/15/16 03:05 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<0.58	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:50	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:50	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:50	7440-42-8	
Calcium	14.6J	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:50	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:50	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:50	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:50	7439-93-2	
Molybdenum	<0.52	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:50	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.096J	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 15:22	7440-36-0	B
Arsenic	<0.10	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 15:22	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 15:22	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 15:22	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 15:22	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 15:22	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.039	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:35	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	10.0	mg/L	5.0	5.0	1		06/16/16 09:09		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.3	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		06/25/16 19:46	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		06/25/16 19:46	16984-48-8	
Sulfate	<0.25	mg/L	1.0	0.25	1		06/25/16 19:46	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: S-UWL-DUP-1**      **Lab ID: 60221328012**      Collected: 06/13/16 08:00      Received: 06/15/16 03:05      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>295</b>	ug/L	10.0	0.58	1	06/15/16 16:15	06/22/16 14:54	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	06/15/16 16:15	06/22/16 14:54	7440-41-7	
Boron	<b>101</b>	ug/L	100	50.0	1	06/15/16 16:15	06/22/16 14:54	7440-42-8	
Calcium	<b>128000</b>	ug/L	100	8.1	1	06/15/16 16:15	06/22/16 14:54	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	06/15/16 16:15	06/22/16 14:54	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	06/15/16 16:15	06/22/16 14:54	7439-92-1	
Lithium	<b>39.4</b>	ug/L	10.0	4.9	1	06/15/16 16:15	06/22/16 14:54	7439-93-2	
Molybdenum	<b>0.77J</b>	ug/L	20.0	0.52	1	06/15/16 16:15	06/22/16 14:54	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.15J</b>	ug/L	1.0	0.058	1	06/15/16 16:15	06/16/16 15:27	7440-36-0	B
Arsenic	<b>0.43J</b>	ug/L	1.0	0.10	1	06/15/16 16:15	06/16/16 15:27	7440-38-2	
Cadmium	<b>0.055J</b>	ug/L	0.50	0.029	1	06/15/16 16:15	06/16/16 15:27	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	06/15/16 16:15	06/16/16 15:27	7440-47-3	
Selenium	<b>0.59J</b>	ug/L	1.0	0.18	1	06/15/16 16:15	06/16/16 15:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	06/15/16 16:15	06/16/16 15:27	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	06/22/16 10:05	06/22/16 15:37	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>543</b>	mg/L	5.0	5.0	1		06/16/16 09:10		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		06/20/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.0</b>	mg/L	1.0	0.50	1		06/25/16 20:01	16887-00-6	
Fluoride	<b>0.27</b>	mg/L	0.20	0.073	1		06/25/16 20:01	16984-48-8	
Sulfate	<b>44.0</b>	mg/L	5.0	1.2	5		06/26/16 14:37	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 435583 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

METHOD BLANK: 1780282 Matrix: Water  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	0.095J	0.20	0.039	06/22/16 14:55	

LABORATORY CONTROL SAMPLE: 1780283

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780284 1780285

Parameter	Units	60221328001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury	ug/L	<0.039	5	5	5.2	4.8	103	97	75-125	6	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1780286 1780287

Parameter	Units	60221462001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury	ug/L	<0.039	5	5	5.0	5.0	100	100	75-125	0	20

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 434752 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

METHOD BLANK: 1776740 Matrix: Water  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	06/22/16 13:47	
Beryllium	ug/L	<0.26	1.0	0.26	06/22/16 13:47	
Boron	ug/L	<50.0	100	50.0	06/22/16 13:47	
Calcium	ug/L	<8.1	100	8.1	06/22/16 13:47	
Cobalt	ug/L	<0.72	5.0	0.72	06/22/16 13:47	
Lead	ug/L	<2.5	5.0	2.5	06/22/16 13:47	
Lithium	ug/L	<4.9	10.0	4.9	06/22/16 13:47	
Molybdenum	ug/L	<0.52	20.0	0.52	06/22/16 13:47	

LABORATORY CONTROL SAMPLE: 1776741

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Beryllium	ug/L	1000	960	96	85-115	
Boron	ug/L	1000	963	96	85-115	
Calcium	ug/L	10000	9550	96	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	981	98	85-115	
Lithium	ug/L	1000	1040	104	85-115	
Molybdenum	ug/L	1000	1040	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1776742 1776743

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60221328001 Result	Spike Conc.	Spike Conc.	MS Result						
Barium	ug/L	248	1000	1000	1250	1270	100	102	70-130	2	20
Beryllium	ug/L	<0.26	1000	1000	949	963	95	96	70-130	1	20
Boron	ug/L	244	1000	1000	1220	1220	98	98	70-130	0	20
Calcium	ug/L	136000	10000	10000	143000	146000	67	95	70-130	2	20 M1
Cobalt	ug/L	<0.72	1000	1000	980	971	98	97	70-130	1	20
Lead	ug/L	<2.5	1000	1000	947	945	95	94	70-130	0	20
Lithium	ug/L	38.5	1000	1000	1080	1100	104	106	70-130	1	20
Molybdenum	ug/L	2.2J	1000	1000	1040	1030	103	103	70-130	0	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

MATRIX SPIKE SAMPLE:		1776744					
Parameter	Units	60221328003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	236	1000	1240	100	70-130	
Beryllium	ug/L	<0.26	1000	957	96	70-130	
Boron	ug/L	674	1000	1640	96	70-130	
Calcium	ug/L	121000	10000	123000	18	70-130	M1
Cobalt	ug/L	10.3	1000	997	99	70-130	
Lead	ug/L	<2.5	1000	944	94	70-130	
Lithium	ug/L	32.5	1000	1090	105	70-130	
Molybdenum	ug/L	3.3J	1000	1040	104	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch:	434748	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012		

METHOD BLANK: 1776731 Matrix: Water  
Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.099J	1.0	0.058	06/16/16 14:08	
Arsenic	ug/L	<0.10	1.0	0.10	06/16/16 14:08	
Cadmium	ug/L	<0.029	0.50	0.029	06/16/16 14:08	
Chromium	ug/L	<0.34	1.0	0.34	06/16/16 14:08	
Selenium	ug/L	<0.18	1.0	0.18	06/16/16 14:08	
Thallium	ug/L	<0.50	1.0	0.50	06/16/16 14:08	

LABORATORY CONTROL SAMPLE: 1776732

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.5	99	85-115	
Arsenic	ug/L	40	40.2	101	85-115	
Cadmium	ug/L	40	39.5	99	85-115	
Chromium	ug/L	40	42.5	106	85-115	
Selenium	ug/L	40	38.0	95	85-115	
Thallium	ug/L	40	37.2	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1776733 1776734

Parameter	Units	60221328001		60221328002		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.							
Antimony	ug/L	0.19J	40	40	40.0	39.7	99	99	70-130	1	20	
Arsenic	ug/L	0.53J	40	40	41.3	41.5	102	102	70-130	1	20	
Cadmium	ug/L	0.12J	40	40	38.4	39.0	96	97	70-130	1	20	
Chromium	ug/L	0.61J	40	40	42.3	43.7	104	108	70-130	3	20	
Selenium	ug/L	2.2	40	40	38.0	38.1	89	90	70-130	0	20	
Thallium	ug/L	<0.50	40	40	35.0	35.9	88	90	70-130	2	20	

MATRIX SPIKE SAMPLE: 1776735

Parameter	Units	60221328002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.34J	40	39.8	99	70-130	
Arsenic	ug/L	0.75J	40	42.1	103	70-130	
Cadmium	ug/L	0.096J	40	38.2	95	70-130	
Chromium	ug/L	<0.34	40	42.6	106	70-130	
Selenium	ug/L	2.7	40	39.5	92	70-130	
Thallium	ug/L	<0.50	40	35.7	89	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 434868 Analysis Method: SM 2540C  
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
 Associated Lab Samples: 60221328011, 60221328012

METHOD BLANK: 1777255 Matrix: Water

Associated Lab Samples: 60221328011, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/16/16 08:52	

LABORATORY CONTROL SAMPLE: 1777256

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

SAMPLE DUPLICATE: 1777257

Parameter	Units	60221077001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1050	1060	0	10	

SAMPLE DUPLICATE: 1777258

Parameter	Units	60221328001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	665	669	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 435211

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010

METHOD BLANK: 1779149

Matrix: Water

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/20/16 11:53	

LABORATORY CONTROL SAMPLE: 1779150

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	997	100	80-120	

SAMPLE DUPLICATE: 1779151

Parameter	Units	60221319001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	467	467	0	10	

SAMPLE DUPLICATE: 1779152

Parameter	Units	60221346004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	901	904	0	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 435190 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

SAMPLE DUPLICATE: 1779089

Parameter	Units	60221328001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.3	1	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 436082 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

METHOD BLANK: 1782794 Matrix: Water  
 Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/25/16 15:33	
Fluoride	mg/L	<0.073	0.20	0.073	06/25/16 15:33	
Sulfate	mg/L	<0.25	1.0	0.25	06/25/16 15:33	

LABORATORY CONTROL SAMPLE: 1782795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1782796 1782797

Parameter	Units	60221657001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.37	2.5	2.5	2.7	2.7	92	93	80-120	1	15	

MATRIX SPIKE SAMPLE: 1782798

Parameter	Units	60221624001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	ND	5	5.4	93	80-120	
Fluoride	mg/L	2.1	2.5	4.4	94	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 436139

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328012

METHOD BLANK: 1783406

Matrix: Water

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/26/16 08:58	
Sulfate	mg/L	<0.25	1.0	0.25	06/26/16 08:58	

LABORATORY CONTROL SAMPLE: 1783407

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE SAMPLE: 1783410

Parameter	Units	60221328001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	66.4	50	117	100	80-120	
Sulfate	mg/L	83.8	50	135	102	80-120	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

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**Sample: UG-3**                      **Lab ID: 60221328003**    Collected: 06/14/16 09:30    Received: 06/15/16 03:05    Matrix: Water  
PWS:                                      Site ID:                                      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>1.27 ± 0.642 (0.216)</b> <b>C:NA T:90%</b>	pCi/L	07/11/16 22:22	13982-63-3	
Radium-228	EPA 904.0	<b>1.15 ± 0.537 (0.909)</b> <b>C:75% T:69%</b>	pCi/L	07/08/16 12:28	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

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**Sample: TMW-1**                      **Lab ID: 60221328008**    Collected: 06/14/16 09:15    Received: 06/15/16 03:05    Matrix: Water  
PWS:                                      Site ID:                                      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.066 ± 0.455 (0.936)</b> <b>C:NA T:92%</b>	pCi/L	07/11/16 21:39	13982-63-3	
Radium-228	EPA 904.0	<b>0.590 ± 0.363 (0.678)</b> <b>C:77% T:93%</b>	pCi/L	07/08/16 16:32	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

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**Sample: TMW-2**                      **Lab ID: 60221328009**    Collected: 06/14/16 10:25    Received: 06/15/16 03:05    Matrix: Water  
PWS:                                      Site ID:                                      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0745 ± 0.387 (0.802)</b> <b>C:NA T:95%</b>	pCi/L	07/11/16 22:33	13982-63-3	
Radium-228	EPA 904.0	<b>0.635 ± 0.413 (0.788)</b> <b>C:77% T:85%</b>	pCi/L	07/08/16 16:32	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

**Sample: TMW-3**      **Lab ID: 60221328010**      Collected: 06/14/16 11:40      Received: 06/15/16 03:05      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.464 ± 0.633 (0.988)</b> <b>C:NA T:84%</b>	pCi/L	07/11/16 22:09	13982-63-3	
Radium-228	EPA 904.0	<b>0.471 ± 0.393 (0.787)</b> <b>C:74% T:82%</b>	pCi/L	07/08/16 16:32	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

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**Sample: S-UWL-FB-1**      **Lab ID: 60221328011**      Collected: 06/13/16 15:45      Received: 06/15/16 03:05      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.247 ± 0.566 (0.989)</b> C:NA T:94%	pCi/L	07/11/16 22:23	13982-63-3	
Radium-228	EPA 904.0	<b>0.472 ± 0.430 (0.878)</b> C:73% T:80%	pCi/L	07/08/16 16:32	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.335 ± 0.520 (0.901)</b> C:NA T:90%	pCi/L	07/11/16 22:09	13982-63-3	
Radium-228	EPA 904.0	<b>0.696 ± 0.406 (0.741)</b> C:75% T:83%	pCi/L	07/08/16 16:32	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 224136 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

METHOD BLANK: 1096896 Matrix: Water

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.380 (0.613) C:NA T:89%	pCi/L	07/11/16 20:53	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

QC Batch: 224164 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

METHOD BLANK: 1096972 Matrix: Water

Associated Lab Samples: 60221328003, 60221328008, 60221328009, 60221328010, 60221328011, 60221328012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.719 ± 0.394 (0.711) C:79% T:85%	pCi/L	07/08/16 12:28	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

---

### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60221328003	UG-3	EPA 200.7	434752	EPA 200.7	434834
60221328008	TMW-1	EPA 200.7	434752	EPA 200.7	434834
60221328009	TMW-2	EPA 200.7	434752	EPA 200.7	434834
60221328010	TMW-3	EPA 200.7	434752	EPA 200.7	434834
60221328011	S-UWL-FB-1	EPA 200.7	434752	EPA 200.7	434834
60221328012	S-UWL-DUP-1	EPA 200.7	434752	EPA 200.7	434834
60221328003	UG-3	EPA 200.8	434748	EPA 200.8	434835
60221328008	TMW-1	EPA 200.8	434748	EPA 200.8	434835
60221328009	TMW-2	EPA 200.8	434748	EPA 200.8	434835
60221328010	TMW-3	EPA 200.8	434748	EPA 200.8	434835
60221328011	S-UWL-FB-1	EPA 200.8	434748	EPA 200.8	434835
60221328012	S-UWL-DUP-1	EPA 200.8	434748	EPA 200.8	434835
60221328003	UG-3	EPA 7470	435583	EPA 7470	435692
60221328008	TMW-1	EPA 7470	435583	EPA 7470	435692
60221328009	TMW-2	EPA 7470	435583	EPA 7470	435692
60221328010	TMW-3	EPA 7470	435583	EPA 7470	435692
60221328011	S-UWL-FB-1	EPA 7470	435583	EPA 7470	435692
60221328012	S-UWL-DUP-1	EPA 7470	435583	EPA 7470	435692
60221328003	UG-3	EPA 903.1	224136		
60221328008	TMW-1	EPA 903.1	224136		
60221328009	TMW-2	EPA 903.1	224136		
60221328010	TMW-3	EPA 903.1	224136		
60221328011	S-UWL-FB-1	EPA 903.1	224136		
60221328012	S-UWL-DUP-1	EPA 903.1	224136		
60221328003	UG-3	EPA 904.0	224164		
60221328008	TMW-1	EPA 904.0	224164		
60221328009	TMW-2	EPA 904.0	224164		
60221328010	TMW-3	EPA 904.0	224164		
60221328011	S-UWL-FB-1	EPA 904.0	224164		
60221328012	S-UWL-DUP-1	EPA 904.0	224164		
60221328003	UG-3	SM 2540C	435211		
60221328008	TMW-1	SM 2540C	435211		
60221328009	TMW-2	SM 2540C	435211		
60221328010	TMW-3	SM 2540C	435211		
60221328011	S-UWL-FB-1	SM 2540C	434868		
60221328012	S-UWL-DUP-1	SM 2540C	434868		
60221328003	UG-3	SM 4500-H+B	435190		
60221328008	TMW-1	SM 4500-H+B	435190		
60221328009	TMW-2	SM 4500-H+B	435190		
60221328010	TMW-3	SM 4500-H+B	435190		
60221328011	S-UWL-FB-1	SM 4500-H+B	435190		
60221328012	S-UWL-DUP-1	SM 4500-H+B	435190		
60221328003	UG-3	EPA 300.0	436082		
60221328003	UG-3	EPA 300.0	436139		

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**QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261459

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60221328008	TMW-1	EPA 300.0	436082		
60221328008	TMW-1	EPA 300.0	436139		
60221328009	TMW-2	EPA 300.0	436082		
60221328009	TMW-2	EPA 300.0	436139		
60221328010	TMW-3	EPA 300.0	436082		
60221328010	TMW-3	EPA 300.0	436139		
60221328011	S-UWL-FB-1	EPA 300.0	436082		
60221328012	S-UWL-DUP-1	EPA 300.0	436082		
60221328012	S-UWL-DUP-1	EPA 300.0	436139		

**REPORT OF LABORATORY ANALYSIS**

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Sample Condition Upon Receipt

WO#: 60221328
Barcode
60221328

Client Name: Golder

Courier: FedEx [ ] UPS [ ] VIA [ ] Clay [ ] PEX [ ] ECI [ ] Pace [ ] Other [x] Client [ ]

Tracking #: Pace Shipping Label Used? Yes [ ] No [x]

Custody Seal on Cooler/Box Present: Yes [x] No [ ] Seals intact: Yes [x] No [ ]

Packing Material: Bubble Wrap [ ] Bubble Bags [ ] Foam [ ] None [x] Other [ ]

Thermometer Used: CF-0.1 T-239 / CF 0.0 T-262 Type of Ice: Wet [x] Blue [ ] None [ ] Samples received on ice, cooling process has begun.

Cooler Temperature: 0.5/14.1/17.1
Temperature should be above freezing to 6°C

Date and initials of person examining contents: PV6/15/16

Table with 18 rows and 2 columns. Row 1: Chain of Custody present: [x] Yes [ ] No [ ] N/A 1. Row 2: Chain of Custody filled out: [x] Yes [ ] No [ ] N/A 2. Row 3: Chain of Custody relinquished: [x] Yes [ ] No [ ] N/A 3. Row 4: Sampler name & signature on COC: [x] Yes [ ] No [ ] N/A 4. Row 5: Samples arrived within holding time: [x] Yes [ ] No [ ] N/A 5. Row 6: Short Hold Time analyses (<72hr): [x] Yes [ ] No [ ] N/A 6. PH Row 7: Rush Turn Around Time requested: [ ] Yes [x] No [ ] N/A 7. Row 8: Sufficient volume: [x] Yes [ ] No [ ] N/A 8. Row 9: Correct containers used: [x] Yes [ ] No [ ] N/A 9. Row 10: Pace containers used: [x] Yes [ ] No [ ] N/A 9. Row 11: Containers intact: [x] Yes [ ] No [ ] N/A 10. Row 12: Unpreserved 5035A soils frozen w/in 48hrs? [ ] Yes [ ] No [x] N/A 11. Row 13: Filtered volume received for dissolved tests? [ ] Yes [ ] No [x] N/A 12. Row 14: Sample labels match COC: [x] Yes [ ] No [ ] N/A 13. Matrix: WT Row 15: All containers needing preservation have been checked. [x] Yes [ ] No [ ] N/A 14. Row 16: All containers needing preservation are found to be in compliance with EPA recommendation. [x] Yes [ ] No [ ] N/A 14. Row 17: Exceptions: VOA, Coliform, O&G, WI-DRO (water) [ ] Yes [x] No Initial when completed Lot # of added preservative Row 18: Trip Blank present: [ ] Yes [ ] No [x] N/A 15. Row 19: Pace Trip Blank lot # (if purchased): 15. Row 20: Headspace in VOA vials (>6mm): [ ] Yes [ ] No [x] N/A 16. Row 21: Project sampled in USDA Regulated Area: [ ] Yes [ ] No [x] N/A 17. List State: Row 22: Additional labels attached to 5035A vials in the field? [ ] Yes [ ] No [x] N/A 18.

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: G Date: 6/15/14



# CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A: Required Client Information: Company: **Goldier Associates** Section B: Reported Project Information: Report To: **Mark Haddock** (mhaddock@goldier.com) Section C: Invoice Information: Attention: \_\_\_\_\_

Address: **820 South Main Street, Suite 100** Copy To: **Jeffrey Ingram** Company Name: \_\_\_\_\_

Email To: **mhaddock@goldier.com** Purchase Order No.: \_\_\_\_\_ Address: \_\_\_\_\_

Phone: **636-724-9191** Fax: **636-724-9323** Project Name: **Ameren Sioux Energy Center** Pace Quote Reference: **Jamie Church**

Requested Due Date/TAT: **Standard** Project Number: **153-1406 0003** Pace Profile # **9285**

REGULATORY AGENCY: **NPDES** GROUND WATER: **RCRA** DRINKING WATER: **OTHER**

Site Location: **UST** MO STATE: **MO**

Temp in °C: **17.1** Received on Ice (Y/N): **N** Custody Sealed Cooler (Y/N): **Y** Samples Intact (Y/N): **Y**

Page: 1 of 1

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOL-SOLIDS S OT AR OT	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Requested Analysis Filtered (Y/N)		Residual Chlorine (Y/N)	SAMPLE CONDITIONS						
					DATE	TIME					DATE	TIME		Metals*	Chloride/Fluoride/Sulfate	TDS	pH	Radium 226 & 228	Temp in °C	Received on Ice (Y/N)
1	UG-1A		WT G			6/13/16	12:30	4	3	1	1	1	1	1	1	1	1	1	1	1
2	UG-2		WT G			6/14/16	10:15	4	1	3	1	1	1	1	1	1	1	1	1	1
3	UG-3		WT G			6/14/16	09:30	4	1	3	1	1	1	1	1	1	1	1	1	1
4	UG-1		WT G			6/13/16	12:00	1	1	1	1	1	1	1	1	1	1	1	1	1
5	UG-2		WT G			6/12/16	13:15	1	1	1	1	1	1	1	1	1	1	1	1	1
6	UG-3		WT G			6/13/16	14:40	1	1	1	1	1	1	1	1	1	1	1	1	1
7	UG-4		WT G			6/13/16	15:25	1	1	1	1	1	1	1	1	1	1	1	1	1
8	TMW-1		WT G			6/14/16	09:15	1	1	1	1	1	1	1	1	1	1	1	1	1
9	TMW-2		WT G			6/14/16	11:40	1	1	1	1	1	1	1	1	1	1	1	1	1
10	TMW-3		WT G			6/14/16	11:40	1	1	1	1	1	1	1	1	1	1	1	1	1
11	5-FB-198 S-UWL-FB-1		WT G			6/13/16	15:45	1	1	1	1	1	1	1	1	1	1	1	1	1
12	S-UWL-DUP-1		WT G			6/13/16	---	1	1	1	1	1	1	1	1	1	1	1	1	1

ADDITIONAL COMMENTS: EPA 200.7, Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 1470A, Hg EPA 200.8, Sb, As, Cd, Cr, Se, Ti

REINQUISHED BY INFILTRATION: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

ACCEPTED BY INFILTRATION: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

SAMPLER NAME AND SIGNATURE: \_\_\_\_\_

PRINT Name of SAMPLER: **John Snodgrass** DATE Signed (MM/DD/YY): **06/14/16**

SIGNATURE of SAMPLER: *[Signature]*

60224324



January 04, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-UWL  
Pace Project No.: 60223187

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 09, 2016. 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,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60223187001	S-UG-3	Water	07/08/16 12:44	07/09/16 04:45
60223187004	S-TMW-1	Water	07/08/16 09:00	07/09/16 04:45
60223187005	S-TMW-2	Water	07/08/16 09:57	07/09/16 04:45
60223187006	S-TMW-3	Water	07/08/16 11:03	07/09/16 04:45
60223187007	S-UWL-FB-1	Water	07/08/16 15:25	07/09/16 04:45
60223199005	S-UWL-DUP-1	Water	07/07/16 08:00	07/09/16 04:45
60223195005	S-BMW-1S	Water	07/05/16 13:28	07/09/16 04:45

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60223187001	S-UG-3	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
60223187004	S-TMW-1	EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
60223187005	S-TMW-2	SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60223187006	S-TMW-3	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60223187007	S-UWL-FB-1	EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60223199005	S-UWL-DUP-1	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
60223195005	S-BMW-1S	EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-UG-3**      **Lab ID: 60223187001**      Collected: 07/08/16 12:44      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>208</b>	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:09	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:09	7440-41-7	
Boron	<b>375</b>	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:09	7440-42-8	
Calcium	<b>103000</b>	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:09	7440-70-2	
Cobalt	<b>2.4J</b>	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:09	7440-48-4	
Lead	<b>4.7J</b>	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:09	7439-92-1	
Lithium	<b>26.9</b>	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:09	7439-93-2	
Molybdenum	<b>3.4J</b>	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:09	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.17J</b>	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 16:27	7440-36-0	
Arsenic	<b>0.33J</b>	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 16:27	7440-38-2	
Cadmium	<b>0.22J</b>	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 16:27	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 16:27	7440-47-3	
Selenium	<b>2.6</b>	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 16:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 16:27	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 09:50	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>506</b>	mg/L	5.0	5.0	1		07/15/16 12:06		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		07/12/16 10:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>44.2</b>	mg/L	5.0	2.5	5		07/23/16 10:04	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.073	1		07/20/16 13:52	16984-48-8	
Sulfate	<b>61.0</b>	mg/L	5.0	1.2	5		07/23/16 10:04	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-TMW-1**      **Lab ID: 60223187004**      Collected: 07/08/16 09:00      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>219</b>	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:15	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:15	7440-41-7	
Boron	<b>64.6J</b>	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:15	7440-42-8	
Calcium	<b>106000</b>	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:15	7440-70-2	
Cobalt	<b>1.7J</b>	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:15	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:15	7439-92-1	
Lithium	<b>25.1</b>	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:15	7439-93-2	
Molybdenum	<b>3.4J</b>	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:15	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.12J</b>	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 16:36	7440-36-0	
Arsenic	<b>0.47J</b>	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 16:36	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 16:36	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 16:36	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 16:36	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 16:36	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 09:56	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>411</b>	mg/L	5.0	5.0	1		07/15/16 12:09		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		07/12/16 10:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.3</b>	mg/L	1.0	0.50	1		07/20/16 15:06	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.073	1		07/20/16 15:06	16984-48-8	
Sulfate	<b>25.7</b>	mg/L	2.0	0.50	2		07/23/16 13:44	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-TMW-2**      **Lab ID: 60223187005**      Collected: 07/08/16 09:57      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>243</b>	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:18	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:18	7440-41-7	
Boron	<b>77.4J</b>	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:18	7440-42-8	
Calcium	<b>113000</b>	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:18	7440-70-2	
Cobalt	<b>2.1J</b>	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:18	7440-48-4	
Lead	<b>3.3J</b>	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:18	7439-92-1	
Lithium	<b>30.1</b>	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:18	7439-93-2	
Molybdenum	<b>5.1J</b>	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:18	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 16:39	7440-36-0	
Arsenic	<b>4.7</b>	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 16:39	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 16:39	7440-43-9	
Chromium	<b>0.55J</b>	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 16:39	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 16:39	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 16:39	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 09:59	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>445</b>	mg/L	5.0	5.0	1		07/15/16 12:10		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		07/12/16 10:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.2</b>	mg/L	1.0	0.50	1		07/20/16 15:21	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.073	1		07/20/16 15:21	16984-48-8	
Sulfate	<b>34.3</b>	mg/L	2.0	0.50	2		07/23/16 13:58	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-TMW-3**      **Lab ID: 60223187006**      Collected: 07/08/16 11:03      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>187</b>	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:20	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:20	7440-41-7	
Boron	<b>81.2J</b>	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:20	7440-42-8	
Calcium	<b>112000</b>	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:20	7440-70-2	
Cobalt	<b>2.7J</b>	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:20	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:20	7439-92-1	
Lithium	<b>30.4</b>	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:20	7439-93-2	
Molybdenum	<b>5.8J</b>	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:20	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 16:42	7440-36-0	
Arsenic	<b>3.3</b>	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 16:42	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 16:42	7440-43-9	
Chromium	<b>0.45J</b>	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 16:42	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 16:42	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 16:42	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 10:01	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>473</b>	mg/L	5.0	5.0	1		07/15/16 12:11		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		07/12/16 10:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.4</b>	mg/L	1.0	0.50	1		07/20/16 15:35	16887-00-6	
Fluoride	<b>0.24</b>	mg/L	0.20	0.073	1		07/20/16 15:35	16984-48-8	
Sulfate	<b>51.8</b>	mg/L	5.0	1.2	5		07/23/16 14:12	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-UWL-FB-1**      **Lab ID: 60223187007**      Collected: 07/08/16 15:25      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<0.58	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:22	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:22	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:22	7440-42-8	
Calcium	47.5J	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:22	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:22	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:22	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:22	7439-93-2	
Molybdenum	<0.52	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:22	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<0.058	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 16:45	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 16:45	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 16:45	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 16:45	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 16:45	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 16:45	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<0.039	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 10:03	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	6.0	mg/L	5.0	5.0	1		07/15/16 12:11		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.1	Std. Units	0.10	0.10	1		07/12/16 10:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		07/20/16 15:50	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		07/20/16 15:50	16984-48-8	
Sulfate	<0.25	mg/L	1.0	0.25	1		07/20/16 15:50	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-UWL-DUP-1**      **Lab ID: 60223199005**      Collected: 07/07/16 08:00      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>255</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:50	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:50	7440-41-7	
Boron	<b>98.5J</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:50	7440-42-8	
Calcium	<b>137000</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:50	7440-70-2	
Cobalt	<b>1.1J</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:50	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:50	7439-92-1	
Lithium	<b>34.9</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:50	7439-93-2	
Molybdenum	<b>1.7J</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:50	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.10J</b>	ug/L	1.0	0.058	1	07/13/16 12:10	07/21/16 18:51	7440-36-0	
Arsenic	<b>0.48J</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 18:51	7440-38-2	
Cadmium	<b>0.039J</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 18:51	7440-43-9	
Chromium	<b>0.43J</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 18:51	7440-47-3	
Selenium	<b>0.62J</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 18:51	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 18:51	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 11:25	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>522</b>	mg/L	5.0	5.0	1		07/12/16 14:26		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		07/12/16 09:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>9.3</b>	mg/L	1.0	0.50	1		07/21/16 00:25	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.073	1		07/21/16 00:25	16984-48-8	
Sulfate	<b>53.2</b>	mg/L	5.0	1.2	5		07/24/16 02:11	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-BMW-1S**      **Lab ID: 60223195005**      Collected: 07/05/16 13:28      Received: 07/09/16 04:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>137</b>	ug/L	10.0	0.58	1	07/12/16 15:50	07/15/16 16:42	7440-39-3	M1
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/12/16 15:50	07/15/16 16:42	7440-41-7	M1
Boron	<b>93.0J</b>	ug/L	100	50.0	1	07/12/16 15:50	07/15/16 16:42	7440-42-8	M1
Calcium	<b>140000</b>	ug/L	100	8.1	1	07/12/16 15:50	07/15/16 16:42	7440-70-2	M1
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/12/16 15:50	07/15/16 16:42	7440-48-4	M1
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/12/16 15:50	07/15/16 16:42	7439-92-1	M1
Lithium	<b>5.0J</b>	ug/L	10.0	4.9	1	07/12/16 15:50	07/15/16 16:42	7439-93-2	M1
Molybdenum	<b>2.5J</b>	ug/L	20.0	0.52	1	07/12/16 15:50	07/15/16 16:42	7439-98-7	M1
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.063J</b>	ug/L	1.0	0.058	1	07/12/16 15:50	07/21/16 17:13	7440-36-0	
Arsenic	<b>0.88J</b>	ug/L	1.0	0.10	1	07/12/16 15:50	07/21/16 17:13	7440-38-2	
Cadmium	<b>0.095J</b>	ug/L	0.50	0.029	1	07/12/16 15:50	07/21/16 17:13	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/12/16 15:50	07/21/16 17:13	7440-47-3	
Selenium	<b>0.25J</b>	ug/L	1.0	0.18	1	07/12/16 15:50	07/21/16 17:13	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/12/16 15:50	07/21/16 17:13	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	07/11/16 16:00	07/12/16 10:23	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>526</b>	mg/L	5.0	5.0	1		07/11/16 16:10		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		07/11/16 11:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.7</b>	mg/L	1.0	0.50	1		07/20/16 17:48	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.073	1		07/20/16 17:48	16984-48-8	
Sulfate	<b>30.2</b>	mg/L	2.0	0.50	2		07/23/16 17:01	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438034

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

METHOD BLANK: 1791509

Matrix: Water

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	07/12/16 09:45	

LABORATORY CONTROL SAMPLE: 1791510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.7	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1791511 1791512

Parameter	Units	60223195001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Mercury	ug/L	<0.039	5	4.8	5	5.0	96	101	75-125	5	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1791513 1791514

Parameter	Units	60223196001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Mercury	ug/L	<0.039	5	5.3	5	5.8	106	115	75-125	9	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438036

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60223199005

METHOD BLANK: 1791515

Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	07/12/16 10:50	

LABORATORY CONTROL SAMPLE: 1791516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1791517 1791518

Parameter	Units	60223199002		1791517		1791518		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	<0.039	5	5	5	5.1	4.9	102	98	75-125	4	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438181 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

METHOD BLANK: 1792061 Matrix: Water  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	07/15/16 16:04	
Beryllium	ug/L	<0.26	1.0	0.26	07/15/16 16:04	
Boron	ug/L	<50.0	100	50.0	07/15/16 16:04	
Calcium	ug/L	11.3J	100	8.1	07/15/16 16:04	
Cobalt	ug/L	<0.72	5.0	0.72	07/15/16 16:04	
Lead	ug/L	<2.5	5.0	2.5	07/15/16 16:04	
Lithium	ug/L	<4.9	10.0	4.9	07/15/16 16:04	
Molybdenum	ug/L	<0.52	20.0	0.52	07/15/16 16:04	

LABORATORY CONTROL SAMPLE: 1792062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1060	106	85-115	
Beryllium	ug/L	1000	971	97	85-115	
Boron	ug/L	1000	966	97	85-115	
Calcium	ug/L	10000	9290	93	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792063 1792064

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		60223195001 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Barium	ug/L	146	1000	1000	1190	1190	104	104	70-130	0	20	
Beryllium	ug/L	<0.26	1000	1000	960	983	96	98	70-130	2	20	
Boron	ug/L	932	1000	1000	1920	1990	99	106	70-130	3	20	
Calcium	ug/L	157000	10000	10000	165000	165000	76	78	70-130	0	20	
Cobalt	ug/L	3.4J	1000	1000	996	1010	99	101	70-130	2	20	
Lead	ug/L	<2.5	1000	1000	986	1010	98	101	70-130	2	20	
Lithium	ug/L	23.0	1000	1000	1060	1060	104	104	70-130	1	20	
Molybdenum	ug/L	63.8	1000	1000	1140	1150	108	109	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

MATRIX SPIKE SAMPLE:		1795267					
Parameter	Units	60223195003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	77.4	1000	1020	94	70-130	
Beryllium	ug/L	<0.26	1000	995	100	70-130	
Boron	ug/L	11800	1000	12500	75	70-130	
Calcium	ug/L	268000	10000	301000	333	70-130	M1
Cobalt	ug/L	1.0J	1000	951	95	70-130	
Lead	ug/L	<2.5	1000	971	97	70-130	
Lithium	ug/L	60.8	1000	1040	98	70-130	
Molybdenum	ug/L	497	1000	1500	100	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438289 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60223199005

METHOD BLANK: 1792560 Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	07/15/16 17:00	
Beryllium	ug/L	<0.26	1.0	0.26	07/15/16 17:00	
Boron	ug/L	<50.0	100	50.0	07/15/16 17:00	
Calcium	ug/L	22.9J	100	8.1	07/15/16 17:00	
Cobalt	ug/L	<0.72	5.0	0.72	07/15/16 17:00	
Lead	ug/L	<2.5	5.0	2.5	07/15/16 17:00	
Lithium	ug/L	<4.9	10.0	4.9	07/15/16 17:00	
Molybdenum	ug/L	0.74J	20.0	0.52	07/15/16 17:00	

LABORATORY CONTROL SAMPLE: 1792561

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Beryllium	ug/L	1000	981	98	85-115	
Boron	ug/L	1000	978	98	85-115	
Calcium	ug/L	10000	9680	97	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	962	96	85-115	
Molybdenum	ug/L	1000	1060	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792562 1792563

Parameter	Units	60223196001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MSD Result	% Rec	MSD % Rec					
Barium	ug/L	138	1000	1000	1150	1140	101	101	70-130	1	20		
Beryllium	ug/L	<0.26	1000	1000	992	984	99	98	70-130	1	20		
Boron	ug/L	810	1000	1000	1810	1770	100	96	70-130	2	20		
Calcium	ug/L	68600	10000	10000	78300	76400	97	78	70-130	2	20		
Cobalt	ug/L	<0.72	1000	1000	1010	997	101	100	70-130	1	20		
Lead	ug/L	<2.5	1000	1000	1000	994	100	99	70-130	1	20		
Lithium	ug/L	13.7	1000	1000	1010	1000	99	99	70-130	1	20		
Molybdenum	ug/L	40.3	1000	1000	1110	1100	107	106	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Parameter	Units	60223199002		1792564		1792565		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Barium	ug/L	246	1000	1000	1240	1270	99	102	70-130	2	20			
Beryllium	ug/L	<0.26	1000	1000	997	1020	100	102	70-130	2	20			
Boron	ug/L	116	1000	1000	1110	1140	99	102	70-130	2	20			
Calcium	ug/L	128000	10000	10000	140000	142000	114	135	70-130	1	20	M1		
Cobalt	ug/L	<0.72	1000	1000	988	1010	99	101	70-130	3	20			
Lead	ug/L	<2.5	1000	1000	991	1010	99	101	70-130	2	20			
Lithium	ug/L	32.8	1000	1000	1020	1030	98	100	70-130	2	20			
Molybdenum	ug/L	1.5J	1000	1000	1050	1080	105	107	70-130	2	20			

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438182 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

METHOD BLANK: 1792066 Matrix: Water  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	07/21/16 16:21	
Arsenic	ug/L	<0.10	1.0	0.10	07/21/16 16:21	
Cadmium	ug/L	<0.029	0.50	0.029	07/21/16 16:21	
Chromium	ug/L	<0.34	1.0	0.34	07/21/16 16:21	
Selenium	ug/L	<0.18	1.0	0.18	07/21/16 16:21	
Thallium	ug/L	<0.50	1.0	0.50	07/21/16 16:21	

LABORATORY CONTROL SAMPLE: 1792067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.3	103	85-115	
Arsenic	ug/L	40	41.5	104	85-115	
Cadmium	ug/L	40	41.4	103	85-115	
Chromium	ug/L	40	41.9	105	85-115	
Selenium	ug/L	40	39.8	100	85-115	
Thallium	ug/L	40	37.6	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792068 1792069

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60223195001 Result	Spike Conc.	Spike Conc.	MS Result					
Antimony	ug/L	0.35J	40	40	44.0	41.6	109	103	70-130	5 20
Arsenic	ug/L	1.7	40	40	49.3	42.9	119	103	70-130	14 20
Cadmium	ug/L	0.083J	40	40	42.7	39.5	106	99	70-130	8 20
Chromium	ug/L	0.51J	40	40	41.9	41.5	104	102	70-130	1 20
Selenium	ug/L	11.7	40	40	63.6	50.0	130	96	70-130	24 20 R1
Thallium	ug/L	<0.50	40	40	38.8	39.9	97	100	70-130	3 20

MATRIX SPIKE SAMPLE: 1792070

Parameter	Units	60223195005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.063J	40	40.8	102	70-130	
Arsenic	ug/L	0.88J	40	41.8	102	70-130	
Cadmium	ug/L	0.095J	40	40.1	100	70-130	
Chromium	ug/L	<0.34	40	40.9	102	70-130	
Selenium	ug/L	0.25J	40	37.9	94	70-130	
Thallium	ug/L	<0.50	40	38.8	97	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438290 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60223199005

METHOD BLANK: 1792566 Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	07/21/16 17:34	
Arsenic	ug/L	<0.10	1.0	0.10	07/21/16 17:34	
Cadmium	ug/L	<0.029	0.50	0.029	07/21/16 17:34	
Chromium	ug/L	<0.34	1.0	0.34	07/21/16 17:34	
Selenium	ug/L	<0.18	1.0	0.18	07/21/16 17:34	
Thallium	ug/L	<0.50	1.0	0.50	07/21/16 17:34	

LABORATORY CONTROL SAMPLE: 1792567

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.2	103	85-115	
Arsenic	ug/L	40	41.6	104	85-115	
Cadmium	ug/L	40	40.9	102	85-115	
Chromium	ug/L	40	41.7	104	85-115	
Selenium	ug/L	40	40.8	102	85-115	
Thallium	ug/L	40	37.4	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792568 1792569

Parameter	Units	60223196001		MSD		MSD		% Rec		Max		Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Antimony	ug/L	0.078J	40	40	41.2	41.7	103	104	70-130	1	20	
Arsenic	ug/L	1.1	40	40	42.3	42.1	103	102	70-130	1	20	
Cadmium	ug/L	<0.029	40	40	40.3	40.5	101	101	70-130	0	20	
Chromium	ug/L	<0.34	40	40	40.6	41.6	101	104	70-130	3	20	
Selenium	ug/L	<0.18	40	40	38.8	39.1	97	97	70-130	1	20	
Thallium	ug/L	<0.50	40	40	38.3	38.7	96	97	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792570 1792571

Parameter	Units	60223199002		MSD		MSD		% Rec		Max		Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	RPD	
Antimony	ug/L	0.11J	40	40	41.3	41.2	103	103	70-130	0	20	
Arsenic	ug/L	0.44J	40	40	41.3	42.3	102	105	70-130	2	20	
Cadmium	ug/L	0.042J	40	40	39.5	40.4	99	101	70-130	2	20	
Chromium	ug/L	<0.34	40	40	41.3	41.4	103	103	70-130	0	20	
Selenium	ug/L	3.2	40	40	41.4	41.8	96	97	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1792570												1792571	
Parameter	Units	60223199002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max	Qual	
			Spike Conc.	Spike Conc.							RPD		
Thallium	ug/L	<0.50	40	40	38.2	38.7	95	97	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438032

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60223195005

METHOD BLANK: 1791505

Matrix: Water

Associated Lab Samples: 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/11/16 16:06	

LABORATORY CONTROL SAMPLE: 1791506

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	993	99	80-120	

SAMPLE DUPLICATE: 1791507

Parameter	Units	60223195001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	915	911	0	10	

SAMPLE DUPLICATE: 1791508

Parameter	Units	60223196001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	376	373	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438069

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60223199005

METHOD BLANK: 1791598

Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/12/16 14:08	

LABORATORY CONTROL SAMPLE: 1791599

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

SAMPLE DUPLICATE: 1791600

Parameter	Units	60223065001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	385	388	1	10	

SAMPLE DUPLICATE: 1791601

Parameter	Units	60223199002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	489	497	2	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 438659

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

METHOD BLANK: 1794258

Matrix: Water

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/15/16 11:50	

LABORATORY CONTROL SAMPLE: 1794259

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

SAMPLE DUPLICATE: 1794260

Parameter	Units	60223185001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4850	4870	0	10	

SAMPLE DUPLICATE: 1794262

Parameter	Units	60223185013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1740	1750	0	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 437868

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60223195005

SAMPLE DUPLICATE: 1791140

Parameter	Units	60223195001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	5	H6

SAMPLE DUPLICATE: 1791141

Parameter	Units	60223196001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.6	7.6	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 437870 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60223199005

SAMPLE DUPLICATE: 1791144

Parameter	Units	60222963003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 437871 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

SAMPLE DUPLICATE: 1791145

Parameter	Units	60223199002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.2	1	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 439322

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

METHOD BLANK: 1796767

Matrix: Water

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007, 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	07/20/16 12:54	
Fluoride	mg/L	<0.027	0.20	0.027	07/20/16 12:54	
Sulfate	mg/L	<0.15	1.0	0.15	07/20/16 12:54	

LABORATORY CONTROL SAMPLE: 1796768

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	90-110	
Fluoride	mg/L	2.5	2.3	94	90-110	
Sulfate	mg/L	5	4.7	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1796769 1796770

Parameter	Units	60223187001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.30	2.5	2.5	2.7	2.7	94	96	80-120	2	15	

MATRIX SPIKE SAMPLE: 1796771

Parameter	Units	60223195001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.21	2.5	2.5	92	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 439323	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60223199005	

METHOD BLANK: 1796773 Matrix: Water  
Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	07/20/16 18:47	
Fluoride	mg/L	<0.027	0.20	0.027	07/20/16 18:47	

LABORATORY CONTROL SAMPLE: 1796774

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1796775 1796776

Parameter	Units	60223196001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Fluoride	mg/L	0.22	2.5	2.5	2.5	2.6	93	96	80-120	3	15		

MATRIX SPIKE SAMPLE: 1796777

Parameter	Units	60223199002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	7.5	5	12.2	94	80-120	
Fluoride	mg/L	0.28	2.5	2.6	94	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 439702 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223195005

METHOD BLANK: 1798939 Matrix: Water  
 Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223195005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	07/23/16 08:56	
Sulfate	mg/L	<0.15	1.0	0.15	07/23/16 08:56	

LABORATORY CONTROL SAMPLE: 1798940

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1798941 1798942

Parameter	Units	60223187001		1798942		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result						
Chloride	mg/L	44.2	25	25	69.7	68.6	102	98	80-120	2	15
Sulfate	mg/L	61.0	25	25	85.2	84.7	97	95	80-120	1	15

MATRIX SPIKE SAMPLE: 1798943

Parameter	Units	60223195001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	26.0	10	35.1	91	80-120	
Sulfate	mg/L	431	250	677	98	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch:	439703	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60223199005		

METHOD BLANK: 1798953 Matrix: Water  
Associated Lab Samples: 60223199005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	07/23/16 17:58	

LABORATORY CONTROL SAMPLE: 1798954

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	10	9.6	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1798955 1798956

Parameter	Units	60223196001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	65.1	25	25	89.3	89.0	97	96	80-120	0	15	

MATRIX SPIKE SAMPLE: 1798957

Parameter	Units	60223199002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	36.5	25	61.0	98	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-UG-3**      **Lab ID: 60223187001**      Collected: 07/08/16 12:44      Received: 07/09/16 04:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0785 ± 0.358 (0.578)</b> <b>C:NA T:88%</b>	pCi/L	08/03/16 22:01	13982-63-3	
Radium-228	EPA 904.0	<b>0.462 ± 0.362 (0.711)</b> <b>C:76% T:83%</b>	pCi/L	08/03/16 16:39	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-TMW-1**      **Lab ID: 60223187004**      Collected: 07/08/16 09:00      Received: 07/09/16 04:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.293 (0.472)</b> <b>C:NA T:98%</b>	pCi/L	08/03/16 22:14	13982-63-3	
Radium-228	EPA 904.0	<b>0.748 ± 0.391 (0.679)</b> <b>C:74% T:89%</b>	pCi/L	08/03/16 16:39	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-TMW-2**      **Lab ID: 60223187005**      Collected: 07/08/16 09:57      Received: 07/09/16 04:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0653 ± 0.298 (0.481)</b> <b>C:NA T:94%</b>	pCi/L	08/03/16 22:01	13982-63-3	
Radium-228	EPA 904.0	<b>0.387 ± 0.331 (0.658)</b> <b>C:75% T:86%</b>	pCi/L	08/03/16 16:39	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.203 ± 0.399 (0.730)</b> C:NA T:92%	pCi/L	08/03/16 22:14	13982-63-3	
Radium-228	EPA 904.0	<b>0.357 ± 0.314 (0.623)</b> C:75% T:85%	pCi/L	08/03/16 16:39	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-UWL-FB-1**      **Lab ID: 60223187007**      Collected: 07/08/16 15:25      Received: 07/09/16 04:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.333 (0.538)</b> <b>C:NA T:84%</b>	pCi/L	08/03/16 22:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.398 ± 0.379 (0.772)</b> <b>C:71% T:82%</b>	pCi/L	08/03/16 16:39	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.065 ± 0.456 (0.969)</b> C:NA T:91%	pCi/L	08/03/16 13:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.936 ± 0.431 (0.716)</b> C:73% T:87%	pCi/L	08/01/16 16:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

**Sample: S-BMW-1S**      **Lab ID: 60223195005**      Collected: 07/05/16 13:28      Received: 07/09/16 04:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.228 ± 0.365 (0.826)</b> <b>C:NA T:96%</b>	pCi/L	08/03/16 23:30	13982-63-3	
Radium-228	EPA 904.0	<b>0.233 ± 0.470 (1.01)</b> <b>C:65% T:76%</b>	pCi/L	08/02/16 15:39	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227775

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60223199005

METHOD BLANK: 1115881

Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.722 ± 0.380 (0.655) C:77% T:78%	pCi/L	08/01/16 16:24	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227780

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60223195005

METHOD BLANK: 1115889

Matrix: Water

Associated Lab Samples: 60223195005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0123 ± 0.433 (0.985) C:69% T:80%	pCi/L	08/02/16 15:38	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227767

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60223199005

METHOD BLANK: 1115871

Matrix: Water

Associated Lab Samples: 60223199005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.254 ± 0.291 (0.762) C:NA T:95%	pCi/L	08/03/16 12:45	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227862

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60223195005

METHOD BLANK: 1116131

Matrix: Water

Associated Lab Samples: 60223195005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.168 ± 0.467 (0.906) C:NA T:84%	pCi/L	08/03/16 13:42	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227866

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

METHOD BLANK: 1116138

Matrix: Water

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.300 ± 0.581 (0.947) C:NA T:86%	pCi/L	08/03/16 14:28	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

QC Batch: 227838

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

METHOD BLANK: 1116105

Matrix: Water

Associated Lab Samples: 60223187001, 60223187004, 60223187005, 60223187006, 60223187007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.107 ± 0.269 (0.603) C:80% T:87%	pCi/L	08/03/16 13:18	

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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without the written consent of Pace Analytical Services, LLC.

## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

---

### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60223187001	S-UG-3	EPA 200.7	438181	EPA 200.7	438270
60223187004	S-TMW-1	EPA 200.7	438181	EPA 200.7	438270
60223187005	S-TMW-2	EPA 200.7	438181	EPA 200.7	438270
60223187006	S-TMW-3	EPA 200.7	438181	EPA 200.7	438270
60223187007	S-UWL-FB-1	EPA 200.7	438181	EPA 200.7	438270
60223195005	S-BMW-1S	EPA 200.7	438181	EPA 200.7	438270
60223199005	S-UWL-DUP-1	EPA 200.7	438289	EPA 200.7	438335
60223187001	S-UG-3	EPA 200.8	438182	EPA 200.8	438271
60223187004	S-TMW-1	EPA 200.8	438182	EPA 200.8	438271
60223187005	S-TMW-2	EPA 200.8	438182	EPA 200.8	438271
60223187006	S-TMW-3	EPA 200.8	438182	EPA 200.8	438271
60223187007	S-UWL-FB-1	EPA 200.8	438182	EPA 200.8	438271
60223195005	S-BMW-1S	EPA 200.8	438182	EPA 200.8	438271
60223199005	S-UWL-DUP-1	EPA 200.8	438290	EPA 200.8	438336
60223187001	S-UG-3	EPA 7470	438034	EPA 7470	438049
60223187004	S-TMW-1	EPA 7470	438034	EPA 7470	438049
60223187005	S-TMW-2	EPA 7470	438034	EPA 7470	438049
60223187006	S-TMW-3	EPA 7470	438034	EPA 7470	438049
60223187007	S-UWL-FB-1	EPA 7470	438034	EPA 7470	438049
60223195005	S-BMW-1S	EPA 7470	438034	EPA 7470	438049
60223199005	S-UWL-DUP-1	EPA 7470	438036	EPA 7470	438050
60223187001	S-UG-3	EPA 903.1	227866		
60223187004	S-TMW-1	EPA 903.1	227866		
60223187005	S-TMW-2	EPA 903.1	227866		
60223187006	S-TMW-3	EPA 903.1	227866		
60223187007	S-UWL-FB-1	EPA 903.1	227866		
60223195005	S-BMW-1S	EPA 903.1	227862		
60223199005	S-UWL-DUP-1	EPA 903.1	227767		
60223187001	S-UG-3	EPA 904.0	227838		
60223187004	S-TMW-1	EPA 904.0	227838		
60223187005	S-TMW-2	EPA 904.0	227838		
60223187006	S-TMW-3	EPA 904.0	227838		
60223187007	S-UWL-FB-1	EPA 904.0	227838		
60223195005	S-BMW-1S	EPA 904.0	227780		
60223199005	S-UWL-DUP-1	EPA 904.0	227775		
60223187001	S-UG-3	SM 2540C	438659		
60223187004	S-TMW-1	SM 2540C	438659		
60223187005	S-TMW-2	SM 2540C	438659		
60223187006	S-TMW-3	SM 2540C	438659		
60223187007	S-UWL-FB-1	SM 2540C	438659		
60223195005	S-BMW-1S	SM 2540C	438032		
60223199005	S-UWL-DUP-1	SM 2540C	438069		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-UWL

Pace Project No.: 60223187

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60223187001	S-UG-3	SM 4500-H+B	437871		
60223187004	S-TMW-1	SM 4500-H+B	437871		
60223187005	S-TMW-2	SM 4500-H+B	437871		
60223187006	S-TMW-3	SM 4500-H+B	437871		
60223187007	S-UWL-FB-1	SM 4500-H+B	437871		
60223195005	S-BMW-1S	SM 4500-H+B	437868		
60223199005	S-UWL-DUP-1	SM 4500-H+B	437870		
60223187001	S-UG-3	EPA 300.0	439322		
60223187001	S-UG-3	EPA 300.0	439702		
60223187004	S-TMW-1	EPA 300.0	439322		
60223187004	S-TMW-1	EPA 300.0	439702		
60223187005	S-TMW-2	EPA 300.0	439322		
60223187005	S-TMW-2	EPA 300.0	439702		
60223187006	S-TMW-3	EPA 300.0	439322		
60223187006	S-TMW-3	EPA 300.0	439702		
60223187007	S-UWL-FB-1	EPA 300.0	439322		
60223195005	S-BMW-1S	EPA 300.0	439322		
60223195005	S-BMW-1S	EPA 300.0	439702		
60223199005	S-UWL-DUP-1	EPA 300.0	439323		
60223199005	S-UWL-DUP-1	EPA 300.0	439703		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60223187  
60223187

Client Name: Golden Associates

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client   
Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

Optional  
Proj Due Date:  
Proj Name:

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: CF +1.1 T-266 CF -0.1 T-239 Type of Ice: Wet Blue  None  Samples received on ice, cooling process has begun.  
Cooler Temperature: 1.0 27.0 (circle one)

Date and initials of person examining contents: JB 7/9

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>pk</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses Matrix:	<u>WT</u>	13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
\_\_\_\_\_ Jamie Church \_\_\_\_\_ 7/11/16 \_\_\_\_\_

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_







**Sample Condition Upon Receipt**

**WO# : 60223199**



60223199

Client Name: Golden Associates

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: CF +1.1 T-266 / CF -0.1 T-239 Type of Ice: Wet Blue  None  Samples received on ice, cooling process has begun.

Cooler Temperature: 1.0 24.2

Optional
Proj Due Date:
Proj Name:

Date and initials of person examining contents: JB 7/9

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses Matrix: <u>WT</u>		13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Project Manager Review: Jami Church Date: 7/11/16



# CHAIN-OF-CUSTODY / Analytical Request Document

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

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: <b>Golder Associates</b>	Report To: <b>Mark Haddock (mhaddock@golder.com)</b>	Attention:		Company Name:	
Address: <b>820 South Main Street, Suite 100</b>	Copy To: <b>Jeffrey Ingram</b>	Address:		REGULATORY AGENCY	
St Charles, MO 63301	Purchase Order No.:	Pace Quote Reference:		<input type="checkbox"/> NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Email To: <b>mhaddock@golder.com</b>	Project Name: <b>Ameren Sioux Energy Center - UWL</b>	Pace Project Manager: <b>Jamie Church</b>		Site Location	
Phone: <b>636-724-9191</b>	Project Number: <b>153-1406.0003B</b>	Pace Profile #: <b>9285</b>		STATE: <b>MO</b>	
Requested Due Date/TAT: <b>Standard</b>					

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP AR OT TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> O <sub>3</sub> Methanol Other	Analysis Test ↑	Metals*	Chloride/Fluoride/Sulfate	pH	Radium 226 & 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB										
1	<del>S-IMM-1</del>	WT G												
2	<del>C-IMM-2</del>	WT G												
3	<del>C-IMM-3</del>	WT G												
4	S-UG-1A	WT G	7/17/16	0905		4	1	3						60023199
5	<del>S-UG-2</del>	WT G												
6	<del>S-UG-3</del>	WT G												
7	S-DG-1	WT G	7/17/16	1355		12	3	9						
8	S-DG-2	WT G	7/17/16	1555		4	1	3						
9	S-DG-3	WT G	7/17/16	1644		4	1	3						
10	<del>S-DG-4</del>	WT G												
11	S-UWL-DUP-1	WT G	7/17/16			4	1	3						
12	<del>S-UWL-FB-1</del>	WT G												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		DATE	TIME	DATE	TIME	SAMPLE CONDITIONS										
	DATE	TIME	DATE	TIME						DATE	TIME								
EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 1470A Hg EPA 200.8: Sb, As, Cd, Cr, Se, Tl					7/18/16	11:37			7/18/16	11:57									
					7/19/16	17:00			7/19/16	09:45									

Temp in °C

Received on

Cooler (Y/N)

Samples In tact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **John Sorelli**

SIGNATURE of SAMPLER: *John Sorelli*

DATE Signed (MM/DD/YYYY): **7/17/16**



**Sample Condition Upon Receipt**

**WO# : 60223195**  
  
 60223195

Client Name: Golden Associates

Courier: FedEx  UPS  VIA  Clay  PEX  ECI  Pace  Other  Client

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: CF +1.1 T-266 / CF -0.1 T-239 Type of Ice: Wet Blue  None  Samples received on ice, cooling process has begun. (circle one)

Cooler Temperature: 1.2 25.2

Temperature should be above freezing to 6°C

Optional
Proj Due Date:
Proj Name:

Date and initials of person examining contents: <u>JG 7/9</u>
---

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses Matrix: <u>WT</u>		13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Lot # of added preservative
Pace Trip Blank lot # (if purchased):		15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_  
 \_\_\_\_\_ 7/11/16

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_



# CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

**Section A**  
 Required Client Information:  
 Company: Golder Associates  
 Address: 820 South Main Street, Suite 100  
 St Charles, MO 63301  
 Email To: maddock@golder.com  
 Phone: 636-724-9191 Fax: 636-724-9323  
 Requested Due Date/TAT: Standard

**Section B**  
 Required Project Information:  
 Repair To: Mark Haddock (mhaddock@golder.com)  
 Copy To: Jeffrey Ingram  
 Purchase Order No.:  
 Project Name: Ameren Sioux Energy Center - Fly Ash  
 Project Number: 153-1406.0003B

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: Jamie Church  
 Pace Profile #: 9285  
 MO

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER

Site Location: MO  
 STATE:

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP AR OT TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑	Requested Analysis Filtered (Y/N)												Residual Chlorine (Y/N)	Pace Project No. / Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB					DATE	TIME	Y	N	N	N	N	N	N	N	N	N		
1	S-LMW-1S	WT G			7/5/16 1415	12	H <sub>2</sub> SO <sub>4</sub>	3	Metals*	3	Chloride/Fluoride/Sulfate	3	TDS	3	pH	9	Radium 226 & 228	561522009				
2	S-LMW-2S	WT G			7/16/16 1254	4	Unpreserved	1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
3	<del>S-LMW-3S</del>	WT G																318726 (3007) (6) BAPIN				
4	<del>S-LMW-4S</del>	WT G			7/15/16 1411	4		1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
5	S-LMW-5S	WT G			7/16/16 1517	4		1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
6	S-LMW-6S	WT G																				
7	<del>S-LMW-7S</del>	WT G																				
8	<del>S-LMW-8S</del>	WT G																				
9	<del>S-LMW-9S</del>	WT G			7/5/16 1328	4		1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
10	S-BMW-1S	WT G			7/5/16 1535	4		1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
11	S-BMW-2S	WT G			7/16/16	4		1	Metals*	1	Chloride/Fluoride/Sulfate	1	TDS	1	pH	3		318726 (3007) (6) BAPIN				
12	S-LMW-DUP-1	WT G																				

**RELIQUISHED BY / AFFILIATION** DATE TIME ACCEPTED BY / AFFILIATION DATE TIME

John Snopce / Golder 7/8/16 1137 W. Haddock 7/8/16 1137  
 W. Haddock 7/8-16 1700 J. S. 7/9 0445

**ADDITIONAL COMMENTS**  
 \*EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg  
 EPA 200.8: Sb, As, Cd, Cr, Se, Tl

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

112 Y Y Y  
 252 N Y Y

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: W. Haddock  
 SIGNATURE of SAMPLER: W. Haddock  
 DATE Signed (MM/DD/YY): 7/7/16

# CHAIN-OF-CUSTODY / Analytical Request Document

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



Page: 2 of 2

<b>Section A</b> Required Client Information:		<b>Section B</b> Required Project Information:		<b>Section C</b> Invoice Information:	
Company: Golder Associates	Report To: Mark Haddock (mhaddock@golder.com)	Copy To: Jeffrey Ingram	Company Name:	Attention:	
Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Purchase Order No.:	Project Name: Ameren Sioux Energy Center - Fly Ash	Address:		
Email To: mhaddock@golder.com	Project Number: 153-1406.0003B	Project Manager: Jamie Church	Pace Quote Reference:	Site Location	MO
Phone: 636-724-9191 Fax: 636-724-9323		Pace Profile #: 9285		Requested Analysis Filtered (Y/N)	
Requested Due Date/TAT: Standard					

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW LIQUID LQ SOLID SOLID OIL OIL	SAMPLE TYPE (G-GRAB C-COMP)	COLLECTED		PRESERVATIVES	ANALYSIS TEST ↑	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB				
	MATRIX CODE (see valid codes to left)		DATE	TIME				
1	S-LMW-DUP-2	WT G	7/18/13	13:40	Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Metals* Chloride/Fluoride/Sulfate TDS pH Radium 226 & 228		
2	S-LMW-FB-1	WT G						
3	S-LMW-FB-2	WT G						
4								
5								
6								
7								
8								
9								
10								
11								
12								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		SAMPLE CONDITIONS		
	DATE	TIME	DATE	TIME	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Samples were analyzed by Golder 7/18/13 13:40. I PASSED 7/18/13 1:57. I PASSED 7/19 8:00 AM 1:2. 7/19 8:00 AM 2:52.	7/18/13	13:40	7/18/13	1:57	Y	Y	Y
					N	Y	Y

<b>SAMPLER NAME AND SIGNATURE</b>	
PRINT Name of SAMPLER: John Swartz	DATE Signed (MM/DD/YYYY): 7/17/16
SIGNATURE of SAMPLER: <i>[Signature]</i>	

January 30, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261460

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on September 16, 2016. 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.

REV-1, 1/30/18: Radium pulled in for S-UWL-DUP-1, S-UWL-FB-1 and S-BMW-1S

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60227580009	S-TMW-1	Water	09/15/16 10:30	09/16/16 04:30
60227580010	S-TMW-2	Water	09/15/16 09:30	09/16/16 04:30
60227580011	S-TMW-3	Water	09/15/16 08:30	09/16/16 04:30
60227580014	S-UG-3	Water	09/15/16 12:13	09/16/16 04:30
60227899014	S-TMW-3 MS	Water	09/15/16 08:30	09/16/16 04:30
60227899015	S-TMW-3 MSD	Water	09/15/16 08:30	09/16/16 04:30
60227580019	S-UWL-DUP-1	Water	09/15/16 08:00	09/16/16 04:30
60227580020	S-UWL-FB-1	Water	09/15/16 11:55	09/16/16 04:30
60227402019	S-BMW-1S	Water	09/14/16 12:03	09/16/16 04:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60227580009	S-TMW-1	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
60227580010	S-TMW-2	EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
60227580011	S-TMW-3	SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP, SMW	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60227580014	S-UG-3	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60227899014	S-TMW-3 MS	EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60227899015	S-TMW-3 MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60227580019	S-UWL-DUP-1	EPA 200.7	TDS	8	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
<b>60227580020</b>	<b>S-UWL-FB-1</b>	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
<b>60227402019</b>	<b>S-BMW-1S</b>	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-1**      **Lab ID: 60227580009**      Collected: 09/15/16 10:30      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>188</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:22	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:22	7440-41-7	
Boron	<b>73.7J</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:22	7440-42-8	
Calcium	<b>97300</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:22	7440-70-2	
Cobalt	<b>1.6J</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:22	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:22	7439-92-1	
Lithium	<b>23.6</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:22	7439-93-2	
Molybdenum	<b>3.9J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:22	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.16J</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 17:52	7440-36-0	
Arsenic	<b>0.46J</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 17:52	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 17:52	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 17:52	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 17:52	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 17:52	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 12:50	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>390</b>	mg/L	5.0	5.0	1		09/22/16 16:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.2</b>	mg/L	1.0	0.50	1		10/08/16 09:50	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.027	1		10/08/16 09:50	16984-48-8	
Sulfate	<b>35.8</b>	mg/L	5.0	0.77	5		10/09/16 19:44	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-2**      **Lab ID: 60227580010**      Collected: 09/15/16 09:30      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>226</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:24	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:24	7440-41-7	
Boron	<b>80.7J</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:24	7440-42-8	
Calcium	<b>118000</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:24	7440-70-2	
Cobalt	<b>1.9J</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:24	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:24	7439-92-1	
Lithium	<b>29.4</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:24	7439-93-2	
Molybdenum	<b>2.4J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:24	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 17:55	7440-36-0	
Arsenic	<b>6.2</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 17:55	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 17:55	7440-43-9	
Chromium	<b>0.53J</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 17:55	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 17:55	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 17:55	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 12:52	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>450</b>	mg/L	5.0	5.0	1		09/22/16 16:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.6</b>	mg/L	1.0	0.50	1		10/08/16 10:32	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.027	1		10/08/16 10:32	16984-48-8	
Sulfate	<b>31.3</b>	mg/L	2.0	0.31	2		10/09/16 19:31	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-3**      **Lab ID: 60227580011**      Collected: 09/15/16 08:30      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>206</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:26	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:26	7440-41-7	
Boron	<b>85.8J</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:26	7440-42-8	
Calcium	<b>123000</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:26	7440-70-2	
Cobalt	<b>1.6J</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:26	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:26	7439-92-1	
Lithium	<b>31.0</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:26	7439-93-2	
Molybdenum	<b>3.6J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:26	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.063J</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/30/16 11:43	7440-36-0	
Arsenic	<b>2.8</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/30/16 11:43	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/30/16 11:43	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/30/16 11:43	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:20	10/03/16 12:10	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/30/16 11:43	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 12:54	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>492</b>	mg/L	5.0	5.0	1		09/22/16 16:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.7</b>	mg/L	1.0	0.50	1		10/08/16 11:28	16887-00-6	
Fluoride	<b>0.22</b>	mg/L	0.20	0.027	1		10/08/16 11:28	16984-48-8	
Sulfate	<b>57.5</b>	mg/L	5.0	0.77	5		10/09/16 20:42	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-UG-3**      **Lab ID: 60227580014**      Collected: 09/15/16 12:13      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>205</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:37	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:37	7440-41-7	
Boron	<b>342</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:37	7440-42-8	
Calcium	<b>106000</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:37	7440-70-2	
Cobalt	<b>3.3J</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:37	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:37	7439-92-1	
Lithium	<b>25.6</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:37	7439-93-2	
Molybdenum	<b>3.1J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:37	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.20J</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 18:14	7440-36-0	
Arsenic	<b>0.28J</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 18:14	7440-38-2	
Cadmium	<b>0.18J</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 18:14	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 18:14	7440-47-3	
Selenium	<b>2.1</b>	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 18:14	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 18:14	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 13:05	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>492</b>	mg/L	5.0	5.0	1		09/22/16 16:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.3</b>	Std. Units	0.10	0.10	1		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>40.8</b>	mg/L	5.0	2.5	5		10/09/16 21:38	16887-00-6	
Fluoride	<b>0.28</b>	mg/L	0.20	0.027	1		10/08/16 12:25	16984-48-8	
Sulfate	<b>53.5</b>	mg/L	5.0	0.77	5		10/09/16 21:38	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-UWL-DUP-1**      **Lab ID: 60227580019**      Collected: 09/15/16 08:00      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>223</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:53	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:53	7440-41-7	
Boron	<b>80.1J</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:53	7440-42-8	
Calcium	<b>116000</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:53	7440-70-2	
Cobalt	<b>1.4J</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:53	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:53	7439-92-1	
Lithium	<b>28.7</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:53	7439-93-2	
Molybdenum	<b>2.4J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:53	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 18:39	7440-36-0	
Arsenic	<b>5.6</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 18:39	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 18:39	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 18:39	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 18:39	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 18:39	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 13:21	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>435</b>	mg/L	5.0	5.0	1		09/22/16 16:48		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		09/23/16 11:25		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.6</b>	mg/L	1.0	0.50	1		10/08/16 13:22	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.027	1		10/08/16 13:22	16984-48-8	
Sulfate	<b>31.4</b>	mg/L	2.0	0.31	2		10/09/16 23:03	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-UWL-FB-1**      **Lab ID: 60227580020**      Collected: 09/15/16 11:55      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<0.58	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 14:56	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 14:56	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 14:56	7440-42-8	
Calcium	19.3J	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 14:56	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 14:56	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 14:56	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 14:56	7439-93-2	
Molybdenum	<0.52	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 14:56	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<0.058	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 18:24	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 18:24	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 18:24	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 18:24	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 18:24	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 18:24	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<0.039	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 13:23	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		09/22/16 16:50		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	3.3	Std. Units	0.10	0.10	1		09/25/16 20:20		H6

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-BMW-1S**      **Lab ID: 60227402019**      Collected: 09/14/16 12:03      Received: 09/16/16 04:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>199</b>	ug/L	10.0	0.58	1	09/19/16 16:20	09/20/16 15:14	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:20	09/20/16 15:14	7440-41-7	
Boron	<b>165</b>	ug/L	100	50.0	1	09/19/16 16:20	09/20/16 15:14	7440-42-8	
Calcium	<b>124000</b>	ug/L	100	8.1	1	09/19/16 16:20	09/20/16 15:14	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:20	09/20/16 15:14	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:20	09/20/16 15:14	7439-92-1	
Lithium	<b>21.0</b>	ug/L	10.0	4.9	1	09/19/16 16:20	09/20/16 15:14	7439-93-2	
Molybdenum	<b>2.7J</b>	ug/L	20.0	0.52	1	09/19/16 16:20	09/20/16 15:14	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.16J</b>	ug/L	1.0	0.058	1	09/19/16 16:20	09/29/16 19:08	7440-36-0	
Arsenic	<b>0.38J</b>	ug/L	1.0	0.10	1	09/19/16 16:20	09/29/16 19:08	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:20	09/29/16 19:08	7440-43-9	
Chromium	<b>0.53J</b>	ug/L	1.0	0.34	1	09/19/16 16:20	09/29/16 19:08	7440-47-3	
Selenium	<b>5.5</b>	ug/L	1.0	0.18	1	09/19/16 16:20	09/29/16 19:08	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:20	09/29/16 19:08	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	09/20/16 08:30	09/20/16 13:38	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>565</b>	mg/L	5.0	5.0	1		09/21/16 16:01		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		09/23/16 11:25		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.9</b>	mg/L	1.0	0.50	1		10/08/16 16:40	16887-00-6	
Fluoride	<b>0.16J</b>	mg/L	0.20	0.027	1		10/08/16 16:40	16984-48-8	
Sulfate	<b>23.4</b>	mg/L	2.0	0.31	2		10/10/16 00:28	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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QC Batch: 447159 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

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METHOD BLANK: 1828989 Matrix: Water  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	09/20/16 12:45	

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LABORATORY CONTROL SAMPLE: 1828990

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	92	80-120	

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MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828991 1828992

Parameter	Units	60227580011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.039	5	5	4.8	4.3	96	87	75-125	10	20	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 447058 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

METHOD BLANK: 1828802 Matrix: Water  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	0.95J	5.0	0.58	09/20/16 14:17	
Beryllium	ug/L	<0.26	1.0	0.26	09/20/16 14:17	
Boron	ug/L	<50.0	100	50.0	09/20/16 14:17	
Calcium	ug/L	<8.1	100	8.1	09/20/16 14:17	
Cobalt	ug/L	<0.72	5.0	0.72	09/20/16 14:17	
Lead	ug/L	<2.5	5.0	2.5	09/20/16 14:17	
Lithium	ug/L	<4.9	10.0	4.9	09/20/16 14:17	
Molybdenum	ug/L	<0.52	20.0	0.52	09/20/16 14:17	

LABORATORY CONTROL SAMPLE: 1828803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Beryllium	ug/L	1000	995	100	85-115	
Boron	ug/L	1000	953	95	85-115	
Calcium	ug/L	10000	9710	97	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	989	99	85-115	
Molybdenum	ug/L	1000	1060	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828804 1828805

Parameter	Units	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		60227580011 Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec				
Barium	ug/L	206	1000	1000	1220	1220	102	102	70-130	0	20	
Beryllium	ug/L	<0.26	1000	1000	1000	1000	100	100	70-130	0	20	
Boron	ug/L	85.8J	1000	1000	1070	1080	99	100	70-130	1	20	
Calcium	ug/L	123000	10000	10000	134000	133000	111	105	70-130	0	20	
Cobalt	ug/L	1.6J	1000	1000	993	994	99	99	70-130	0	20	
Lead	ug/L	<2.5	1000	1000	992	993	99	99	70-130	0	20	
Lithium	ug/L	31.0	1000	1000	1060	1050	102	102	70-130	0	20	
Molybdenum	ug/L	3.6J	1000	1000	1070	1070	107	107	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

MATRIX SPIKE SAMPLE: 1828806		60227402016	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Barium	ug/L	139	1000	1160	102	70-130	
Beryllium	ug/L	<0.26	1000	998	100	70-130	
Boron	ug/L	11000	1000	12000	101	70-130	
Calcium	ug/L	182000	10000	193000	110	70-130	
Cobalt	ug/L	5.1	1000	999	99	70-130	
Lead	ug/L	2.5J	1000	992	99	70-130	
Lithium	ug/L	30.8	1000	1070	104	70-130	
Molybdenum	ug/L	1160	1000	2210	106	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 447057 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

METHOD BLANK: 1828797 Matrix: Water  
 Associated Lab Samples: 60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	09/29/16 17:46	
Arsenic	ug/L	<0.10	1.0	0.10	09/29/16 17:46	
Cadmium	ug/L	<0.029	0.50	0.029	09/29/16 17:46	
Chromium	ug/L	<0.34	1.0	0.34	09/29/16 17:46	
Selenium	ug/L	<0.18	1.0	0.18	09/29/16 17:46	
Thallium	ug/L	<0.50	1.0	0.50	09/29/16 17:46	

LABORATORY CONTROL SAMPLE: 1828798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.1	100	85-115	
Arsenic	ug/L	40	39.9	100	85-115	
Cadmium	ug/L	40	40.2	101	85-115	
Chromium	ug/L	40	41.4	103	85-115	
Selenium	ug/L	40	39.6	99	85-115	
Thallium	ug/L	40	38.0	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828799 1828800

Parameter	Units	60227580011		60227580010		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony	ug/L	0.063J	40	40	39.6	39.4	99	98	70-130	1	20	
Arsenic	ug/L	2.8	40	40	44.1	44.1	103	103	70-130	0	20	
Cadmium	ug/L	<0.029	40	40	38.8	38.5	97	96	70-130	1	20	
Chromium	ug/L	<0.34	40	40	40.6	40.4	101	100	70-130	1	20	
Selenium	ug/L	<0.18	40	40	39.0	38.8	97	97	70-130	0	20	
Thallium	ug/L	<0.50	40	40	40.4	40.2	101	101	70-130	0	20	

MATRIX SPIKE SAMPLE: 1828801

Parameter	Units	60227580019 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.058	40	40.6	102	70-130	
Arsenic	ug/L	5.6	40	47.0	103	70-130	
Cadmium	ug/L	<0.029	40	39.3	98	70-130	
Chromium	ug/L	<0.34	40	41.1	102	70-130	
Selenium	ug/L	<0.18	40	37.8	94	70-130	
Thallium	ug/L	<0.50	40	40.4	101	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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QC Batch: 447478	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60227402019	

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METHOD BLANK: 1830494 Matrix: Water

Associated Lab Samples: 60227402019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	09/21/16 15:57	

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LABORATORY CONTROL SAMPLE: 1830495

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

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SAMPLE DUPLICATE: 1830496

Parameter	Units	60227580017 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	580	575	1	10	

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SAMPLE DUPLICATE: 1830497

Parameter	Units	60227403022 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	506	494	2	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 447622

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

METHOD BLANK: 1831069

Matrix: Water

Associated Lab Samples: 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	09/22/16 16:45	

LABORATORY CONTROL SAMPLE: 1831070

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1040	104	80-120	

SAMPLE DUPLICATE: 1831071

Parameter	Units	60227580011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	492	477	3	10	

SAMPLE DUPLICATE: 1831072

Parameter	Units	60227580020 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<5.0	<5.0		10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 447611 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60227402019, 60227580019

SAMPLE DUPLICATE: 1831033

Parameter	Units	60227720002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 447879 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60227580009, 60227580010, 60227580011, 60227580014, 60227580020

SAMPLE DUPLICATE: 1832508

Parameter	Units	60227580011 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 449694 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60227580009, 60227580010, 60227580011, 60227580014, 60227580019

METHOD BLANK: 1840308 Matrix: Water  
 Associated Lab Samples: 60227580009, 60227580010, 60227580011, 60227580014, 60227580019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	10/08/16 09:08	
Fluoride	mg/L	<0.027	0.20	0.027	10/08/16 09:08	

LABORATORY CONTROL SAMPLE: 1840309

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840310 1840311

Parameter	Units	60227580009		1840310		1840311		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Chloride	mg/L	3.2	5	5	7.8	8.1	92	98	80-120	3	15
Fluoride	mg/L	0.26	2.5	2.5	2.6	2.7	94	99	80-120	5	15

MATRIX SPIKE SAMPLE: 1840312

Parameter	Units	60227580011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.7	5	6.3	91	80-120	
Fluoride	mg/L	0.22	2.5	2.6	93	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 449695

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60227402019

METHOD BLANK: 1840314

Matrix: Water

Associated Lab Samples: 60227402019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	10/08/16 14:04	
Fluoride	mg/L	<0.027	0.20	0.027	10/08/16 14:04	

LABORATORY CONTROL SAMPLE: 1840315

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.3	90	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840316 1840317

Parameter	Units	60227402015		1840317		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Fluoride	mg/L	0.18J	2.5	2.5	2.6	2.7	98	101	80-120	3	15	

MATRIX SPIKE SAMPLE: 1840318

Parameter	Units	60227402016 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.35	2.5	2.8	97	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 449709

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60227580009

METHOD BLANK: 1840640

Matrix: Water

Associated Lab Samples: 60227580009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	10/09/16 09:59	

LABORATORY CONTROL SAMPLE: 1840641

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840642 1840643

Parameter	Units	60228562001		1840642		1840643		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Sulfate	mg/L	111	50	50	161	162	101	103	80-120	1	15

MATRIX SPIKE SAMPLE: 1840644

Parameter	Units	60228563001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	871	500	1380	101	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 449710 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60227402019, 60227580010, 60227580011, 60227580014, 60227580019

METHOD BLANK: 1840645 Matrix: Water  
 Associated Lab Samples: 60227402019, 60227580010, 60227580011, 60227580014, 60227580019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	10/09/16 19:03	
Sulfate	mg/L	<0.15	1.0	0.15	10/09/16 19:03	

LABORATORY CONTROL SAMPLE: 1840646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840647 1840648

Parameter	Units	60227580010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	31.3	10	10	40.0	39.9	87	86	80-120	0	15	

MATRIX SPIKE SAMPLE: 1840649

Parameter	Units	60227580011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	57.5	25	84.2	107	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-1**      **Lab ID: 60227580009**      Collected: 09/15/16 10:30      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.105 ± 0.254 (0.490)</b> C:NA T:97%	pCi/L	10/05/16 19:56	13982-63-3	
Radium-228	EPA 904.0	<b>0.446 ± 0.432 (0.888)</b> C:70% T:86%	pCi/L	10/05/16 11:57	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-2**      **Lab ID: 60227580010**      Collected: 09/15/16 09:30      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.432 ± 0.338 (0.397)</b> C:NA T:90%	pCi/L	10/05/16 19:56	13982-63-3	
Radium-228	EPA 904.0	<b>0.452 ± 0.374 (0.750)</b> C:76% T:83%	pCi/L	10/05/16 11:57	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-3**      **Lab ID: 60227580011**      Collected: 09/15/16 08:30      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.301 ± 0.314 (0.443)</b> <b>C:NA T:87%</b>	pCi/L	10/05/16 20:25	13982-63-3	
Radium-228	EPA 904.0	<b>0.0724 ± 0.432 (0.978)</b> <b>C:73% T:85%</b>	pCi/L	10/05/16 11:58	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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**Sample: S-UG-3**                      **Lab ID: 60227580014**    Collected: 09/15/16 12:13    Received: 09/16/16 04:30    Matrix: Water  
PWS:                                      Site ID:                                      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0576 ± 0.263 (0.535)</b> <b>C:NA T:88%</b>	pCi/L	10/05/16 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.665 ± 0.446 (0.836)</b> <b>C:64% T:85%</b>	pCi/L	10/05/16 12:05	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-3 MS**      **Lab ID: 60227899014**      Collected: 09/15/16 08:30      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>108.9%REC ± NA (NA)</b>	pCi/L	10/05/16 20:47	13982-63-3	
Radium-228	EPA 904.0	<b>87.8 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	10/05/16 12:01	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-TMW-3 MSD**      **Lab ID: 60227899015**      Collected: 09/15/16 08:30      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>90.2%REC 30.4RPD ± NA (NA)</b>	pCi/L	10/05/16 20:57	13982-63-3	
Radium-228	EPA 904.0	<b>97.0 %REC 9.97 RPD +/- NA (NA) C:NA T:NA</b>	pCi/L	10/05/16 12:02	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.268 ± 0.317 (0.498)</b> C:NA T:93%	pCi/L	10/05/16 20:48	13982-63-3	
Radium-228	EPA 904.0	<b>0.286 ± 0.341 (0.719)</b> C:71% T:88%	pCi/L	10/05/16 12:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.058 ± 0.264 (0.538)</b> C:NA T:91%	pCi/L	10/05/16 20:46	13982-63-3	
Radium-228	EPA 904.0	<b>0.307 ± 0.378 (0.799)</b> C:66% T:83%	pCi/L	10/05/16 12:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

**Sample: S-BMW-1S**      **Lab ID: 60227402019**      Collected: 09/14/16 12:03      Received: 09/16/16 04:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.207 ± 0.287 (0.480)</b> C:NA T:95%	pCi/L	10/05/16 21:49	13982-63-3	
Radium-228	EPA 904.0	<b>0.223 ± 0.300 (0.640)</b> C:78% T:85%	pCi/L	10/05/16 12:01	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 234076

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples:

METHOD BLANK: 1147973

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.359 ± 0.332 (0.672) C:68% T:89%	pCi/L	10/05/16 12:05	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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QC Batch:	234075	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020, 60227899014, 60227899015		

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METHOD BLANK:	1147972	Matrix:	Water
Associated Lab Samples:	60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020, 60227899014, 60227899015		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0637 ± 0.339 (0.773) C:69% T:93%	pCi/L	10/05/16 11:57	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

QC Batch: 234072

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples:

METHOD BLANK: 1147966

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.054 ± 0.247 (0.581) C:NA T:97%	pCi/L	10/05/16 22:22	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

---

QC Batch:	234070	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020, 60227899014, 60227899015		

---

METHOD BLANK:	1147941	Matrix:	Water
Associated Lab Samples:	60227402019, 60227580009, 60227580010, 60227580011, 60227580014, 60227580019, 60227580020, 60227899014, 60227899015		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.176 ± 0.345 (0.630) C:NA T:91%	pCi/L	10/05/16 19:55	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227580009	S-TMW-1	EPA 200.7	447058	EPA 200.7	447184
60227580010	S-TMW-2	EPA 200.7	447058	EPA 200.7	447184
60227580011	S-TMW-3	EPA 200.7	447058	EPA 200.7	447184
60227580014	S-UG-3	EPA 200.7	447058	EPA 200.7	447184
60227580019	S-UWL-DUP-1	EPA 200.7	447058	EPA 200.7	447184
60227580020	S-UWL-FB-1	EPA 200.7	447058	EPA 200.7	447184
60227402019	S-BMW-1S	EPA 200.7	447058	EPA 200.7	447184
60227580009	S-TMW-1	EPA 200.8	447057	EPA 200.8	447185
60227580010	S-TMW-2	EPA 200.8	447057	EPA 200.8	447185
60227580011	S-TMW-3	EPA 200.8	447057	EPA 200.8	447185
60227580014	S-UG-3	EPA 200.8	447057	EPA 200.8	447185
60227580019	S-UWL-DUP-1	EPA 200.8	447057	EPA 200.8	447185
60227580020	S-UWL-FB-1	EPA 200.8	447057	EPA 200.8	447185
60227402019	S-BMW-1S	EPA 200.8	447057	EPA 200.8	447185
60227580009	S-TMW-1	EPA 7470	447159	EPA 7470	447212
60227580010	S-TMW-2	EPA 7470	447159	EPA 7470	447212
60227580011	S-TMW-3	EPA 7470	447159	EPA 7470	447212
60227580014	S-UG-3	EPA 7470	447159	EPA 7470	447212
60227580019	S-UWL-DUP-1	EPA 7470	447159	EPA 7470	447212
60227580020	S-UWL-FB-1	EPA 7470	447159	EPA 7470	447212
60227402019	S-BMW-1S	EPA 7470	447159	EPA 7470	447212
60227580009	S-TMW-1	EPA 903.1	234070		
60227580010	S-TMW-2	EPA 903.1	234070		
60227580011	S-TMW-3	EPA 903.1	234070		
60227580014	S-UG-3	EPA 903.1	234070		
60227580019	S-UWL-DUP-1	EPA 903.1	234070		
60227580020	S-UWL-FB-1	EPA 903.1	234070		
60227402019	S-BMW-1S	EPA 903.1	234070		
60227899014	S-TMW-3 MS	EPA 903.1	234070		
60227899015	S-TMW-3 MSD	EPA 903.1	234070		
60227580009	S-TMW-1	EPA 904.0	234075		
60227580010	S-TMW-2	EPA 904.0	234075		
60227580011	S-TMW-3	EPA 904.0	234075		
60227580014	S-UG-3	EPA 904.0	234075		
60227580019	S-UWL-DUP-1	EPA 904.0	234075		
60227580020	S-UWL-FB-1	EPA 904.0	234075		
60227402019	S-BMW-1S	EPA 904.0	234075		
60227899014	S-TMW-3 MS	EPA 904.0	234075		
60227899015	S-TMW-3 MSD	EPA 904.0	234075		
60227580009	S-TMW-1	SM 2540C	447622		
60227580010	S-TMW-2	SM 2540C	447622		
60227580011	S-TMW-3	SM 2540C	447622		
60227580014	S-UG-3	SM 2540C	447622		
60227580019	S-UWL-DUP-1	SM 2540C	447622		
60227580020	S-UWL-FB-1	SM 2540C	447622		
60227402019	S-BMW-1S	SM 2540C	447478		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227580009	S-TMW-1	SM 4500-H+B	447879		
60227580010	S-TMW-2	SM 4500-H+B	447879		
60227580011	S-TMW-3	SM 4500-H+B	447879		
60227580014	S-UG-3	SM 4500-H+B	447879		
60227580019	S-UWL-DUP-1	SM 4500-H+B	447611		
60227580020	S-UWL-FB-1	SM 4500-H+B	447879		
60227402019	S-BMW-1S	SM 4500-H+B	447611		
60227580009	S-TMW-1	EPA 300.0	449694		
60227580009	S-TMW-1	EPA 300.0	449709		
60227580010	S-TMW-2	EPA 300.0	449694		
60227580010	S-TMW-2	EPA 300.0	449710		
60227580011	S-TMW-3	EPA 300.0	449694		
60227580011	S-TMW-3	EPA 300.0	449710		
60227580014	S-UG-3	EPA 300.0	449694		
60227580014	S-UG-3	EPA 300.0	449710		
60227580019	S-UWL-DUP-1	EPA 300.0	449694		
60227580019	S-UWL-DUP-1	EPA 300.0	449710		
60227402019	S-BMW-1S	EPA 300.0	449695		
60227402019	S-BMW-1S	EPA 300.0	449710		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60227899



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.6 Corr. Factor CF +0.7 / CF -0.5 Corrected 1.3

Date and initials of person examining contents:

PV 10/21/16

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO <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)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Cyanide water sample checks:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Chook \_\_\_\_\_ 11/4/16 \_\_\_\_\_

Date: \_\_\_\_\_







Sample Condition Upon Receipt

Co-227901  
WO#: 60227402  
60227402  
COC # 3  
2/14/14

Client Name: Goldy

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 <sup>CF +1.1</sup> T-239 <sup>CF -0.1</sup> Type of Ice: WSP Blue None

Cooler Temperature (°C): As-read 0.6, 13.6 Corr. Factor <sup>CF +1.1</sup> <sup>CF -0.1</sup> Corrected 1.9, 14.7

Date and initials of person examining contents: JFS 9/14/14

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>water</u>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_





January 29, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261461

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 09, 2016 and November 18, 2016. 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.

REV-1, 1/29/18: Radium results pulled in for S-BMW-1S, S-BMW-3S, S-UWL-DUP-1 and S-UWL-FB-1

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60232056001	S-TMW-1	Water	11/09/16 08:32	11/11/16 04:00
60232056002	S-TMW-2	Water	11/09/16 09:21	11/11/16 04:00
60232056003	S-TMW-3	Water	11/09/16 10:37	11/11/16 04:00
60232056006	S-UG-3	Water	11/09/16 13:15	11/11/16 04:00
60232056011	S-UWL-DUP-1	Water	11/09/16 08:00	11/11/16 04:00
60232056012	S-UWL-FB-1	Water	11/09/16 17:15	11/11/16 04:00
60231804008	S-BMW-1S	Water	11/07/16 09:05	11/09/16 04:20
60232580001	S-BMW-3S	Water	11/17/16 12:50	11/18/16 03:35

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60232056001	S-TMW-1	EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60232056002	S-TMW-2	EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
60232056003	S-TMW-3	SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60232056006	S-UG-3	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
60232056011	S-UWL-DUP-1	EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60232056012	S-UWL-FB-1	SM 2540C	LDB	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	ZBM	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDB	1	PASI-K
60231804008	S-BMW-1S	SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60232580001	S-BMW-3S	EPA 300.0	OL	3	PASI-K
		EPA 200.7	NDJ	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-TMW-1**      **Lab ID: 60232056001**      Collected: 11/09/16 08:32      Received: 11/11/16 04:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>195</b>	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:06	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:06	7440-41-7	
Boron	<b>75.5J</b>	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:06	7440-42-8	
Calcium	<b>104000</b>	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:06	7440-70-2	
Cobalt	<b>2.1J</b>	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:06	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:06	7439-92-1	
Lithium	<b>25.8</b>	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:06	7439-93-2	
Molybdenum	<b>2.5J</b>	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:06	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.18J</b>	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 19:54	7440-36-0	
Arsenic	<b>0.32J</b>	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 19:54	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 19:54	7440-43-9	
Chromium	<b>0.57J</b>	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 19:54	7440-47-3	
Selenium	<b>0.34J</b>	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 19:54	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 19:54	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 11:34	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>483</b>	mg/L	5.0	5.0	1		11/16/16 16:52		D6
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		11/14/16 06:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.8</b>	mg/L	1.0	0.50	1		12/03/16 16:46	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.027	1		12/03/16 16:46	16984-48-8	
Sulfate	<b>32.5</b>	mg/L	5.0	0.77	5		12/04/16 10:51	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-TMW-2**      **Lab ID: 60232056002**      Collected: 11/09/16 09:21      Received: 11/11/16 04:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>215</b>	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:08	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:08	7440-41-7	
Boron	<b>82.1J</b>	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:08	7440-42-8	
Calcium	<b>118000</b>	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:08	7440-70-2	
Cobalt	<b>1.3J</b>	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:08	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:08	7439-92-1	
Lithium	<b>30.6</b>	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:08	7439-93-2	
Molybdenum	<b>2.3J</b>	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:08	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 19:58	7440-36-0	
Arsenic	<b>5.6</b>	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 19:58	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 19:58	7440-43-9	
Chromium	<b>0.62J</b>	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 19:58	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 19:58	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 19:58	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 11:37	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>415</b>	mg/L	5.0	5.0	1		11/16/16 16:54		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		11/14/16 06:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.0</b>	mg/L	1.0	0.50	1		12/03/16 17:27	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		12/03/16 17:27	16984-48-8	
Sulfate	<b>30.0</b>	mg/L	5.0	0.77	5		12/04/16 12:41	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Sample: S-TMW-3 Lab ID: 60232056003 Collected: 11/09/16 10:37 Received: 11/11/16 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	223	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:11	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:11	7440-41-7	
Boron	81.7J	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:11	7440-42-8	
Calcium	127000	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:11	7440-70-2	
Cobalt	1.3J	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:11	7440-48-4	
Lead	3.1J	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:11	7439-92-1	
Lithium	31.6	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:11	7439-93-2	
Molybdenum	3.4J	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:11	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.068J	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 20:02	7440-36-0	
Arsenic	2.1	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 20:02	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 20:02	7440-43-9	
Chromium	0.56J	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 20:02	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 20:02	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 20:02	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.039	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 11:39	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	465	mg/L	5.0	5.0	1		11/16/16 16:54		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1	Std. Units	0.10	0.10	1		11/14/16 06:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	1.7	mg/L	1.0	0.50	1		12/03/16 17:41	16887-00-6	
Fluoride	0.27	mg/L	0.20	0.027	1		12/03/16 17:41	16984-48-8	
Sulfate	52.5	mg/L	5.0	0.77	5		12/04/16 12:57	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-UG-3**      **Lab ID: 60232056006**      Collected: 11/09/16 13:15      Received: 11/11/16 04:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>207</b>	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:22	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:22	7440-41-7	
Boron	<b>275</b>	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:22	7440-42-8	
Calcium	<b>107000</b>	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:22	7440-70-2	
Cobalt	<b>6.1</b>	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:22	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:22	7439-92-1	
Lithium	<b>26.8</b>	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:22	7439-93-2	
Molybdenum	<b>3.4J</b>	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:22	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.21J</b>	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 20:16	7440-36-0	
Arsenic	<b>0.35J</b>	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 20:16	7440-38-2	
Cadmium	<b>0.29J</b>	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 20:16	7440-43-9	
Chromium	<b>0.50J</b>	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 20:16	7440-47-3	
Selenium	<b>2.4</b>	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 20:16	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 20:16	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 11:46	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>426</b>	mg/L	5.0	5.0	1		11/16/16 16:56		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		11/14/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>28.9</b>	mg/L	5.0	2.5	5		12/04/16 14:01	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		12/03/16 18:23	16984-48-8	
Sulfate	<b>47.4</b>	mg/L	5.0	0.77	5		12/04/16 14:01	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-UWL-DUP-1**      **Lab ID: 60232056011**      Collected: 11/09/16 08:00      Received: 11/11/16 04:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>204</b>	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:38	7440-39-3	
Beryllium	<b>0.42J</b>	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:38	7440-41-7	
Boron	<b>277</b>	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:38	7440-42-8	
Calcium	<b>107000</b>	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:38	7440-70-2	
Cobalt	<b>5.4</b>	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:38	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:38	7439-92-1	
Lithium	<b>27.5</b>	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:38	7439-93-2	
Molybdenum	<b>4.2J</b>	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:38	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.19J</b>	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 21:08	7440-36-0	
Arsenic	<b>0.32J</b>	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 21:08	7440-38-2	
Cadmium	<b>0.29J</b>	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 21:08	7440-43-9	
Chromium	<b>0.54J</b>	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 21:08	7440-47-3	
Selenium	<b>2.6</b>	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 21:08	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 21:08	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 12:06	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>457</b>	mg/L	5.0	5.0	1		11/16/16 16:58		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		11/14/16 06:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>29.1</b>	mg/L	5.0	2.5	5		12/04/16 16:08	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		12/03/16 20:14	16984-48-8	
Sulfate	<b>47.9</b>	mg/L	5.0	0.77	5		12/04/16 16:08	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-UWL-FB-1**      **Lab ID: 60232056012**      Collected: 11/09/16 17:15      Received: 11/11/16 04:00      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>0.61J</b>	ug/L	5.0	0.58	1	11/11/16 16:15	11/14/16 13:43	7440-39-3	
Beryllium	<b>0.37J</b>	ug/L	1.0	0.26	1	11/11/16 16:15	11/14/16 13:43	7440-41-7	
Boron	<b>&lt;50.0</b>	ug/L	100	50.0	1	11/11/16 16:15	11/14/16 13:43	7440-42-8	
Calcium	<b>66.2J</b>	ug/L	100	8.1	1	11/11/16 16:15	11/14/16 13:43	7440-70-2	B
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/11/16 16:15	11/14/16 13:43	7440-48-4	
Lead	<b>2.6J</b>	ug/L	5.0	2.5	1	11/11/16 16:15	11/14/16 13:43	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	11/11/16 16:15	11/14/16 13:43	7439-93-2	
Molybdenum	<b>0.99J</b>	ug/L	20.0	0.52	1	11/11/16 16:15	11/14/16 13:43	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	11/11/16 16:15	11/22/16 20:42	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	11/11/16 16:15	11/22/16 20:42	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/11/16 16:15	11/22/16 20:42	7440-43-9	
Chromium	<b>0.64J</b>	ug/L	1.0	0.34	1	11/11/16 16:15	11/22/16 20:42	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/11/16 16:15	11/22/16 20:42	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/11/16 16:15	11/22/16 20:42	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/23/16 08:35	11/23/16 12:08	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>&lt;5.0</b>	mg/L	5.0	5.0	1		11/16/16 16:58		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.4</b>	Std. Units	0.10	0.10	1		11/14/16 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>&lt;0.50</b>	mg/L	1.0	0.50	1		12/03/16 20:28	16887-00-6	
Fluoride	<b>&lt;0.027</b>	mg/L	0.20	0.027	1		12/03/16 20:28	16984-48-8	
Sulfate	<b>&lt;0.15</b>	mg/L	1.0	0.15	1		12/03/16 20:28	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-BMW-1S**      **Lab ID: 60231804008**      Collected: 11/07/16 09:05      Received: 11/09/16 04:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>139</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 14:10	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 14:10	7440-41-7	
Boron	<b>107</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 14:10	7440-42-8	
Calcium	<b>151000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 14:10	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 14:10	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 14:10	7439-92-1	
Lithium	<b>7.4J</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 14:10	7439-93-2	
Molybdenum	<b>2.7J</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 14:10	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.084J</b>	ug/L	1.0	0.058	1	11/09/16 17:00	11/22/16 15:08	7440-36-0	
Arsenic	<b>0.91J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 15:08	7440-38-2	
Cadmium	<b>0.10J</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 15:08	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 15:08	7440-47-3	
Selenium	<b>0.18J</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 15:08	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 15:08	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	11/17/16 15:00	11/18/16 11:53	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>540</b>	mg/L	5.0	5.0	1		11/10/16 11:25		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		11/12/16 11:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.2</b>	mg/L	1.0	0.50	1		11/18/16 23:11	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.027	1		11/18/16 23:11	16984-48-8	
Sulfate	<b>34.8</b>	mg/L	2.0	0.31	2		11/19/16 20:24	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-BMW-3S**      **Lab ID: 60232580001**      Collected: 11/17/16 12:50      Received: 11/18/16 03:35      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>194</b>	ug/L	5.0	0.58	1	11/18/16 16:30	11/23/16 14:39	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/18/16 16:30	11/23/16 14:39	7440-41-7	
Boron	<b>65.4J</b>	ug/L	100	50.0	1	11/18/16 16:30	11/23/16 14:39	7440-42-8	
Calcium	<b>124000</b>	ug/L	100	8.1	1	11/18/16 16:30	11/23/16 14:39	7440-70-2	
Cobalt	<b>2.0J</b>	ug/L	5.0	0.72	1	11/18/16 16:30	11/23/16 14:39	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/18/16 16:30	11/23/16 14:39	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	11/18/16 16:30	11/23/16 14:39	7439-93-2	
Molybdenum	<b>6.3J</b>	ug/L	20.0	0.52	1	11/18/16 16:30	11/23/16 14:39	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.36J</b>	ug/L	1.0	0.058	1	11/18/16 16:30	11/30/16 16:27	7440-36-0	B
Arsenic	<b>1.0</b>	ug/L	1.0	0.10	1	11/18/16 16:30	12/01/16 18:17	7440-38-2	
Cadmium	<b>0.056J</b>	ug/L	0.50	0.029	1	11/18/16 16:30	11/30/16 16:27	7440-43-9	B
Chromium	<b>0.50J</b>	ug/L	1.0	0.34	1	11/18/16 16:30	11/30/16 16:27	7440-47-3	
Selenium	<b>0.23J</b>	ug/L	1.0	0.18	1	11/18/16 16:30	11/30/16 16:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/18/16 16:30	11/30/16 16:27	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>0.043J</b>	ug/L	0.20	0.039	1	11/28/16 16:30	11/29/16 11:52	7439-97-6	B
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>438</b>	mg/L	5.0	5.0	1		11/23/16 15:29		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		11/30/16 16:23		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.1</b>	mg/L	1.0	0.50	1		12/09/16 10:34	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.027	1		12/09/16 10:34	16984-48-8	
Sulfate	<b>28.2</b>	mg/L	2.0	0.31	2		12/12/16 01:04	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455411 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60231804008

METHOD BLANK: 1864691 Matrix: Water  
 Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	11/18/16 11:24	

LABORATORY CONTROL SAMPLE: 1864692

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1864693 1864694

Parameter	Units	60231804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.039	5	5	5.2	5.1	104	101	75-125	3	20	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 456114 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1867553 Matrix: Water  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	11/23/16 11:30	

LABORATORY CONTROL SAMPLE: 1867554

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1867555 1867556

Parameter	Units	60232056010		1867555		1867556		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Mercury	ug/L	<0.039	5	5	5.3	5.0	105	100	75-125	5	20

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch:	456625	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
Associated Lab Samples:	60232580001		

METHOD BLANK: 1869658 Matrix: Water

Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	0.045J	0.20	0.039	11/29/16 10:56	

LABORATORY CONTROL SAMPLE: 1869659

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.8	115	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1869660 1869661

Parameter	Units	60232589004		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	0.044J	5	5	5.5	5.8	110	115	75-125	4	20				

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454175 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60231804008

METHOD BLANK: 1859682 Matrix: Water  
 Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	11/11/16 13:06	
Beryllium	ug/L	<0.26	1.0	0.26	11/11/16 13:06	
Boron	ug/L	<50.0	100	50.0	11/11/16 13:06	
Calcium	ug/L	32.2J	100	8.1	11/11/16 13:06	
Cobalt	ug/L	<0.72	5.0	0.72	11/11/16 13:06	
Lead	ug/L	<2.5	5.0	2.5	11/11/16 13:06	
Lithium	ug/L	<4.9	10.0	4.9	11/11/16 13:06	
Molybdenum	ug/L	0.94J	20.0	0.52	11/11/16 13:06	

LABORATORY CONTROL SAMPLE: 1859683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	983	98	85-115	
Beryllium	ug/L	1000	1000	100	85-115	
Boron	ug/L	1000	1000	100	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	980	98	85-115	
Molybdenum	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859684 1859685

Parameter	Units	60231802004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MSD Result	% Rec	% Rec					
Barium	ug/L	72.0	1000	1000	1040	1050	97	98	70-130	1	20		
Beryllium	ug/L	<0.26	1000	1000	988	992	99	99	70-130	0	20		
Boron	ug/L	24600	1000	1000	25100	25200	42	52	70-130	0	20	M1	
Calcium	ug/L	186000	10000	10000	190000	189000	46	30	70-130	1	20	M1	
Cobalt	ug/L	<0.72	1000	1000	986	1000	99	100	70-130	2	20		
Lead	ug/L	5.6	1000	1000	977	993	97	99	70-130	2	20		
Lithium	ug/L	41.3	1000	1000	1020	1040	98	99	70-130	1	20		
Molybdenum	ug/L	7190	1000	1000	8020	8100	83	90	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Parameter	Units	MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859686		1859687		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60231804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Barium	ug/L	72.8	1000	1000	1050	1060	98	98	70-130	0	20		
Beryllium	ug/L	<0.26	1000	1000	990	998	99	100	70-130	1	20		
Boron	ug/L	1380	1000	1000	2400	2410	103	103	70-130	0	20		
Calcium	ug/L	87400	10000	10000	97200	98300	97	108	70-130	1	20		
Cobalt	ug/L	0.81J	1000	1000	1000	1010	100	101	70-130	1	20		
Lead	ug/L	<2.5	1000	1000	1000	1020	100	102	70-130	1	20		
Lithium	ug/L	17.9	1000	1000	1010	1010	99	99	70-130	0	20		
Molybdenum	ug/L	65.0	1000	1000	1130	1140	106	108	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454620 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1861718 Matrix: Water  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	11/14/16 13:04	
Beryllium	ug/L	<0.26	1.0	0.26	11/14/16 13:04	
Boron	ug/L	<50.0	100	50.0	11/14/16 13:04	
Calcium	ug/L	18.4J	100	8.1	11/14/16 13:04	
Cobalt	ug/L	<0.72	5.0	0.72	11/14/16 13:04	
Lead	ug/L	<2.5	5.0	2.5	11/14/16 13:04	
Lithium	ug/L	<4.9	10.0	4.9	11/14/16 13:04	
Molybdenum	ug/L	0.65J	20.0	0.52	11/14/16 13:04	

LABORATORY CONTROL SAMPLE: 1861719

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	921	92	85-115	
Beryllium	ug/L	1000	926	93	85-115	
Boron	ug/L	1000	885	89	85-115	
Calcium	ug/L	10000	9320	93	85-115	
Cobalt	ug/L	1000	920	92	85-115	
Lead	ug/L	1000	933	93	85-115	
Lithium	ug/L	1000	917	92	85-115	
Molybdenum	ug/L	1000	948	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1861720 1861721

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Barium	ug/L	256	1000	1000	1190	93	98	70-130	4	20	
Beryllium	ug/L	<0.26	1000	1000	955	95	100	70-130	5	20	
Boron	ug/L	79.5J	1000	1000	1010	93	97	70-130	4	20	
Calcium	ug/L	126000	10000	10000	132000	67	91	70-130	2	20 M1	
Cobalt	ug/L	<0.72	1000	1000	911	91	96	70-130	5	20	
Lead	ug/L	<2.5	1000	1000	917	92	96	70-130	5	20	
Lithium	ug/L	41.4	1000	1000	1000	96	101	70-130	5	20	
Molybdenum	ug/L	1.5J	1000	1000	974	97	102	70-130	5	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

MATRIX SPIKE SAMPLE:		1861722					
Parameter	Units	60232056011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	204	1000	1160	95	70-130	
Beryllium	ug/L	0.42J	1000	976	98	70-130	
Boron	ug/L	277	1000	1220	95	70-130	
Calcium	ug/L	107000	10000	115000	79	70-130	
Cobalt	ug/L	5.4	1000	942	94	70-130	
Lead	ug/L	<2.5	1000	945	94	70-130	
Lithium	ug/L	27.5	1000	1000	97	70-130	
Molybdenum	ug/L	4.2J	1000	1000	100	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455694 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60232580001

METHOD BLANK: 1865875 Matrix: Water  
Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	11/23/16 14:35	
Beryllium	ug/L	<0.26	1.0	0.26	11/23/16 14:35	
Boron	ug/L	<50.0	100	50.0	11/23/16 14:35	
Calcium	ug/L	<8.1	100	8.1	11/23/16 14:35	
Cobalt	ug/L	<0.72	5.0	0.72	11/23/16 14:35	
Lead	ug/L	<2.5	5.0	2.5	11/23/16 14:35	
Lithium	ug/L	<4.9	10.0	4.9	11/23/16 14:35	
Molybdenum	ug/L	<0.52	20.0	0.52	11/23/16 14:35	

LABORATORY CONTROL SAMPLE: 1865876

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1000	100	85-115	
Beryllium	ug/L	1000	983	98	85-115	
Boron	ug/L	1000	979	98	85-115	
Calcium	ug/L	10000	9840	98	85-115	
Cobalt	ug/L	1000	1020	102	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	993	99	85-115	
Molybdenum	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1865877 1865878

Parameter	Units	60232589004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Barium	ug/L	256	1000	1000	1260	1280	100	103	70-130	2	20		
Beryllium	ug/L	<0.26	1000	1000	1000	1020	100	102	70-130	2	20		
Boron	ug/L	4450	1000	1000	5380	5440	93	98	70-130	1	20		
Calcium	ug/L	69700	10000	10000	78200	79200	85	95	70-130	1	20		
Cobalt	ug/L	<0.72	1000	1000	1010	1020	101	102	70-130	1	20		
Lead	ug/L	<2.5	1000	1000	991	1010	99	101	70-130	2	20		
Lithium	ug/L	39.9	1000	1000	1050	1070	101	103	70-130	2	20		
Molybdenum	ug/L	109	1000	1000	1170	1190	106	108	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

MATRIX SPIKE SAMPLE:		1865879					
Parameter	Units	60232589006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	166	1000	1150	99	70-130	
Beryllium	ug/L	<0.26	1000	995	99	70-130	
Boron	ug/L	1820	1000	2800	97	70-130	
Calcium	ug/L	90200	10000	98700	85	70-130	
Cobalt	ug/L	<0.72	1000	1000	100	70-130	
Lead	ug/L	<2.5	1000	998	100	70-130	
Lithium	ug/L	<4.9	1000	998	100	70-130	
Molybdenum	ug/L	1.0J	1000	1060	106	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261461

QC Batch: 454179 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60231804008

METHOD BLANK: 1859707 Matrix: Water  
Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	11/22/16 13:10	
Arsenic	ug/L	<0.10	1.0	0.10	11/22/16 13:10	
Cadmium	ug/L	<0.029	0.50	0.029	11/22/16 13:10	
Chromium	ug/L	<0.34	1.0	0.34	11/22/16 13:10	
Selenium	ug/L	<0.18	1.0	0.18	11/22/16 13:10	
Thallium	ug/L	<0.50	1.0	0.50	11/22/16 13:10	

LABORATORY CONTROL SAMPLE: 1859708

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.9	97	85-115	
Arsenic	ug/L	40	38.8	97	85-115	
Cadmium	ug/L	40	39.1	98	85-115	
Chromium	ug/L	40	40.2	100	85-115	
Selenium	ug/L	40	38.3	96	85-115	
Thallium	ug/L	40	40.1	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859709 1859710

Parameter	Units	60231802004		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec			
Antimony	ug/L	<0.058	40	40	39.2	37.6	98	94	70-130	4	20	
Arsenic	ug/L	0.18J	40	40	39.6	36.9	99	92	70-130	7	20	
Cadmium	ug/L	0.13J	40	40	38.1	36.3	95	90	70-130	5	20	
Chromium	ug/L	0.34J	40	40	39.7	37.3	98	92	70-130	6	20	
Selenium	ug/L	0.22J	40	40	37.2	34.8	92	86	70-130	7	20	
Thallium	ug/L	<0.50	40	40	41.3	40.0	103	100	70-130	3	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1859711 1859712

Parameter	Units	60231804001		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec			
Antimony	ug/L	0.35J	40	40	37.0	32.8	92	81	70-130	12	20	
Arsenic	ug/L	1.8	40	40	38.3	34.8	91	83	70-130	9	20	
Cadmium	ug/L	0.044J	40	40	35.6	32.0	89	80	70-130	11	20	
Chromium	ug/L	0.47J	40	40	37.0	32.8	91	81	70-130	12	20	
Selenium	ug/L	1.8	40	40	35.2	32.6	84	77	70-130	8	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Parameter	Units	1859711		1859712		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60231804001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Thallium	ug/L	<0.50	40	40	37.6	33.6	94	84	70-130	11	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454621 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1861723 Matrix: Water  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	11/22/16 19:45	
Arsenic	ug/L	<0.10	1.0	0.10	11/22/16 19:45	
Cadmium	ug/L	<0.029	0.50	0.029	11/22/16 19:45	
Chromium	ug/L	<0.34	1.0	0.34	11/22/16 19:45	
Selenium	ug/L	<0.18	1.0	0.18	11/22/16 19:45	
Thallium	ug/L	<0.50	1.0	0.50	11/22/16 19:45	

LABORATORY CONTROL SAMPLE: 1861724

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.3	101	85-115	
Arsenic	ug/L	40	40.3	101	85-115	
Cadmium	ug/L	40	40.1	100	85-115	
Chromium	ug/L	40	40.7	102	85-115	
Selenium	ug/L	40	39.7	99	85-115	
Thallium	ug/L	40	38.8	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1861725 1861726

Parameter	Units	60232056010		60232056012		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Antimony	ug/L	0.11J	40	40	37.2	38.5	93	96	70-130	3	20
Arsenic	ug/L	0.44J	40	40	37.5	38.4	93	95	70-130	2	20
Cadmium	ug/L	0.089J	40	40	35.9	37.0	90	92	70-130	3	20
Chromium	ug/L	0.62J	40	40	38.4	38.9	94	96	70-130	1	20
Selenium	ug/L	9.1	40	40	41.9	42.6	82	84	70-130	2	20
Thallium	ug/L	<0.50	40	40	35.9	37.2	90	93	70-130	4	20

MATRIX SPIKE SAMPLE: 1861727

Parameter	Units	60232056012 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.058	40	37.6	94	70-130	
Arsenic	ug/L	<0.10	40	37.8	94	70-130	
Cadmium	ug/L	<0.029	40	38.1	95	70-130	
Chromium	ug/L	0.64J	40	38.9	96	70-130	
Selenium	ug/L	<0.18	40	36.8	92	70-130	
Thallium	ug/L	<0.50	40	37.5	94	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455691 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60232580001

METHOD BLANK: 1865866 Matrix: Water

Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.18J	1.0	0.058	11/30/16 16:14	
Arsenic	ug/L	<0.10	1.0	0.10	12/01/16 17:55	
Cadmium	ug/L	0.046J	0.50	0.029	11/30/16 16:14	
Chromium	ug/L	<0.34	1.0	0.34	11/30/16 16:14	
Selenium	ug/L	<0.18	1.0	0.18	11/30/16 16:14	
Thallium	ug/L	<0.50	1.0	0.50	11/30/16 16:14	

LABORATORY CONTROL SAMPLE: 1865867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.8	105	85-115	
Arsenic	ug/L	40	39.4	98	85-115	
Cadmium	ug/L	40	40.4	101	85-115	
Chromium	ug/L	40	41.4	103	85-115	
Selenium	ug/L	40	39.5	99	85-115	
Thallium	ug/L	40	38.1	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1865868 1865869

Parameter	Units	60232589004		60232589005		60232589006		60232589007		% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Antimony	ug/L	0.18J	40	40	42.4	42.0	106	105	70-130	1	20	
Arsenic	ug/L	6.4	40	40	47.1	45.0	102	96	70-130	4	20	
Cadmium	ug/L	0.032J	40	40	39.6	39.3	99	98	70-130	1	20	
Chromium	ug/L	0.57J	40	40	42.1	40.8	104	101	70-130	3	20	
Selenium	ug/L	<0.18	40	40	38.1	37.6	95	94	70-130	1	20	
Thallium	ug/L	<0.50	40	40	40.6	39.9	101	100	70-130	2	20	

MATRIX SPIKE SAMPLE: 1865870

Parameter	Units	60232589005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.20J	40	42.0	105	70-130	
Arsenic	ug/L	4.3	40	46.9	106	70-130	
Cadmium	ug/L	0.048J	40	39.5	99	70-130	
Chromium	ug/L	0.51J	40	41.7	103	70-130	
Selenium	ug/L	<0.18	40	38.4	96	70-130	
Thallium	ug/L	<0.50	40	40.3	101	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454266

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60231804008

METHOD BLANK: 1860122

Matrix: Water

Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/10/16 11:13	

LABORATORY CONTROL SAMPLE: 1860123

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	955	96	80-120	

SAMPLE DUPLICATE: 1860124

Parameter	Units	60231747006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	644	643	0	10	

SAMPLE DUPLICATE: 1860125

Parameter	Units	60231802004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1020	1030	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455196

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1863882

Matrix: Water

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/16/16 16:51	

LABORATORY CONTROL SAMPLE: 1863883

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	980	98	80-120	

SAMPLE DUPLICATE: 1863884

Parameter	Units	60232056001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	483	393	21	10	D6

SAMPLE DUPLICATE: 1863885

Parameter	Units	60232056010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	563	589	5	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 456308

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60232580001

METHOD BLANK: 1868508

Matrix: Water

Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/23/16 15:12	

LABORATORY CONTROL SAMPLE: 1868509

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

SAMPLE DUPLICATE: 1867313

Parameter	Units	60232589004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	406	395	3	10	

SAMPLE DUPLICATE: 1868510

Parameter	Units	60232503004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5280	5400	2	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454662 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60231804008

SAMPLE DUPLICATE: 1862079

Parameter	Units	60231501003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	4.8	4.8	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454700 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056011

SAMPLE DUPLICATE: 1862312

Parameter	Units	60231857001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.6	6.6	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 454701 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60232056006, 60232056012

SAMPLE DUPLICATE: 1862313

Parameter	Units	60231930001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.3	0	5	H6

SAMPLE DUPLICATE: 1862314

Parameter	Units	60232056010 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.1	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 457036 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60232580001

SAMPLE DUPLICATE: 1871119

Parameter	Units	60232598006 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.8	7.8	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455675	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60231804008	

METHOD BLANK: 1865810 Matrix: Water  
Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	11/18/16 17:23	
Fluoride	mg/L	<0.027	0.20	0.027	11/18/16 17:23	

LABORATORY CONTROL SAMPLE: 1865811

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1865812 1865813

Parameter	Units	60231802004		1865812		1865813		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	0.78	2.5	2.5	3.6	3.6	112	114	80-120	1	15

MATRIX SPIKE SAMPLE: 1865814

Parameter	Units	60231804001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.26	2.5	3.2	116	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 455761

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60231804008

METHOD BLANK: 1866337

Matrix: Water

Associated Lab Samples: 60231804008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	11/19/16 08:46	

LABORATORY CONTROL SAMPLE: 1866338

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1866339 1866340

Parameter	Units	60231802004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Sulfate	mg/L	600	250	250	836	837	94	95	80-120	0	15		

MATRIX SPIKE SAMPLE: 1866341

Parameter	Units	60231804001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	115	50	167	103	80-120	

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### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 457499 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1873085 Matrix: Water  
 Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/03/16 15:50	
Fluoride	mg/L	<0.027	0.20	0.027	12/03/16 15:50	
Sulfate	mg/L	<0.15	1.0	0.15	12/03/16 15:50	

LABORATORY CONTROL SAMPLE: 1873086

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.7	107	90-110	
Sulfate	mg/L	5	5.3	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1873087 1873088

Parameter	Units	60232056001		1873088		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MS Result	MSD Result	% Rec	% Rec						
Chloride	mg/L	2.8	5	8.4	8.5	113	114	80-120	1	15			
Fluoride	mg/L	0.31	2.5	3.3	3.3	118	120	80-120	1	15			

MATRIX SPIKE SAMPLE: 1873089

Parameter	Units	60232056010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.33	2.5	3.2	115	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 457514

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011

METHOD BLANK: 1873336

Matrix: Water

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/04/16 08:38	
Sulfate	mg/L	<0.15	1.0	0.15	12/04/16 08:38	

LABORATORY CONTROL SAMPLE: 1873337

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1873338 1873339

Parameter	Units	60232613001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	707	250	250	1170	978	185	108	80-120	18	15	M1,R1	
Sulfate	mg/L	293	250	250	628	556	134	105	80-120	12	15	M1	

MATRIX SPIKE SAMPLE: 1873346

Parameter	Units	60232056010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	64.1	25	95.2	124	80-120	M1
Sulfate	mg/L	31.5	25	59.4	112	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 458214	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60232580001	

METHOD BLANK: 1875991 Matrix: Water  
Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/09/16 08:34	
Fluoride	mg/L	<0.027	0.20	0.027	12/09/16 08:34	

LABORATORY CONTROL SAMPLE: 1875992

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1875993 1875994

Parameter	Units	60232579001		1875993		1875994		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MSD Result	MSD Spike Conc.				
Chloride	mg/L	8.5	5	5	5	14.6	14.6	122	121	0	15 M1
Fluoride	mg/L	0.28	2.5	2.5	2.5	3.3	3.3	122	122	1	15 M1

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch:	458452	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60232580001		

METHOD BLANK: 1876996 Matrix: Water  
Associated Lab Samples: 60232580001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	12/11/16 17:25	

LABORATORY CONTROL SAMPLE: 1876997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE SAMPLE: 1877000

Parameter	Units	60232361003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	89.9	50	155	130	80-120	M1

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-TMW-1**      **Lab ID: 60232056001**      Collected: 11/09/16 08:32      Received: 11/11/16 04:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.383 ± 0.310 (0.173)</b> <b>C:NA T:94%</b>	pCi/L	12/12/16 10:25	13982-63-3	
Radium-228	EPA 904.0	<b>0.739 ± 0.430 (0.783)</b> <b>C:64% T:86%</b>	pCi/L	12/12/16 11:57	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-TMW-2**      **Lab ID: 60232056002**      Collected: 11/09/16 09:21      Received: 11/11/16 04:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0642 ± 0.293 (0.473)</b> <b>C:NA T:93%</b>	pCi/L	12/12/16 10:25	13982-63-3	
Radium-228	EPA 904.0	<b>0.637 ± 0.385 (0.694)</b> <b>C:64% T:85%</b>	pCi/L	12/12/16 11:58	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-TMW-3**      **Lab ID: 60232056003**      Collected: 11/09/16 10:37      Received: 11/11/16 04:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.254 ± 0.292 (0.172)</b> <b>C:NA T:87%</b>	pCi/L	12/12/16 10:46	13982-63-3	
Radium-228	EPA 904.0	<b>0.780 ± 0.387 (0.652)</b> <b>C:68% T:87%</b>	pCi/L	12/12/16 11:58	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-UG-3**      **Lab ID: 60232056006**      Collected: 11/09/16 13:15      Received: 11/11/16 04:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.526 ± 0.370 (0.178)</b> <b>C:NA T:88%</b>	pCi/L	12/12/16 10:58	13982-63-3	
Radium-228	EPA 904.0	<b>1.02 ± 0.459 (0.740)</b> <b>C:72% T:77%</b>	pCi/L	12/12/16 15:40	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-UWL-DUP-1**      **Lab ID: 60232056011**      Collected: 11/09/16 08:00      Received: 11/11/16 04:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.789 ± 0.524 (0.611)</b> <b>C:NA T:88%</b>	pCi/L	12/12/16 11:00	13982-63-3	
Radium-228	EPA 904.0	<b>1.08 ± 0.414 (0.598)</b> <b>C:79% T:85%</b>	pCi/L	12/12/16 15:41	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-UWL-FB-1</b> <b>Lab ID: 60232056012</b> Collected: 11/09/16 17:15      Received: 11/11/16 04:00      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>0.129 ± 0.311 (0.601)</b> <b>C:NA T:88%</b>	pCi/L	12/12/16 11:00	13982-63-3	
Radium-228	EPA 904.0	<b>0.925 ± 0.472 (0.823)</b> <b>C:75% T:75%</b>	pCi/L	12/12/16 15:41	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

**Sample: S-BMW-1S**      **Lab ID: 60231804008**      Collected: 11/07/16 09:05      Received: 11/09/16 04:20      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.234 ± 0.460 (0.840)</b> C:NA T:95%	pCi/L	12/16/16 19:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.402 ± 0.329 (0.651)</b> C:76% T:86%	pCi/L	12/19/16 16:08	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.418 ± 0.434 (0.646)</b> C:NA T:95%	pCi/L	12/19/16 12:50	13982-63-3	
Radium-228	EPA 904.0	<b>1.14 ± 0.495 (0.813)</b> C:70% T:86%	pCi/L	12/20/16 15:33	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 242588

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples:

METHOD BLANK: 1192367

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0808 ± 0.369 (0.750) C:NA T:86%	pCi/L	12/16/16 20:28	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 242267 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

METHOD BLANK: 1191004 Matrix: Water

Associated Lab Samples: 60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.126 ± 0.289 (0.680) C:NA T:89%	pCi/L	12/12/16 10:08	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 242561

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60232580001

METHOD BLANK: 1192292

Matrix: Water

Associated Lab Samples: 60232580001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.133 ± 0.319 (0.615) C:NA T:96%	pCi/L	12/19/16 12:05	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 242484

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60231804008

METHOD BLANK: 1191925

Matrix: Water

Associated Lab Samples: 60231804008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.304 ± 0.349 (0.206) C:NA T:94%	pCi/L	12/16/16 12:07	

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

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QC Batch: 242592	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228

Associated Lab Samples:

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METHOD BLANK: 1192383 Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.120 ± 0.432 (0.961) C:67% T:74%	pCi/L	12/19/16 16:03	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

QC Batch: 242485

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60231804008

METHOD BLANK: 1191926

Matrix: Water

Associated Lab Samples: 60231804008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.460 ± 0.408 (0.816) C:74% T:63%	pCi/L	12/19/16 16:09	

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

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QC Batch:	242562	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60232580001		

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METHOD BLANK: 1192293 Matrix: Water

Associated Lab Samples: 60232580001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.531 ± 0.446 (0.896) C:61% T:87%	pCi/L	12/20/16 11:48	

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

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QC Batch:	242269	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012		

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METHOD BLANK:	1191007	Matrix:	Water
Associated Lab Samples:	60232056001, 60232056002, 60232056003, 60232056006, 60232056011, 60232056012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.774 ± 0.452 (0.808) C:65% T:73%	pCi/L	12/12/16 11:43	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

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

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

R1 RPD value was outside control limits.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231804008	S-BMW-1S	EPA 200.7	454175	EPA 200.7	454324
60232056001	S-TMW-1	EPA 200.7	454620	EPA 200.7	454778
60232056002	S-TMW-2	EPA 200.7	454620	EPA 200.7	454778
60232056003	S-TMW-3	EPA 200.7	454620	EPA 200.7	454778
60232056006	S-UG-3	EPA 200.7	454620	EPA 200.7	454778
60232056011	S-UWL-DUP-1	EPA 200.7	454620	EPA 200.7	454778
60232056012	S-UWL-FB-1	EPA 200.7	454620	EPA 200.7	454778
60232580001	S-BMW-3S	EPA 200.7	455694	EPA 200.7	455911
60231804008	S-BMW-1S	EPA 200.8	454179	EPA 200.8	454325
60232056001	S-TMW-1	EPA 200.8	454621	EPA 200.8	454777
60232056002	S-TMW-2	EPA 200.8	454621	EPA 200.8	454777
60232056003	S-TMW-3	EPA 200.8	454621	EPA 200.8	454777
60232056006	S-UG-3	EPA 200.8	454621	EPA 200.8	454777
60232056011	S-UWL-DUP-1	EPA 200.8	454621	EPA 200.8	454777
60232056012	S-UWL-FB-1	EPA 200.8	454621	EPA 200.8	454777
60232580001	S-BMW-3S	EPA 200.8	455691	EPA 200.8	455912
60231804008	S-BMW-1S	EPA 7470	455411	EPA 7470	455515
60232056001	S-TMW-1	EPA 7470	456114	EPA 7470	456252
60232056002	S-TMW-2	EPA 7470	456114	EPA 7470	456252
60232056003	S-TMW-3	EPA 7470	456114	EPA 7470	456252
60232056006	S-UG-3	EPA 7470	456114	EPA 7470	456252
60232056011	S-UWL-DUP-1	EPA 7470	456114	EPA 7470	456252
60232056012	S-UWL-FB-1	EPA 7470	456114	EPA 7470	456252
60232580001	S-BMW-3S	EPA 7470	456625	EPA 7470	456654
60231804008	S-BMW-1S	EPA 903.1	242484		
60232056001	S-TMW-1	EPA 903.1	242267		
60232056002	S-TMW-2	EPA 903.1	242267		
60232056003	S-TMW-3	EPA 903.1	242267		
60232056006	S-UG-3	EPA 903.1	242267		
60232056011	S-UWL-DUP-1	EPA 903.1	242267		
60232056012	S-UWL-FB-1	EPA 903.1	242267		
60232580001	S-BMW-3S	EPA 903.1	242561		
60231804008	S-BMW-1S	EPA 904.0	242485		
60232056001	S-TMW-1	EPA 904.0	242269		
60232056002	S-TMW-2	EPA 904.0	242269		
60232056003	S-TMW-3	EPA 904.0	242269		
60232056006	S-UG-3	EPA 904.0	242269		
60232056011	S-UWL-DUP-1	EPA 904.0	242269		
60232056012	S-UWL-FB-1	EPA 904.0	242269		
60232580001	S-BMW-3S	EPA 904.0	242562		
60231804008	S-BMW-1S	SM 2540C	454266		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261461

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60232056001	S-TMW-1	SM 2540C	455196		
60232056002	S-TMW-2	SM 2540C	455196		
60232056003	S-TMW-3	SM 2540C	455196		
60232056006	S-UG-3	SM 2540C	455196		
60232056011	S-UWL-DUP-1	SM 2540C	455196		
60232056012	S-UWL-FB-1	SM 2540C	455196		
60232580001	S-BMW-3S	SM 2540C	456308		
60231804008	S-BMW-1S	SM 4500-H+B	454662		
60232056001	S-TMW-1	SM 4500-H+B	454700		
60232056002	S-TMW-2	SM 4500-H+B	454700		
60232056003	S-TMW-3	SM 4500-H+B	454700		
60232056006	S-UG-3	SM 4500-H+B	454701		
60232056011	S-UWL-DUP-1	SM 4500-H+B	454700		
60232056012	S-UWL-FB-1	SM 4500-H+B	454701		
60232580001	S-BMW-3S	SM 4500-H+B	457036		
60231804008	S-BMW-1S	EPA 300.0	455675		
60231804008	S-BMW-1S	EPA 300.0	455761		
60232056001	S-TMW-1	EPA 300.0	457499		
60232056001	S-TMW-1	EPA 300.0	457514		
60232056002	S-TMW-2	EPA 300.0	457499		
60232056002	S-TMW-2	EPA 300.0	457514		
60232056003	S-TMW-3	EPA 300.0	457499		
60232056003	S-TMW-3	EPA 300.0	457514		
60232056006	S-UG-3	EPA 300.0	457499		
60232056006	S-UG-3	EPA 300.0	457514		
60232056011	S-UWL-DUP-1	EPA 300.0	457499		
60232056011	S-UWL-DUP-1	EPA 300.0	457514		
60232056012	S-UWL-FB-1	EPA 300.0	457499		
60232580001	S-BMW-3S	EPA 300.0	458214		
60232580001	S-BMW-3S	EPA 300.0	458452		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60232056



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-268 / T-239 Type of Ice: Wet Blue  None

Cooler Temperature (°C): As-read 0.7/14.8 Corr. Factor CF +0.7 CF -0.5 Corrected 1.4/15.5/15.3 Date and initials of person examining contents: [Signature]

Temperature should be above freezing to 6°C 14.6

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>pH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>wt</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jami Check Date: 11/11/16

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_



## CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A**  
 Required Client Information:  
 Company: **Golder Associates**  
 Address: **820 South Main Street, Suite 100**  
**St Charles, MO 63301**  
 Email To: **mhaddock@golder.com**  
 Phone: **636-724-9191** Fax: **636-724-9323**  
 Requested Due Date/TAT: **Standard**

**Section B**  
 Required Project Information:  
 Report To: **Mark Haddock (mhaddock@golder.com)**  
 Copy To: **Jeffrey Ingram**  
 Purchase Order No.:  
 Project Name: **Ameren Sioux Energy Center - UWL**  
 Project Number: **153-1406.0003B**

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: **Jamie Church**  
 Pace Profile #: **9285**

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER \_\_\_\_\_  
 Site Location \_\_\_\_\_  
 STATE: **MO**

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS Unpreserved	Preservatives HCl HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Requested Analysis Filtered (Y/N)									Pace Project No./ Lab I.D.
		DATE	TIME					DATE	TIME	Metals*	Chloride/Fluoride/Sulfate	TDS	pH	Radium 226 & 228	Residual Chlorine (Y/N)		
1	S-TMW-1	11/9/14	0832	G	WT	4											60292056
2	S-TMW-2	0701		G	WT	1											115250 182524 24012N 41
3	S-TMW-3	1037		G	WT	1											02
4	S-UG-1A	1537		G	WT	1											03
5	S-UG-2	1724		G	WT	1											04
6	S-UG-3	1315		G	WT	1											05
7	S-DG-1	1415		G	WT	1											06
8	S-DG-2	1235		G	WT	1											07
9	S-DG-3	1145		G	WT	1											08
10	S-DG-4	1200		G	WT	12	3	3	3	3	3	3	3	3	3	3	09
11	S-UWL-DUP-1			G	WT	4	1	1	1	1	1	1	1	1	1	1	010
12	S-UWL-FB-1	1715		G	WT	4	1	1	1	1	1	1	1	1	1	1	011

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
<i>J. St. Ignace</i>	11/10/14	1200	<i>P. Haddock</i>	11/11/14	0400	X Y
<i>J. St. Ignace</i>			<i>P. Haddock</i>	11/11/14		N Y
						N Y

Temp in °C		Received on		Custody Sealed		Samples In tact
	15-3		11/10/14			
SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <i>Jeff Ingram</i> SIGNATURE of SAMPLER: <i>Jeff Ingram</i> DATE Signed (MM/DD/YY): <i>11/10/14</i>						

\*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.



Sample Condition Upon Receipt

WO#: 60231804
Barcode
60231804

Client Name: Golder

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

Tracking #: Pace Shipping Label Used? Yes [ ] No [ ]

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

Packing Material: Bubble Wrap [ ] Bubble Bags [ ] Foam [ ] None [ ] Other [ ]

Thermometer Used: T-266 T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.4/14.2 Corr. Factor CF +0.7 CF -0.5 Corrected 2.1/14.9/15.3

Date and initials of person examining contents: PHT PV 11/9/16

Table with 2 columns: Question and Yes/No/N/A checkboxes. Rows include Chain of Custody present, Samples arrived within holding time, Short Hold Time analyses, Containers intact, etc.

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Jami Chet 11/9/16

Date:





# CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A**  
 Required Client Information:  
 Company: **Golder Associates**  
 Address: **820 South Main Street, Suite 100**  
 St Charles, MO 63301  
 Email To: **maddock@golder.com**  
 Phone: **636-724-9191** Fax: **636-724-9323**  
 Requested Due Date/TAT: **Standard**

**Section B**  
 Required Project Information:  
 Report To: **Mark Haddock (mhaddock@golder.com)**  
 Copy To: **Jeffrey Ingram**  
 Purchase Order No.:  
 Project Name: **Ameren Sioux Energy Center - Fly Ash**  
 Project Number: **153-1406.0003B**

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: **Jamie Church**  
 Pace Profile #: **9285**

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER  
 Site Location: \_\_\_\_\_ MO  
 STATE: \_\_\_\_\_

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DWI WT WW P SL OL WP AR OT IS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives HCl HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> Unpreserved	Analysis Test ↑	Metals * N N N N N N N N N N N	Chloride/Fluoride/Sulfate N N N N N N N N N N N	TDS N N N N N N N N N N N	pH N N N N N N N N N N N	Radium 226 & 228 N N N N N N N N N N N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB												
			DATE	TIME												
1	S-LMW-1S	WT	11/16/16	1025	G	WT	123	9	1	3	5	5	3	3	3	60231406
2	S-LMW-2S	WT	11/16/16	1536	G	WT	41	3	1	1	1	1	1	1	1	18330182M 28AN 002
3	S-LMW-3S	WT	11/16/16	1520	G	WT	52	2	1	1	1	1	1	1	1	18330182M 28AN 002
4	S-LMW-4S	WT	11/16/16	1320	G	WT	41	3	1	1	1	1	1	1	1	18330182M 28AN 002
5	S-LMW-5S	WT	11/16/16	1245	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
6	S-LMW-6S	WT	11/16/16	1353	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
7	S-LMW-7S	WT	11/16/16	1403	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
8	S-LMW-8S	WT	11/16/16	0905	G	WT	41	3	1	1	1	1	1	1	1	18330182M 28AN 002
9	S-LMW-9S	WT	11/16/16	11536	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
10	S-BMW-1S	WT	11/16/16	11536	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
11	S-BMW-2S	WT	11/16/16	11536	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002
12	S-LMW-DUP-1	WT	11/16/16	11536	G	WT	11	1	1	1	1	1	1	1	1	18330182M 28AN 002

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
Jamie Church / Pace	11/16/16	1700	Jamie Church / Pace	11/16/16	1700
Jamie Church / Pace	11/16/16	1700	Jamie Church / Pace	11/16/16	0420

**ADDITIONAL COMMENTS**  
 \*EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg  
 EPA 200.8: Sb, As, Cd, Cr, Se, Tl

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: **Jeff Ingram**  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YYYY): **11/8/16**

Temp in °C: **15.3**  
 Received on Ice (Y/N): **X**  
 Custody Sealed (Y/N): **X**  
 Samples Intact (Y/N): **X**





Sample Condition Upon Receipt

WO#: 60232580
Barcode
60232580

Client Name: Golder

JL

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

Tracking #: Pace Shipping Label Used? Yes [ ] No [ ]

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

Packing Material: Bubble Wrap [ ] Bubble Bags [ ] Foam [ ] None [ ] Other [ ]

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.5/15.6 Corr. Factor CF +0.7 CF -0.5 Corrected 2-2/16.3

Date and initials of person examining contents:

PVH/18/16

Temperature should be above freezing to 6°C

Table with 2 columns: Question/Condition and Yes/No/N/A checkboxes. Rows include Chain of Custody present, Samples arrived within holding time, Short Hold Time analyses (<72hr), 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?, Sample labels match COC: Date / time / ID / analyses, Samples contain multiple phases? Matrix: WT, Containers requiring pH preservation in compliance?, Cyanide water sample checks: N/A, Lead acetate strip turns dark? (Record only), Potassium iodide test strip turns blue/purple? (Preserve), Trip Blank present, Headspace in VOA vials (>6mm), Samples from USDA Regulated Area: State, 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/Time:

Comments/ Resolution:

Project Manager Review: Jami Chok Date: 11/11/16



January 12, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60233959

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on December 09, 2016. 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,



Jamie Church  
jamie.church@pacelabs.com  
Project Manager

Enclosures

cc: Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

---

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

---

### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60233959001	S-BMW-3S	Water	12/08/16 10:30	12/09/16 04:40

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60233959001	S-BMW-3S	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	JLW	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

**Sample: S-BMW-3S**      **Lab ID: 60233959001**      Collected: 12/08/16 10:30      Received: 12/09/16 04:40      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>198</b>	ug/L	5.0	0.58	1	12/13/16 15:05	12/15/16 14:58	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	12/13/16 15:05	12/15/16 14:58	7440-41-7	
Boron	<b>70.6J</b>	ug/L	100	50.0	1	12/13/16 15:05	12/15/16 14:58	7440-42-8	
Calcium	<b>128000</b>	ug/L	100	8.1	1	12/13/16 15:05	12/15/16 14:58	7440-70-2	
Cobalt	<b>1.8J</b>	ug/L	5.0	0.72	1	12/13/16 15:05	12/15/16 14:58	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	12/13/16 15:05	12/15/16 14:58	7439-92-1	
Lithium	<b>7.3J</b>	ug/L	10.0	4.9	1	12/13/16 15:05	12/15/16 14:58	7439-93-2	
Molybdenum	<b>9.3J</b>	ug/L	20.0	0.52	1	12/13/16 15:05	12/15/16 14:58	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.10J</b>	ug/L	1.0	0.058	1	12/13/16 10:50	12/14/16 12:33	7440-36-0	
Arsenic	<b>1.4</b>	ug/L	1.0	0.10	1	12/13/16 10:50	12/14/16 12:33	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	12/13/16 10:50	12/14/16 12:33	7440-43-9	
Chromium	<b>0.57J</b>	ug/L	1.0	0.34	1	12/13/16 10:50	12/14/16 12:33	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	12/13/16 10:50	12/14/16 12:33	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	12/13/16 10:50	12/14/16 12:33	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.039</b>	ug/L	0.20	0.039	1	12/13/16 14:15	12/14/16 10:27	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>447</b>	mg/L	5.0	5.0	1		12/13/16 16:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		12/19/16 08:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>12.0</b>	mg/L	1.0	0.50	1		12/22/16 01:05	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.027	1		12/22/16 01:05	16984-48-8	
Sulfate	<b>32.2</b>	mg/L	2.0	0.31	2		12/22/16 11:33	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch:	458785	Analysis Method:	EPA 7470
QC Batch Method:	EPA 7470	Analysis Description:	7470 Mercury
Associated Lab Samples:	60233959001		

METHOD BLANK: 1878151 Matrix: Water  
Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	12/14/16 09:58	

LABORATORY CONTROL SAMPLE: 1878152

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1878153 1878154

Parameter	Units	60233685001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	5	5	4.6	4.9	92	98	75-125	6	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60233959

QC Batch: 458773 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60233959001

METHOD BLANK: 1878108 Matrix: Water  
Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	1.8J	5.0	0.58	12/15/16 14:00	
Beryllium	ug/L	<0.26	1.0	0.26	12/15/16 14:00	
Boron	ug/L	<50.0	100	50.0	12/15/16 14:00	
Calcium	ug/L	<8.1	100	8.1	12/15/16 14:00	
Cobalt	ug/L	<0.72	5.0	0.72	12/15/16 14:00	
Lead	ug/L	<2.5	5.0	2.5	12/15/16 14:00	
Lithium	ug/L	<4.9	10.0	4.9	12/15/16 14:00	
Molybdenum	ug/L	<0.52	20.0	0.52	12/15/16 14:00	

LABORATORY CONTROL SAMPLE: 1878109

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1070	107	85-115	
Beryllium	ug/L	1000	1020	102	85-115	
Boron	ug/L	1000	1000	100	85-115	
Calcium	ug/L	10000	9910	99	85-115	
Cobalt	ug/L	1000	1070	107	85-115	
Lead	ug/L	1000	1060	106	85-115	
Lithium	ug/L	1000	1080	108	85-115	
Molybdenum	ug/L	1000	1090	109	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1878110 1878111

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60234024001 Result	Spike Conc.	Spike Conc.	MS Result						
Barium	ug/L	19.7	1000	1000	1080	1080	107	106	70-130	0	20
Beryllium	ug/L	ND	1000	1000	1000	999	100	100	70-130	0	20
Boron	ug/L	ND	1000	1000	1030	1020	102	102	70-130	0	20
Calcium	ug/L	223000	10000	10000	230000	232000	65	83	70-130	1	20 M1
Cobalt	ug/L	ND	1000	1000	1030	1030	103	103	70-130	0	20
Lead	ug/L	ND	1000	1000	1010	1010	101	101	70-130	0	20
Lithium	ug/L	25.7	1000	1000	1120	1110	110	109	70-130	1	20
Molybdenum	ug/L	ND	1000	1000	1100	1100	108	108	70-130	0	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

MATRIX SPIKE SAMPLE:		1878112					
Parameter	Units	60233958001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	667	1000	1710	105	70-130	
Beryllium	ug/L	<0.26	1000	997	100	70-130	
Boron	ug/L	53.1J	1000	1050	100	70-130	
Calcium	ug/L	103000	10000	112000	85	70-130	
Cobalt	ug/L	<0.72	1000	1010	101	70-130	
Lead	ug/L	<2.5	1000	991	99	70-130	
Lithium	ug/L	20.6	1000	1080	106	70-130	
Molybdenum	ug/L	1.8J	1000	1050	105	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 458723 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60233959001

METHOD BLANK: 1877907 Matrix: Water

Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	12/14/16 11:37	
Arsenic	ug/L	<0.10	1.0	0.10	12/14/16 11:37	
Cadmium	ug/L	<0.029	0.50	0.029	12/14/16 11:37	
Chromium	ug/L	<0.34	1.0	0.34	12/14/16 11:37	
Selenium	ug/L	<0.18	1.0	0.18	12/14/16 11:37	
Thallium	ug/L	<0.50	1.0	0.50	12/14/16 11:37	

LABORATORY CONTROL SAMPLE: 1877908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	98	85-115	
Arsenic	ug/L	40	39.5	99	85-115	
Cadmium	ug/L	40	40.0	100	85-115	
Chromium	ug/L	40	41.0	103	85-115	
Selenium	ug/L	40	38.8	97	85-115	
Thallium	ug/L	40	40.5	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1877909 1877910

Parameter	Units	7555053001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MS Result	MSD Result						
Antimony	ug/L	1.0	40	40	40.1	41.1	98	100	70-130	2	20	
Arsenic	ug/L	0.0039	40	40	45.0	46.2	103	106	70-130	3	20	
Cadmium	ug/L	ND	40	40	37.2	38.0	93	95	70-130	2	20	
Chromium	ug/L	0.0026	40	40	41.0	41.7	96	98	70-130	2	20	
Selenium	ug/L	ND	40	40	39.0	39.6	96	98	70-130	2	20	
Thallium	ug/L	ND	40	40	40.1	41.0	100	102	70-130	2	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 458809

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60233959001

METHOD BLANK: 1878246

Matrix: Water

Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	12/13/16 16:40	

LABORATORY CONTROL SAMPLE: 1878247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	921	92	80-120	

SAMPLE DUPLICATE: 1878248

Parameter	Units	60233763001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	411	424	3	10	

SAMPLE DUPLICATE: 1878249

Parameter	Units	60233959001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	447	448	0	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 459374 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60233959001

SAMPLE DUPLICATE: 1880971

Parameter	Units	60233789001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.9	7.9	1	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60233959

QC Batch: 459810 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60233959001

METHOD BLANK: 1882488 Matrix: Water  
Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/21/16 22:31	
Fluoride	mg/L	<0.027	0.20	0.027	12/21/16 22:31	

LABORATORY CONTROL SAMPLE: 1882489

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1882490 1882491

Parameter	Units	60233958001		1882491		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	10.8	5	5	16.4	16.5	111	114	80-120	1	15
Fluoride	mg/L	0.34	2.5	2.5	2.7	2.8	96	97	80-120	1	15

MATRIX SPIKE SAMPLE: 1882492

Parameter	Units	60233959001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	12.0	5	17.7	113	80-120	
Fluoride	mg/L	0.33	2.5	2.7	95	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 459964

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60233959001

METHOD BLANK: 1883030

Matrix: Water

Associated Lab Samples: 60233959001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	12/22/16 10:24	

LABORATORY CONTROL SAMPLE: 1883031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1883032 1883033

Parameter	Units	60233958001		1883032		1883033		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Sulfate	mg/L	36.8	10	10	10	47.3	47.3	105	105	80-120	0	15

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0623 ± 0.285 (0.579)</b> C:NA T:92%	pCi/L	01/11/17 11:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.680 ± 0.544 (1.08)</b> C:72% T:87%	pCi/L	01/11/17 15:06	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 245313

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60233959001

METHOD BLANK: 1207357

Matrix: Water

Associated Lab Samples: 60233959001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.119 ± 0.379 (0.855) C:66% T:74%	pCi/L	01/10/17 12:05	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

QC Batch: 245312

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60233959001

METHOD BLANK: 1207356

Matrix: Water

Associated Lab Samples: 60233959001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.167 ± 0.462 (0.783) C:NA T:91%	pCi/L	01/09/17 15:07	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

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### 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.

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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60233959

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60233959001	S-BMW-3S	EPA 200.7	458773	EPA 200.7	458836
60233959001	S-BMW-3S	EPA 200.8	458723	EPA 200.8	458750
60233959001	S-BMW-3S	EPA 7470	458785	EPA 7470	458813
60233959001	S-BMW-3S	EPA 903.1	245312		
60233959001	S-BMW-3S	EPA 904.0	245313		
60233959001	S-BMW-3S	SM 2540C	458809		
60233959001	S-BMW-3S	SM 4500-H+B	459374		
60233959001	S-BMW-3S	EPA 300.0	459810		
60233959001	S-BMW-3S	EPA 300.0	459964		

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Sample Condition Upon Receipt

WO#: 60233959



60233959

Stc

Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  Nons  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue  None

Cooler Temperature (°C): As-read 0.6/11.8 Corr. Factor CF +0.7 CF -0.5 Corrected 1.3/12.5

Date and initials of person examining contents:

p 12/9/16

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Chueh \_\_\_\_\_ 129/16 \_\_\_\_\_ Date: \_\_\_\_\_





January 29, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261462

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on January 05, 2017. 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.

REV-1, 1/29/18: Radium pulled in for S-UWL-DUP-1, S-UWL-FB-1, S-BMW-1S and S-BMW-3S

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60235457001	S-TMW-1	Water	01/04/17 11:40	01/05/17 05:45
60235457002	S-TMW-2	Water	01/04/17 10:35	01/05/17 05:45
60235457003	S-TMW-3	Water	01/04/17 12:45	01/05/17 05:45
60235457006	S-UG-3	Water	01/04/17 15:10	01/05/17 05:45
60235457009	S-TMW-3 MS	Water	01/04/17 12:45	01/05/17 05:45
60235457010	S-TMW-3 MSD	Water	01/04/17 12:45	01/05/17 05:45
60235457007	S-UWL-DUP-1	Water	01/04/17 08:00	01/05/17 05:45
60235457008	S-UWL-FB-1	Water	01/03/17 16:10	01/05/17 05:45
60235474007	S-BMW-1S	Water	01/04/17 12:35	01/05/17 05:45
60235474008	S-BMW-3S	Water	01/04/17 15:20	01/05/17 05:45

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60235457001	S-TMW-1	EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60235457002	S-TMW-2	EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
60235457003	S-TMW-3	SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235457006	S-UG-3	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60235457009	S-TMW-3 MS	EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235457010	S-TMW-3 MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235457007	S-UWL-DUP-1	EPA 200.7	ZBM	8	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60235457008	S-UWL-FB-1	EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		60235474007	S-BMW-1S	EPA 300.0	OL
EPA 200.7	ZBM			8	PASI-K
EPA 200.8	JGP			6	PASI-K
EPA 7470	TDS			1	PASI-K
EPA 903.1	WRR			1	PASI-PA
EPA 904.0	JLW			1	PASI-PA
SM 2540C	JSS			1	PASI-K
SM 4500-H+B	AGO			1	PASI-K
EPA 300.0	OL			3	PASI-K
EPA 200.7	ZBM			8	PASI-K
60235474008	S-BMW-3S	EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-1**      **Lab ID: 60235457001**      Collected: 01/04/17 11:40      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>192</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/09/17 11:48	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/09/17 11:48	7440-41-7	
Boron	<b>66.1J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/09/17 11:48	7440-42-8	
Calcium	<b>101000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/09/17 11:48	7440-70-2	
Cobalt	<b>1.6J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/09/17 11:48	7440-48-4	
Lead	<b>2.7J</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/09/17 11:48	7439-92-1	B
Lithium	<b>26.7</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/09/17 11:48	7439-93-2	
Molybdenum	<b>1.7J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/09/17 11:48	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.19J</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 13:31	7440-36-0	
Arsenic	<b>0.19J</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 13:31	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 13:31	7440-43-9	
Chromium	<b>0.42J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 13:31	7440-47-3	
Selenium	<b>0.37J</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 13:31	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 13:31	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:14	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>339</b>	mg/L	5.0	5.0	1		01/06/17 10:30		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		01/11/17 11:32		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.9</b>	mg/L	1.0	0.50	1		01/21/17 11:40	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.027	1		01/21/17 11:40	16984-48-8	
Sulfate	<b>37.7</b>	mg/L	5.0	0.77	5		01/22/17 11:54	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-2**      **Lab ID: 60235457002**      Collected: 01/04/17 10:35      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>225</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/09/17 11:50	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/09/17 11:50	7440-41-7	
Boron	<b>75.8J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/09/17 11:50	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/09/17 11:50	7440-70-2	
Cobalt	<b>1.6J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/09/17 11:50	7440-48-4	
Lead	<b>3.8J</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/09/17 11:50	7439-92-1	B
Lithium	<b>32.0</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/09/17 11:50	7439-93-2	
Molybdenum	<b>0.68J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/09/17 11:50	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 13:36	7440-36-0	
Arsenic	<b>5.3</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 13:36	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 13:36	7440-43-9	
Chromium	<b>0.43J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 13:36	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 13:36	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 13:36	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:15	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>403</b>	mg/L	5.0	5.0	1		01/06/17 10:30		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		01/11/17 11:34		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.6</b>	mg/L	1.0	0.50	1		01/21/17 12:22	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.027	1		01/21/17 12:22	16984-48-8	
Sulfate	<b>32.5</b>	mg/L	2.0	0.31	2		01/22/17 12:08	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-3**      **Lab ID: 60235457003**      Collected: 01/04/17 12:45      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b> Analytical Method: EPA 200.7      Preparation Method: EPA 200.7									
Barium	<b>258</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/09/17 11:57	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/09/17 11:57	7440-41-7	
Boron	<b>76.1J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/09/17 11:57	7440-42-8	
Calcium	<b>124000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/09/17 11:57	7440-70-2	M1
Cobalt	<b>2.2J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/09/17 11:57	7440-48-4	
Lead	<b>4.2J</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/09/17 11:57	7439-92-1	B
Lithium	<b>32.1</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/09/17 11:57	7439-93-2	
Molybdenum	<b>1.1J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/09/17 11:57	7439-98-7	
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8									
Antimony	<b>0.10J</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 13:40	7440-36-0	
Arsenic	<b>1.6</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 13:40	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 13:40	7440-43-9	
Chromium	<b>0.55J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 13:40	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 13:40	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 13:40	7440-28-0	
<b>7470 Mercury</b> Analytical Method: EPA 7470      Preparation Method: EPA 7470									
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:17	7439-97-6	
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>454</b>	mg/L	5.0	5.0	1		01/06/17 10:33		
<b>4500H+ pH, Electrometric</b> Analytical Method: SM 4500-H+B									
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		01/11/17 11:35		H6
<b>300.0 IC Anions 28 Days</b> Analytical Method: EPA 300.0									
Chloride	<b>1.6</b>	mg/L	1.0	0.50	1		01/21/17 12:36	16887-00-6	
Fluoride	<b>0.27</b>	mg/L	0.20	0.027	1		01/21/17 12:36	16984-48-8	
Sulfate	<b>55.7</b>	mg/L	5.0	0.77	5		01/22/17 12:22	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-UG-3**      **Lab ID: 60235457006**      Collected: 01/04/17 15:10      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>221</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:28	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:28	7440-41-7	
Boron	<b>218</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:28	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:28	7440-70-2	
Cobalt	<b>3.8J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:28	7440-48-4	
Lead	<b>2.8J</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:28	7439-92-1	B
Lithium	<b>29.8</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:28	7439-93-2	
Molybdenum	<b>3.4J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:28	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.20J</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 14:14	7440-36-0	
Arsenic	<b>0.13J</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 14:14	7440-38-2	
Cadmium	<b>0.26J</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 14:14	7440-43-9	B
Chromium	<b>0.47J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 14:14	7440-47-3	
Selenium	<b>2.7</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 14:14	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 14:14	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:24	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>451</b>	mg/L	5.0	5.0	1		01/06/17 10:36		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		01/11/17 11:43		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>34.2</b>	mg/L	2.0	1.0	2		01/22/17 14:27	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.027	1		01/21/17 13:31	16984-48-8	
Sulfate	<b>62.7</b>	mg/L	5.0	0.77	5		01/22/17 14:41	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-UWL-DUP-1**      **Lab ID: 60235457007**      Collected: 01/04/17 08:00      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>215</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:31	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:31	7440-41-7	
Boron	<b>177</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:31	7440-42-8	
Calcium	<b>117000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:31	7440-70-2	
Cobalt	<b>4.6J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:31	7440-48-4	
Lead	<b>2.5J</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:31	7439-92-1	B
Lithium	<b>27.1</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:31	7439-93-2	
Molybdenum	<b>3.3J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:31	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.20J</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 14:19	7440-36-0	
Arsenic	<b>0.30J</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 14:19	7440-38-2	
Cadmium	<b>0.25J</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 14:19	7440-43-9	B
Chromium	<b>0.47J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 14:19	7440-47-3	
Selenium	<b>2.5</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 14:19	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 14:19	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:25	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>464</b>	mg/L	5.0	5.0	1		01/06/17 10:37		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		01/11/17 11:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>35.2</b>	mg/L	2.0	1.0	2		01/22/17 14:55	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		01/21/17 13:45	16984-48-8	
Sulfate	<b>63.6</b>	mg/L	5.0	0.77	5		01/22/17 15:09	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-UWL-FB-1**      **Lab ID: 60235457008**      Collected: 01/03/17 16:10      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<0.58	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:33	7440-39-3	
Beryllium	0.26J	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:33	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:33	7440-42-8	
Calcium	26.6J	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:33	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:33	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:33	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:33	7439-93-2	
Molybdenum	<0.52	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:33	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<0.058	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 14:23	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 14:23	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 14:23	7440-43-9	
Chromium	0.36J	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 14:23	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 14:23	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 14:23	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<0.055	ug/L	0.20	0.055	1	01/16/17 09:00	01/16/17 13:29	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		01/09/17 16:00		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.8	Std. Units	0.10	0.10	1		01/11/17 11:47		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		01/21/17 14:27	16887-00-6	
Fluoride	<0.027	mg/L	0.20	0.027	1		01/21/17 14:27	16984-48-8	
Sulfate	<0.15	mg/L	1.0	0.15	1		01/21/17 14:27	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-BMW-1S**      **Lab ID: 60235474007**      Collected: 01/04/17 12:35      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>152</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:58	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:58	7440-41-7	
Boron	<b>82.2J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:58	7440-42-8	
Calcium	<b>158000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:58	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:58	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:58	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:58	7439-93-2	
Molybdenum	<b>2.2J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:58	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.084J</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 15:10	7440-36-0	
Arsenic	<b>0.71J</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 15:10	7440-38-2	
Cadmium	<b>0.099J</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 15:10	7440-43-9	B
Chromium	<b>0.57J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 15:10	7440-47-3	
Selenium	<b>0.30J</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 15:10	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 15:10	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/12/17 09:55	01/12/17 14:08	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>533</b>	mg/L	5.0	5.0	1		01/06/17 10:54		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		01/11/17 12:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>7.6</b>	mg/L	1.0	0.50	1		01/15/17 19:29	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.027	1		01/15/17 19:29	16984-48-8	
Sulfate	<b>26.5</b>	mg/L	2.0	0.31	2		01/17/17 19:52	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-BMW-3S**      **Lab ID: 60235474008**      Collected: 01/04/17 15:20      Received: 01/05/17 05:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>675</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 16:00	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 16:00	7440-41-7	
Boron	<b>62.3J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 16:00	7440-42-8	
Calcium	<b>110000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 16:00	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 16:00	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 16:00	7439-92-1	
Lithium	<b>23.8</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 16:00	7439-93-2	
Molybdenum	<b>&lt;0.52</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 16:00	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	01/06/17 10:00	01/11/17 15:14	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 15:14	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 15:14	7440-43-9	
Chromium	<b>0.51J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 15:14	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 15:14	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 15:14	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.055</b>	ug/L	0.20	0.055	1	01/12/17 09:55	01/12/17 14:10	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>419</b>	mg/L	5.0	5.0	1		01/06/17 10:55		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.4</b>	Std. Units	0.10	0.10	1		01/11/17 12:02		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.7</b>	mg/L	1.0	0.50	1		01/15/17 20:25	16887-00-6	
Fluoride	<b>0.25</b>	mg/L	0.20	0.027	1		01/15/17 20:25	16984-48-8	
Sulfate	<b>24.7</b>	mg/L	2.0	0.31	2		01/17/17 20:06	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461806 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1890258 Matrix: Water  
 Associated Lab Samples: 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.055	0.20	0.055	01/12/17 13:27	

LABORATORY CONTROL SAMPLE: 1890259

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1890260 1890261

Parameter	Units	60235627003		1890261		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Mercury	ug/L	<0.055	5	5	5.5	5.4	110	108	75-125	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.

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 462059

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

METHOD BLANK: 1891887

Matrix: Water

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.055	0.20	0.055	01/16/17 12:40	

LABORATORY CONTROL SAMPLE: 1891888

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.4	108	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1891889 1891890

Parameter	Units	60235457003		1891889		1891890		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.					
Mercury	ug/L	<0.055	5	5	5	5.6	5.6	112	111	75-125	0	20

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261462

QC Batch: 461335 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235474007, 60235474008

METHOD BLANK: 1888310 Matrix: Water  
Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	01/09/17 11:37	
Beryllium	ug/L	<0.26	1.0	0.26	01/09/17 11:37	
Boron	ug/L	<50.0	100	50.0	01/09/17 11:37	
Calcium	ug/L	24.6J	100	8.1	01/09/17 11:37	
Cobalt	ug/L	<0.72	5.0	0.72	01/09/17 11:37	
Lead	ug/L	2.9J	5.0	2.5	01/09/17 11:37	
Lithium	ug/L	<4.9	10.0	4.9	01/09/17 11:37	
Molybdenum	ug/L	<0.52	20.0	0.52	01/09/17 11:37	

LABORATORY CONTROL SAMPLE: 1888311

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	998	100	85-115	
Beryllium	ug/L	1000	1000	100	85-115	
Boron	ug/L	1000	930	93	85-115	
Calcium	ug/L	10000	9940	99	85-115	
Cobalt	ug/L	1000	1010	101	85-115	
Lead	ug/L	1000	997	100	85-115	
Lithium	ug/L	1000	1030	103	85-115	
Molybdenum	ug/L	1000	1030	103	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888312 1888313

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60235457003 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Barium	ug/L	258	1000	1000	1260	1270	101	101	70-130	0	20	
Beryllium	ug/L	<0.26	1000	1000	997	992	100	99	70-130	1	20	
Boron	ug/L	76.1J	1000	1000	1030	1010	95	94	70-130	1	20	
Calcium	ug/L	124000	10000	10000	138000	139000	142	147	70-130	0	20	M1
Cobalt	ug/L	2.2J	1000	1000	979	971	98	97	70-130	1	20	
Lead	ug/L	4.2J	1000	1000	967	960	96	96	70-130	1	20	
Lithium	ug/L	32.1	1000	1000	1080	1090	105	106	70-130	1	20	
Molybdenum	ug/L	1.1J	1000	1000	1030	1020	103	102	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

MATRIX SPIKE SAMPLE:		1888314					
Parameter	Units	60235457004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	241	1000	1220	98	70-130	
Beryllium	ug/L	<0.26	1000	978	98	70-130	
Boron	ug/L	149	1000	1090	94	70-130	
Calcium	ug/L	124000	10000	135000	105	70-130	
Cobalt	ug/L	1.2J	1000	963	96	70-130	
Lead	ug/L	2.9J	1000	951	95	70-130	
Lithium	ug/L	36.9	1000	1060	103	70-130	
Molybdenum	ug/L	<0.52	1000	1010	101	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261462

QC Batch: 461338 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235474007, 60235474008

METHOD BLANK: 1888324 Matrix: Water  
Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	01/11/17 13:23	
Arsenic	ug/L	<0.10	1.0	0.10	01/11/17 13:23	
Cadmium	ug/L	0.033J	0.50	0.029	01/11/17 13:23	
Chromium	ug/L	<0.34	1.0	0.34	01/11/17 13:23	
Selenium	ug/L	<0.18	1.0	0.18	01/11/17 13:23	
Thallium	ug/L	<0.50	1.0	0.50	01/11/17 13:23	

LABORATORY CONTROL SAMPLE: 1888325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.1	100	85-115	
Arsenic	ug/L	40	38.0	95	85-115	
Cadmium	ug/L	40	39.5	99	85-115	
Chromium	ug/L	40	41.1	103	85-115	
Selenium	ug/L	40	36.5	91	85-115	
Thallium	ug/L	40	40.3	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1888326 1888327

Parameter	Units	60235457003 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec	% Rec	RPD				
Antimony	ug/L	0.10J	40	40	40.1	40.4	100	101	70-130	1	20		
Arsenic	ug/L	1.6	40	40	39.6	39.2	95	94	70-130	1	20		
Cadmium	ug/L	<0.029	40	40	38.8	38.6	97	97	70-130	0	20		
Chromium	ug/L	0.55J	40	40	40.0	40.2	99	99	70-130	0	20		
Selenium	ug/L	<0.18	40	40	35.2	35.6	88	89	70-130	1	20		
Thallium	ug/L	<0.50	40	40	41.6	41.5	104	104	70-130	0	20		

MATRIX SPIKE SAMPLE: 1888328

Parameter	Units	60235457005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.31J	40	41.5	103	70-130	
Arsenic	ug/L	0.34J	40	39.6	98	70-130	
Cadmium	ug/L	0.081J	40	39.9	100	70-130	
Chromium	ug/L	0.46J	40	39.4	97	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

MATRIX SPIKE SAMPLE:		1888328					
Parameter	Units	60235457005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	1.5	40	40.4	97	70-130	
Thallium	ug/L	<0.50	40	41.0	102	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461337

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1888320

Matrix: Water

Associated Lab Samples: 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/06/17 10:39	

LABORATORY CONTROL SAMPLE: 1888321

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	100	80-120	

SAMPLE DUPLICATE: 1888322

Parameter	Units	60235335001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6900	6850	1	10	

SAMPLE DUPLICATE: 1888323

Parameter	Units	60235514003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	693	692	0	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461340

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

METHOD BLANK: 1888333

Matrix: Water

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/06/17 10:25	

LABORATORY CONTROL SAMPLE: 1888334

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	962	96	80-120	

SAMPLE DUPLICATE: 1888335

Parameter	Units	60235457003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	454	464	2	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461527

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60235457008

METHOD BLANK: 1889118

Matrix: Water

Associated Lab Samples: 60235457008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/09/17 15:57	

LABORATORY CONTROL SAMPLE: 1889119

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

SAMPLE DUPLICATE: 1889120

Parameter	Units	60235625001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	374	377	1	10	

SAMPLE DUPLICATE: 1889121

Parameter	Units	60235627003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	367	375	2	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461642 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235474007

SAMPLE DUPLICATE: 1889573

Parameter	Units	60235457003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 461643 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60235474008

SAMPLE DUPLICATE: 1889574

Parameter	Units	60235474008 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 462036 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1891820 Matrix: Water

Associated Lab Samples: 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/15/17 16:42	
Fluoride	mg/L	<0.027	0.20	0.027	01/15/17 16:42	

LABORATORY CONTROL SAMPLE: 1891821

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Fluoride	mg/L	2.5	2.6	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1891822 1891823

Parameter	Units	60235474001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Fluoride	mg/L	0.31	2.5	2.5	2.9	3.1	105	111	80-120	5	15	

MATRIX SPIKE SAMPLE: 1891824

Parameter	Units	60235627003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.25	2.5	2.9	108	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 462119

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1892092

Matrix: Water

Associated Lab Samples: 60235474007, 60235474008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	01/17/17 15:56	

LABORATORY CONTROL SAMPLE: 1892093

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.2	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1892094 1892095

Parameter	Units	60235474003		60235474007		60235474008		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Sulfate	mg/L	856	500	500	1470	1440	123	117	80-120	2	15 M1

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 462745 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

METHOD BLANK: 1894695 Matrix: Water  
 Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/21/17 09:20	
Fluoride	mg/L	<0.027	0.20	0.027	01/21/17 09:20	
Sulfate	mg/L	<0.15	1.0	0.15	01/21/17 09:20	

LABORATORY CONTROL SAMPLE: 1894696

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1894697 1894698

Parameter	Units	60235457001		1894698		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	3.9	5	5	9.7	9.3	115	108	80-120	4	15
Fluoride	mg/L	0.32	2.5	2.5	3.3	3.1	117	109	80-120	6	15

MATRIX SPIKE SAMPLE: 1894699

Parameter	Units	60235457003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.6	5	6.9	107	80-120	
Fluoride	mg/L	0.27	2.5	3.0	111	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 462784 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007

METHOD BLANK: 1895026 Matrix: Water  
 Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/22/17 10:23	
Sulfate	mg/L	<0.15	1.0	0.15	01/22/17 10:23	

LABORATORY CONTROL SAMPLE: 1895027

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1895028 1895029

Parameter	Units	60235457003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	55.7	25	25	82.7	84.0	108	113	80-120	2	15	

MATRIX SPIKE SAMPLE: 1895030

Parameter	Units	60235624001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	43.9	25	71.6	111	80-120	
Sulfate	mg/L	104	50	160	111	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-1**      **Lab ID: 60235457001**      Collected: 01/04/17 11:40      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.449 ± 0.466 (0.694)</b> C:NA T:96%	pCi/L	01/28/17 19:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.372 ± 0.358 (0.731)</b> C:64% T:88%	pCi/L	01/30/17 18:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-2**      **Lab ID: 60235457002**      Collected: 01/04/17 10:35      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.479 ± 0.446 (0.588)</b> C:NA T:96%	pCi/L	01/28/17 19:22	13982-63-3	
Radium-228	EPA 904.0	<b>-0.106 ± 0.368 (0.879)</b> C:62% T:88%	pCi/L	01/30/17 18:26	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

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**Sample: S-TMW-3**      **Lab ID: 60235457003**      Collected: 01/04/17 12:45      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.162 ± 0.371 (0.598)</b> C:NA T:89%	pCi/L	01/28/17 19:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.599 ± 0.440 (0.860)</b> C:63% T:86%	pCi/L	01/30/17 18:26	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-UG-3**      **Lab ID: 60235457006**      Collected: 01/04/17 15:10      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.311 ± 0.375 (0.573)</b> <b>C:NA T:89%</b>	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	<b>0.220 ± 0.444 (0.978)</b> <b>C:65% T:82%</b>	pCi/L	01/30/17 18:27	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	79.8 %REC +/- NA (NA) C:NA T:NA	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	96.4 %REC +/- NA (NA) C:NA T:NA	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-TMW-3 MSD**      **Lab ID: 60235457010**      Collected: 01/04/17 12:45      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>98.9 %REC 21.3 RPD +/- NA</b> <b>(NA)</b> <b>C:NA T:NA</b>	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	<b>92.8 %REC 3.75 RPD +/- NA</b> <b>(NA)</b> <b>C:NA T:NA</b>	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.298 ± 0.414 (0.692)</b> C:NA T:92%	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	<b>0.560 ± 0.386 (0.744)</b> C:68% T:93%	pCi/L	01/30/17 18:27	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.154 ± 0.426 (0.826)</b> C:NA T:92%	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	<b>1.09 ± 0.485 (0.803)</b> C:69% T:84%	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

**Sample: S-BMW-1S**      **Lab ID: 60235474007**      Collected: 01/04/17 12:35      Received: 01/05/17 05:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0857 ± 0.391 (0.631)</b> C:NA T:87%	pCi/L	01/28/17 11:34	13982-63-3	
Radium-228	EPA 904.0	<b>0.545 ± 0.533 (1.10)</b> C:50% T:82%	pCi/L	01/30/17 16:08	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.399 ± 0.472 (0.741)</b> C:NA T:93%	pCi/L	01/28/17 11:34	13982-63-3	
Radium-228	EPA 904.0	<b>0.822 ± 0.480 (0.893)</b> C:60% T:91%	pCi/L	01/30/17 16:08	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 246431 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1211778 Matrix: Water

Associated Lab Samples: 60235474007, 60235474008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.423 (0.682) C:NA T:80%	pCi/L	01/28/17 11:18	

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

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 246439

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples:

METHOD BLANK: 1211785

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.117 ± 0.308 (0.692) C:65% T:91%	pCi/L	01/31/17 12:34	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 246438

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples:

METHOD BLANK: 1211784

Matrix: Water

Associated Lab Samples:

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.410 (0.661) C:NA T:80%	pCi/L	01/28/17 20:51	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 246435

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235457009, 60235457010

METHOD BLANK: 1211782

Matrix: Water

Associated Lab Samples: 60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235457009, 60235457010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.247 ± 0.377 (0.607) C:NA T:90%	pCi/L	01/28/17 19:22	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

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QC Batch:	246436	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235457009, 60235457010		

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METHOD BLANK:	1211783	Matrix:	Water
Associated Lab Samples:	60235457001, 60235457002, 60235457003, 60235457006, 60235457007, 60235457008, 60235457009, 60235457010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0628 ± 0.324 (0.745) C:61% T:84%	pCi/L	01/30/17 18:24	

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

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

QC Batch: 246432 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60235474007, 60235474008

METHOD BLANK: 1211779 Matrix: Water

Associated Lab Samples: 60235474007, 60235474008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.196 ± 0.401 (0.883) C:62% T:84%	pCi/L	01/30/17 16:07	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60235457001	S-TMW-1	EPA 200.7	461335	EPA 200.7	461385
60235457002	S-TMW-2	EPA 200.7	461335	EPA 200.7	461385
60235457003	S-TMW-3	EPA 200.7	461335	EPA 200.7	461385
60235457006	S-UG-3	EPA 200.7	461335	EPA 200.7	461385
60235457007	S-UWL-DUP-1	EPA 200.7	461335	EPA 200.7	461385
60235457008	S-UWL-FB-1	EPA 200.7	461335	EPA 200.7	461385
60235474007	S-BMW-1S	EPA 200.7	461335	EPA 200.7	461385
60235474008	S-BMW-3S	EPA 200.7	461335	EPA 200.7	461385
60235457001	S-TMW-1	EPA 200.8	461338	EPA 200.8	461386
60235457002	S-TMW-2	EPA 200.8	461338	EPA 200.8	461386
60235457003	S-TMW-3	EPA 200.8	461338	EPA 200.8	461386
60235457006	S-UG-3	EPA 200.8	461338	EPA 200.8	461386
60235457007	S-UWL-DUP-1	EPA 200.8	461338	EPA 200.8	461386
60235457008	S-UWL-FB-1	EPA 200.8	461338	EPA 200.8	461386
60235474007	S-BMW-1S	EPA 200.8	461338	EPA 200.8	461386
60235474008	S-BMW-3S	EPA 200.8	461338	EPA 200.8	461386
60235457001	S-TMW-1	EPA 7470	462059	EPA 7470	462081
60235457002	S-TMW-2	EPA 7470	462059	EPA 7470	462081
60235457003	S-TMW-3	EPA 7470	462059	EPA 7470	462081
60235457006	S-UG-3	EPA 7470	462059	EPA 7470	462081
60235457007	S-UWL-DUP-1	EPA 7470	462059	EPA 7470	462081
60235457008	S-UWL-FB-1	EPA 7470	462059	EPA 7470	462081
60235474007	S-BMW-1S	EPA 7470	461806	EPA 7470	461843
60235474008	S-BMW-3S	EPA 7470	461806	EPA 7470	461843
60235457001	S-TMW-1	EPA 903.1	246435		
60235457002	S-TMW-2	EPA 903.1	246435		
60235457003	S-TMW-3	EPA 903.1	246435		
60235457006	S-UG-3	EPA 903.1	246435		
60235457007	S-UWL-DUP-1	EPA 903.1	246435		
60235457008	S-UWL-FB-1	EPA 903.1	246435		
60235474007	S-BMW-1S	EPA 903.1	246431		
60235474008	S-BMW-3S	EPA 903.1	246431		
60235457009	S-TMW-3 MS	EPA 903.1	246435		
60235457010	S-TMW-3 MSD	EPA 903.1	246435		
60235457001	S-TMW-1	EPA 904.0	246436		
60235457002	S-TMW-2	EPA 904.0	246436		
60235457003	S-TMW-3	EPA 904.0	246436		
60235457006	S-UG-3	EPA 904.0	246436		
60235457007	S-UWL-DUP-1	EPA 904.0	246436		
60235457008	S-UWL-FB-1	EPA 904.0	246436		
60235474007	S-BMW-1S	EPA 904.0	246432		
60235474008	S-BMW-3S	EPA 904.0	246432		
60235457009	S-TMW-3 MS	EPA 904.0	246436		
60235457010	S-TMW-3 MSD	EPA 904.0	246436		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261462

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60235457001	S-TMW-1	SM 2540C	461340		
60235457002	S-TMW-2	SM 2540C	461340		
60235457003	S-TMW-3	SM 2540C	461340		
60235457006	S-UG-3	SM 2540C	461340		
60235457007	S-UWL-DUP-1	SM 2540C	461340		
60235457008	S-UWL-FB-1	SM 2540C	461340		
60235457008	S-UWL-FB-1	SM 2540C	461527		
60235474007	S-BMW-1S	SM 2540C	461337		
60235474008	S-BMW-3S	SM 2540C	461337		
60235457001	S-TMW-1	SM 4500-H+B	461642		
60235457002	S-TMW-2	SM 4500-H+B	461642		
60235457003	S-TMW-3	SM 4500-H+B	461642		
60235457006	S-UG-3	SM 4500-H+B	461642		
60235457007	S-UWL-DUP-1	SM 4500-H+B	461642		
60235457008	S-UWL-FB-1	SM 4500-H+B	461642		
60235474007	S-BMW-1S	SM 4500-H+B	461642		
60235474008	S-BMW-3S	SM 4500-H+B	461643		
60235457001	S-TMW-1	EPA 300.0	462745		
60235457001	S-TMW-1	EPA 300.0	462784		
60235457002	S-TMW-2	EPA 300.0	462745		
60235457002	S-TMW-2	EPA 300.0	462784		
60235457003	S-TMW-3	EPA 300.0	462745		
60235457003	S-TMW-3	EPA 300.0	462784		
60235457006	S-UG-3	EPA 300.0	462745		
60235457006	S-UG-3	EPA 300.0	462784		
60235457007	S-UWL-DUP-1	EPA 300.0	462745		
60235457007	S-UWL-DUP-1	EPA 300.0	462784		
60235457008	S-UWL-FB-1	EPA 300.0	462745		
60235474007	S-BMW-1S	EPA 300.0	462036		
60235474007	S-BMW-1S	EPA 300.0	462119		
60235474008	S-BMW-3S	EPA 300.0	462036		
60235474008	S-BMW-3S	EPA 300.0	462119		

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Sample Condition Upon Receipt

WO#: 60235457



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue  None  radiation

Cooler Temperature (°C): As-read 3.2/11.4/13.5 Corr. Factor CF +0.7 / CF +0.9 Corrected 3.9/12.1/14.2

Date and initials of person examining contents: BJS 1/5/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>wt</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_







Sample Condition Upon Receipt

WO#: 60235474



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet  Blue  None  radium

Cooler Temperature (°C): As-read \_\_\_\_\_ Corr. Factor CF +0.7 / CF +0.9 Corrected \_\_\_\_\_

Date and initials of person examining contents: BJS 1/5/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u> - SAMPLE S-BMW-3S on COC
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	has hand altered ID on containers
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	of S-BMW-3D collected @ 1429
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	- pre printed portion of label
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	says it is from Fly Ash site
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	- The hand written ID/time on
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	labels match a sample on
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Bottom Ash COC
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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	- possible mix up
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: Per client, sample S-BMW-2D should be S-BMW-3S @ 1520 and S-BMW-3S should be S-BMW-3D

Project Manager Review: Jami Check Date: 1/5/17





**CHAIN-OF-CUSTODY / Analytical Request Document**  
 The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Section A Required Client Information: Company: Golder Associates, Address: 820 South Main Street, Suite 100, St Charles, MO 63301, Phone: 636-724-9191, Fax: 636-724-9323, Requested Due Date/TAT: Standard

Section B Required Project Information: Report To: Mark Haddock (mhaddock@golder.com), Copy To: Jeffrey Ingram, Purchase Order No.: , Project Name: Ameren Sioux Energy Center - Fly Ash, Project Number: 153-1406.0003B

Section C Invoice Information: Attention: , Company Name: , Address: , Regulatory Agency: NPDES, RCRA, DRINKING WATER, OTHER: , Site Location: MO, State: MO, Pace Project Manager: Jamie Church, Pace Profile #: 9285

Page: 2 of 2

ITEM #	Section D Required Client Information	Valid Matrix Codes	COLLECTED		SAMPLE TYPE (G=GRA B=C=COMP)	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS
			MATRIX CODE	DATE		TIME	DATE	TIME	DATE			
1	S-LMW-DUP-2	DRINKING WATER DW	14/17	1620	G	John Sapping Golder	14/17	16:36	Glynn Ingram	14/17	16:36	Sealed Cooler (Y/N)
2	S-LMW-FB-1	WASTE WATER WW	14/17	1040	G	Glynn Ingram	15/17	0545	Randy	15/17	17:00	Temp in °C
3	S-LMW-FB-2	WASTE WATER WW	14/17	1455	G	Glynn Ingram	14/17	17:00	Randy	14/17	17:00	Received on Ice (Y/N)
4	S-LMN-FB-2	PRODUCT SOL/SOLID										Temp in °C
5		SOIL/SOLID										Received on Ice (Y/N)
6		OIL										Sealed Cooler (Y/N)
7		WATER										Samples Intact (Y/N)
8		WASTE WATER WW										
9		WASTE WATER WW										
10		WASTE WATER WW										
11		WASTE WATER WW										
12		WASTE WATER WW										

60235474  
 Pace Project No./ Lab I.D.  
 BAW B3W 28BW  
 010  
 011  
 012

SAMPLER NAME AND SIGNATURE: John (noted)  
 PRINT Name of SAMPLER: John (noted)  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed (MM/DD/YYYY): 01/04/17

March 03, 2017

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

RE: Project: AMEREN SIOUX ENERGY CENTER-FLY  
Pace Project No.: 60237185

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on February 03, 2017. 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.

REV-1, 3/3/17: Report revised to split samples into separate reports.

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

Sincerely,



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

Enclosures

cc: Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

---

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60237185002	S-BMW-3S	Water	02/02/17 11:22	02/03/17 03:55

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60237185002	S-BMW-3S	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	JMC1	1	PASI-K
	EPA 300.0	OL	3	PASI-K	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

**Sample: S-BMW-3S**      **Lab ID: 60237185002**      Collected: 02/02/17 11:22      Received: 02/03/17 03:55      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>146</b>	ug/L	5.0	0.58	1	02/03/17 16:15	02/06/17 16:23	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	02/03/17 16:15	02/06/17 16:23	7440-41-7	
Boron	<b>61.5J</b>	ug/L	100	50.0	1	02/03/17 16:15	02/06/17 16:23	7440-42-8	
Calcium	<b>127000</b>	ug/L	100	8.1	1	02/03/17 16:15	02/06/17 16:23	7440-70-2	
Cobalt	<b>2.2J</b>	ug/L	5.0	0.72	1	02/03/17 16:15	02/06/17 16:23	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	02/03/17 16:15	02/06/17 16:23	7439-92-1	
Lithium	<b>&lt;4.9</b>	ug/L	10.0	4.9	1	02/03/17 16:15	02/06/17 16:23	7439-93-2	
Molybdenum	<b>2.6J</b>	ug/L	20.0	0.52	1	02/03/17 16:15	02/06/17 16:23	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.22J</b>	ug/L	1.0	0.026	1	02/08/17 11:30	02/13/17 12:28	7440-36-0	B
Arsenic	<b>1.3</b>	ug/L	1.0	0.052	1	02/08/17 11:30	02/13/17 12:28	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	02/08/17 11:30	02/13/17 12:28	7440-43-9	
Chromium	<b>0.50J</b>	ug/L	1.0	0.054	1	02/08/17 11:30	02/13/17 12:28	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	02/08/17 11:30	02/13/17 12:28	7782-49-2	
Thallium	<b>0.041J</b>	ug/L	1.0	0.036	1	02/08/17 11:30	02/13/17 12:28	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>0.063J</b>	ug/L	0.20	0.039	1	02/06/17 09:45	02/06/17 13:17	7439-97-6	B
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>455</b>	mg/L	5.0	5.0	1		02/08/17 10:00		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.6</b>	Std. Units	0.10	0.10	1		02/13/17 12:44		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.0</b>	mg/L	1.0	0.50	1		02/04/17 17:07	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.027	1		02/04/17 17:07	16984-48-8	
Sulfate	<b>27.1</b>	mg/L	2.0	0.31	2		02/04/17 17:20	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 464462 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60237185002

METHOD BLANK: 1901187 Matrix: Water  
 Associated Lab Samples: 60237185002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	0.10J	0.20	0.039	02/06/17 12:42	

LABORATORY CONTROL SAMPLE: 1901188

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1901189 1901190

Parameter	Units	60236274001		1901189		1901190		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	0.12J	5	5	5	5.5	5.2	107	102	75-125	5	20

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-FLY  
 Pace Project No.: 60237185

QC Batch: 464383 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60237185002

METHOD BLANK: 1900682 Matrix: Water  
 Associated Lab Samples: 60237185002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	02/06/17 15:49	
Beryllium	ug/L	<0.16	1.0	0.16	02/06/17 15:49	
Boron	ug/L	<3.5	100	3.5	02/06/17 15:49	
Calcium	ug/L	<36.0	100	36.0	02/06/17 15:49	
Cobalt	ug/L	<0.73	5.0	0.73	02/06/17 15:49	
Lead	ug/L	<2.4	5.0	2.4	02/06/17 15:49	
Lithium	ug/L	<2.9	10.0	2.9	02/06/17 15:49	
Molybdenum	ug/L	<1.3	20.0	1.3	02/06/17 15:49	

LABORATORY CONTROL SAMPLE: 1900683

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	85-115	
Beryllium	ug/L	1000	1020	102	85-115	
Boron	ug/L	1000	932	93	85-115	
Calcium	ug/L	10000	9970	100	85-115	
Cobalt	ug/L	1000	1030	103	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	1060	106	85-115	
Molybdenum	ug/L	1000	1130	113	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1900684 1900685

Parameter	Units	60237217001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Barium	ug/L	0.075 mg/L	1000	1000	1080	1120	101	104	70-130	3	20		
Beryllium	ug/L	ND	1000	1000	1000	1030	100	103	70-130	3	20		
Boron	ug/L	ND	1000	1000	970	990	93	95	70-130	2	20		
Calcium	ug/L	43.4 mg/L	10000	10000	51200	53000	78	97	70-130	3	20		
Cobalt	ug/L	ND	1000	1000	994	1020	99	102	70-130	2	20		
Lead	ug/L	ND	1000	1000	987	1010	99	100	70-130	2	20		
Lithium	ug/L	ND	1000	1000	1040	1080	103	107	70-130	3	20		
Molybdenum	ug/L	ND	1000	1000	1120	1140	112	114	70-130	2	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

MATRIX SPIKE SAMPLE:		1900686					
Parameter	Units	60237222008 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	38.0	1000	1050	101	70-130	
Beryllium	ug/L	ND	1000	998	100	70-130	
Boron	ug/L	ND	1000	924	92	70-130	
Calcium	ug/L	17300	10000	26400	92	70-130	
Cobalt	ug/L	ND	1000	1000	100	70-130	
Lead	ug/L	ND	1000	1000	100	70-130	
Lithium	ug/L	ND	1000	1040	104	70-130	
Molybdenum	ug/L	ND	1000	1120	112	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 464778 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60237185002

METHOD BLANK: 1902182 Matrix: Water  
Associated Lab Samples: 60237185002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.18J	1.0	0.026	02/13/17 12:02	
Arsenic	ug/L	<0.052	1.0	0.052	02/13/17 12:02	
Cadmium	ug/L	<0.018	0.50	0.018	02/13/17 12:02	
Chromium	ug/L	<0.054	1.0	0.054	02/13/17 12:02	
Selenium	ug/L	<0.086	1.0	0.086	02/13/17 12:02	
Thallium	ug/L	<0.036	1.0	0.036	02/13/17 12:02	

LABORATORY CONTROL SAMPLE: 1902183

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.3	96	85-115	
Arsenic	ug/L	40	39.2	98	85-115	
Cadmium	ug/L	40	39.1	98	85-115	
Chromium	ug/L	40	40.5	101	85-115	
Selenium	ug/L	40	39.5	99	85-115	
Thallium	ug/L	40	36.9	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1902184 1902185

Parameter	Units	60237356001		60237356002		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Antimony	ug/L	0.25J	40	40	38.8	39.0	96	97	70-130	1	20	
Arsenic	ug/L	<0.052	40	40	39.1	38.9	98	97	70-130	1	20	
Cadmium	ug/L	<0.018	40	40	37.9	39.0	95	97	70-130	3	20	
Chromium	ug/L	0.66J	40	40	38.8	40.0	95	98	70-130	3	20	
Selenium	ug/L	<0.086	40	40	38.5	38.3	96	96	70-130	1	20	
Thallium	ug/L	<0.036	40	40	36.0	36.8	90	92	70-130	2	20	

MATRIX SPIKE SAMPLE: 1902186

Parameter	Units	60237356002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	1.4	40	39.9	96	70-130	
Arsenic	ug/L	2.9	40	41.8	97	70-130	
Cadmium	ug/L	1.7	40	39.1	94	70-130	
Chromium	ug/L	0.97J	40	38.8	95	70-130	
Selenium	ug/L	<0.086	40	38.3	96	70-130	
Thallium	ug/L	0.16J	40	36.1	90	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 464737

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60237185002

METHOD BLANK: 1902098

Matrix: Water

Associated Lab Samples: 60237185002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	02/08/17 10:00	

LABORATORY CONTROL SAMPLE: 1902099

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

SAMPLE DUPLICATE: 1902191

Parameter	Units	60237315002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3420	3580	5	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 464959 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60237185002

SAMPLE DUPLICATE: 1903138

Parameter	Units	60237044003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.3	6.3	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 464392	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60237185002	

METHOD BLANK: 1900744 Matrix: Water

Associated Lab Samples: 60237185002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	02/04/17 11:38	
Fluoride	mg/L	<0.027	0.20	0.027	02/04/17 11:38	
Sulfate	mg/L	<0.15	1.0	0.15	02/04/17 11:38	

LABORATORY CONTROL SAMPLE: 1900745

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	4.7	95	90-110	

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

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-BMW-3S</b> <b>Lab ID: 60237185002</b> Collected: 02/02/17 11:22      Received: 02/03/17 03:55      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>0.135 ± 0.530 (1.02)</b> <b>C:NA T:84%</b>	pCi/L	02/28/17 10:10	13982-63-3	
Radium-228	EPA 904.0	<b>0.625 ± 0.482 (0.939)</b> <b>C:57% T:82%</b>	pCi/L	03/01/17 19:19	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 249802

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60237185002

METHOD BLANK: 1229201

Matrix: Water

Associated Lab Samples: 60237185002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.065 ± 0.299 (0.608) C:NA T:90%	pCi/L	02/28/17 10:10	

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.

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

QC Batch: 249956

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60237185002

METHOD BLANK: 1229809

Matrix: Water

Associated Lab Samples: 60237185002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.993 ± 0.490 (0.830) C:56% T:84%	pCi/L	03/01/17 15:20	

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.

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

---

### 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.

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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-FLY

Pace Project No.: 60237185

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60237185002	S-BMW-3S	EPA 200.7	464383	EPA 200.7	464444
60237185002	S-BMW-3S	EPA 200.8	464778	EPA 200.8	464815
60237185002	S-BMW-3S	EPA 7470	464462	EPA 7470	464469
60237185002	S-BMW-3S	EPA 903.1	249802		
60237185002	S-BMW-3S	EPA 904.0	249956		
60237185002	S-BMW-3S	SM 2540C	464737		
60237185002	S-BMW-3S	SM 4500-H+B	464959		
60237185002	S-BMW-3S	EPA 300.0	464392		

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Sample Condition Upon Receipt

WO#: 60237185



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet  Blue  None

Cooler Temperature (°C): As-read 0.6/13.3 Corr. Factor CF +1.5 / CF +0.9 Corrected 2.1/14.8

Date and initials of person examining contents:

puz/3/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>JLS</u>

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_

**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

<b>Section A</b> Required Client Information:	<b>Section B</b> Required Project Information:	<b>Section C</b> Invoice Information:
Company: Golder Associates	Report To: Mark Haddock (mhaddock@golder.com)	Attention:
Address: 820 South Main Street, Suite 100	Copy To: Jeffrey Ingram	Company Name:
St Charles, MO 63301	Purchase Order No.: <i>FLYASH + Bottom Ash</i>	Address:
Email To: <a href="mailto:maddock@golder.com">maddock@golder.com</a>	Project Name: Ameren Sioux Energy Center - JMWL	Face Quote Reference:
Phone: 636-724-9191 Fax: 636-724-9323	Project Manager: Jamie Church	Face Project Manager:
Requested Due Date/TAT: Standard	Project Number: 153-1406.0003B + 0003A	Face Profile #:

Page: 1 of 2

ITEM #	Valid Matrix Codes MATRIX CODE DW: DRINKING WATER WT: WASTE WATER WW: WASTE WATER PRODUCT P: SOIL/SOLID OL: OIL WP: WP AT: AT TS: TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES	Analysis Test	Requested Analysis Filtered (Y/N)	Temp in °C	Received on Ice (Y/N)	Sealed Cooler (Y/N)	Samples Intact (Y/N)
				COMPOSITE START	COMPOSITE END/GRAB									
ADDITIONAL COMMENTS														
1	S-BMW-3D	WT G	G	2/1/17	1030	41	3	Unpreserved H <sub>2</sub> O <sub>2</sub> HNO <sub>3</sub> HCl	Metals* Chloride/Fluoride/Sulfate TDS PH Radium 226 & 228	Y				
2	S-BMW-3S	WT G	G	2/1/17	1122	41	3			Y				
3		WT G	G											
4		WT G	G											
5		WT G	G											
6		WT G	G											
7		WT G	G											
8		WT G	G											
9		WT G	G											
10		WT G	G											
11		WT G	G											
12		WT G	G											
				RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
				John Wozniak/Golder	2/2/17	12:15	Richard Ingram	2/2/17	12:15					
				Richard Ingram	2/2/17	17:30	Philip K...	2/3/2015	2:1					

SAMPLER NAME AND SIGNATURE		DATE Signed (MM/DD/YYYY):
PRINT Name of SAMPLER: John Wozniak		02/02/17
SIGNATURE of SAMPLER: [Signature]		

January 29, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261463

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between March 10, 2017 and March 11, 2017. 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.

REV-1, 1/29/18: Radium pulled in for S-UWL-DUP-1, S-UWL-FB-1, S-BMW-1S and S-BMW-3S.

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

---

### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60239561001	S-TMW-1	Water	03/10/17 08:20	03/11/17 03:20
60239561002	S-TMW-2	Water	03/10/17 09:20	03/11/17 03:20
60239561003	S-TMW-3	Water	03/10/17 10:11	03/11/17 03:20
60239561006	S-UG-3	Water	03/09/17 14:35	03/11/17 03:20
60239561013	S-TMW-1 MS	Water	03/10/17 08:20	03/11/17 03:20
60239561014	S-TMW-1 MSD	Water	03/10/17 08:20	03/11/17 03:20
60239561011	S-UWL-DUP-1	Water	03/10/17 08:00	03/11/17 03:20
60239561012	S-UWL-FB-1	Water	03/10/17 10:00	03/11/17 03:20
60239431010	S-BMW-1S	Water	03/08/17 12:40	03/10/17 03:45
60239431011	S-BMW-3S	Water	03/08/17 11:17	03/10/17 03:45

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60239561001	S-TMW-1	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60239561002	S-TMW-2	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60239561003	S-TMW-3	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60239561006	S-UG-3	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
60239561013	S-TMW-1 MS	EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60239561014	S-TMW-1 MSD	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60239561011	S-UWL-DUP-1	EPA 200.7	SMW	8	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
60239561012	S-UWL-FB-1	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
60239431010	S-BMW-1S	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60239431011	S-BMW-3S	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-1**      **Lab ID: 60239561001**      Collected: 03/10/17 08:20      Received: 03/11/17 03:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>196</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 18:47	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 18:47	7440-41-7	
Boron	<b>81.5J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 18:47	7440-42-8	B
Calcium	<b>109000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 18:47	7440-70-2	M1
Cobalt	<b>1.5J</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 18:47	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 18:47	7439-92-1	
Lithium	<b>25.4</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 18:47	7439-93-2	
Molybdenum	<b>3.0J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 18:47	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.17J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 16:35	7440-36-0	
Arsenic	<b>0.46J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 16:35	7440-38-2	
Cadmium	<b>0.031J</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 16:35	7440-43-9	
Chromium	<b>1.5</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 16:35	7440-47-3	B
Selenium	<b>0.56J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 16:35	7782-49-2	
Thallium	<b>0.037J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 16:35	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:10	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>379</b>	mg/L	5.0	5.0	1		03/15/17 13:04		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.8</b>	Std. Units	0.10	0.10	1		03/15/17 12:52		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.8</b>	mg/L	1.0	0.50	1		03/27/17 14:09	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.10	1		03/27/17 14:09	16984-48-8	
Sulfate	<b>38.0</b>	mg/L	5.0	2.5	5		03/27/17 14:53	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-2**      **Lab ID: 60239561002**      Collected: 03/10/17 09:20      Received: 03/11/17 03:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>222</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 18:53	7440-39-3	
Beryllium	<b>0.22J</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 18:53	7440-41-7	B
Boron	<b>95.2J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 18:53	7440-42-8	B
Calcium	<b>127000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 18:53	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 18:53	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 18:53	7439-92-1	
Lithium	<b>30.5</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 18:53	7439-93-2	
Molybdenum	<b>1.8J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 18:53	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.062J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 16:44	7440-36-0	
Arsenic	<b>6.0</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 16:44	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 16:44	7440-43-9	
Chromium	<b>1.6</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 16:44	7440-47-3	B
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 16:44	7782-49-2	
Thallium	<b>0.24J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 16:44	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:17	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>430</b>	mg/L	5.0	5.0	1		03/15/17 13:05		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.9</b>	Std. Units	0.10	0.10	1		03/14/17 13:07		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.7</b>	mg/L	1.0	0.50	1		03/27/17 16:06	16887-00-6	
Fluoride	<b>0.36</b>	mg/L	0.20	0.10	1		03/27/17 16:06	16984-48-8	
Sulfate	<b>33.2</b>	mg/L	2.0	1.0	2		03/27/17 16:21	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-3**      **Lab ID: 60239561003**      Collected: 03/10/17 10:11      Received: 03/11/17 03:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>328</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 18:57	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 18:57	7440-41-7	
Boron	<b>105</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 18:57	7440-42-8	B
Calcium	<b>148000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 18:57	7440-70-2	
Cobalt	<b>1.9J</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 18:57	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 18:57	7439-92-1	
Lithium	<b>36.2</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 18:57	7439-93-2	
Molybdenum	<b>2.4J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 18:57	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.12J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 16:57	7440-36-0	
Arsenic	<b>2.3</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 16:57	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 16:57	7440-43-9	
Chromium	<b>1.5</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 16:57	7440-47-3	B
Selenium	<b>0.13J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 16:57	7782-49-2	
Thallium	<b>0.059J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 16:57	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:31	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>493</b>	mg/L	5.0	5.0	1		03/15/17 13:05		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.9</b>	Std. Units	0.10	0.10	1		03/14/17 13:12		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.6</b>	mg/L	1.0	0.50	1		03/27/17 16:36	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.10	1		03/27/17 16:36	16984-48-8	
Sulfate	<b>60.9</b>	mg/L	5.0	2.5	5		03/27/17 16:51	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-UG-3**      **Lab ID: 60239561006**      Collected: 03/09/17 14:35      Received: 03/11/17 03:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>252</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 19:09	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 19:09	7440-41-7	
Boron	<b>468</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 19:09	7440-42-8	
Calcium	<b>144000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 19:09	7440-70-2	
Cobalt	<b>3.8J</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 19:09	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 19:09	7439-92-1	
Lithium	<b>29.1</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 19:09	7439-93-2	
Molybdenum	<b>2.5J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 19:09	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.19J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 17:06	7440-36-0	
Arsenic	<b>0.51J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 17:06	7440-38-2	
Cadmium	<b>0.27J</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 17:06	7440-43-9	
Chromium	<b>1.3</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 17:06	7440-47-3	B
Selenium	<b>3.3</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 17:06	7782-49-2	
Thallium	<b>0.055J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 17:06	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:38	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>570</b>	mg/L	5.0	5.0	1		03/14/17 14:46		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		03/13/17 15:08		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>71.9</b>	mg/L	5.0	2.5	5		03/27/17 18:04	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.10	1		03/27/17 18:48	16984-48-8	
Sulfate	<b>52.3</b>	mg/L	5.0	2.5	5		03/27/17 18:04	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-UWL-DUP-1**      **Lab ID: 60239561011**      Collected: 03/10/17 08:00      Received: 03/11/17 03:20      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>220</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/23/17 10:03	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/23/17 10:03	7440-41-7	
Boron	<b>86.2J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/23/17 10:03	7440-42-8	B
Calcium	<b>122000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/23/17 10:03	7440-70-2	
Cobalt	<b>0.95J</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/23/17 10:03	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/23/17 10:03	7439-92-1	
Lithium	<b>30.1</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/23/17 10:03	7439-93-2	
Molybdenum	<b>1.5J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/23/17 10:03	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.054J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 17:21	7440-36-0	
Arsenic	<b>5.6</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 17:21	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 17:21	7440-43-9	
Chromium	<b>1.4</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 17:21	7440-47-3	B
Selenium	<b>0.11J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 17:21	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 17:21	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:49	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>434</b>	mg/L	5.0	5.0	1		03/15/17 13:08		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		03/15/17 12:49		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.8</b>	mg/L	1.0	0.50	1		03/27/17 21:44	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.10	1		03/27/17 21:44	16984-48-8	
Sulfate	<b>31.7</b>	mg/L	5.0	2.5	5		03/27/17 21:00	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Sample: S-UWL-FB-1 Lab ID: 60239561012 Collected: 03/10/17 10:00 Received: 03/11/17 03:20 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<0.91	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 19:25	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 19:25	7440-41-7	
Boron	<3.5	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 19:25	7440-42-8	
Calcium	<36.0	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 19:25	7440-70-2	
Cobalt	<0.73	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 19:25	7440-48-4	
Lead	<2.4	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 19:25	7439-92-1	
Lithium	<2.9	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 19:25	7439-93-2	
Molybdenum	<1.3	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 19:25	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.026	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 17:37	7440-36-0	
Arsenic	<0.052	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 17:37	7440-38-2	
Cadmium	<0.018	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 17:37	7440-43-9	
Chromium	0.76J	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 17:37	7440-47-3	B
Selenium	<0.086	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 17:37	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 17:37	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.046	ug/L	0.20	0.046	1	03/16/17 11:50	03/16/17 16:51	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	10.5	mg/L	5.0	5.0	1		03/15/17 13:09		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.1	Std. Units	0.10	0.10	1		03/14/17 13:10		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		03/27/17 21:59	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		03/27/17 21:59	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		03/27/17 21:59	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-BMW-1S**      **Lab ID: 60239431010**      Collected: 03/08/17 12:40      Received: 03/10/17 03:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>151</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 18:24	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 18:24	7440-41-7	
Boron	<b>84.6J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 18:24	7440-42-8	
Calcium	<b>162000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 18:24	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 18:24	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 18:24	7439-92-1	
Lithium	<b>4.4J</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 18:24	7439-93-2	
Molybdenum	<b>1.4J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 18:24	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.076J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 16:07	7440-36-0	
Arsenic	<b>0.91J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 16:07	7440-38-2	
Cadmium	<b>0.12J</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 16:07	7440-43-9	
Chromium	<b>0.47J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 16:07	7440-47-3	B
Selenium	<b>0.37J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 16:07	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 16:07	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/15/17 09:30	03/15/17 12:28	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>532</b>	mg/L	5.0	5.0	1		03/13/17 13:38		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		03/13/17 12:10		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>9.7</b>	mg/L	1.0	0.50	1		03/14/17 20:10	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.10	1		03/14/17 20:10	16984-48-8	
Sulfate	<b>27.6</b>	mg/L	2.0	1.0	2		03/14/17 20:25	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-BMW-3S**      **Lab ID: 60239431011**      Collected: 03/08/17 11:17      Received: 03/10/17 03:45      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>124</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 18:31	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 18:31	7440-41-7	
Boron	<b>78.5J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 18:31	7440-42-8	B
Calcium	<b>134000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 18:31	7440-70-2	
Cobalt	<b>1.8J</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 18:31	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 18:31	7439-92-1	
Lithium	<b>6.0J</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 18:31	7439-93-2	
Molybdenum	<b>3.1J</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 18:31	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.042J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 16:26	7440-36-0	
Arsenic	<b>1.2</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 16:26	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 16:26	7440-43-9	
Chromium	<b>0.62J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 16:26	7440-47-3	B
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 16:26	7782-49-2	
Thallium	<b>0.092J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 16:26	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	03/15/17 09:30	03/15/17 12:30	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>455</b>	mg/L	5.0	5.0	1		03/13/17 13:38		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>6.9</b>	Std. Units	0.10	0.10	1		03/13/17 11:58		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.0</b>	mg/L	1.0	0.50	1		03/14/17 20:39	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.10	1		03/14/17 20:39	16984-48-8	
Sulfate	<b>26.1</b>	mg/L	2.0	1.0	2		03/14/17 20:53	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468828

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60239431010, 60239431011

METHOD BLANK: 1919006

Matrix: Water

Associated Lab Samples: 60239431010, 60239431011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	03/15/17 11:57	

LABORATORY CONTROL SAMPLE: 1919007

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1919008 1919009

Parameter	Units	60239431002		60239431008		60239431009		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Mercury	ug/L	<0.046	<0.046	5	5	4.8	4.8	95	94	75-125	0	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 469049

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

METHOD BLANK: 1919832

Matrix: Water

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	03/16/17 15:43	

LABORATORY CONTROL SAMPLE: 1919833

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1919834 1919835

Parameter	Units	60239561001		60239561006		60239561011		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec				
Mercury	ug/L	<0.046	5	5	4.7	5.3	94	107	75-125	13	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468651 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60239431010

METHOD BLANK: 1918411 Matrix: Water  
 Associated Lab Samples: 60239431010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	03/22/17 17:21	
Beryllium	ug/L	<0.16	1.0	0.16	03/22/17 17:21	
Boron	ug/L	<3.5	100	3.5	03/22/17 17:21	
Calcium	ug/L	<36.0	100	36.0	03/22/17 17:21	
Cobalt	ug/L	<0.73	5.0	0.73	03/22/17 17:21	
Lead	ug/L	<2.4	5.0	2.4	03/22/17 17:21	
Lithium	ug/L	<2.9	10.0	2.9	03/22/17 17:21	
Molybdenum	ug/L	<1.3	20.0	1.3	03/22/17 17:21	

LABORATORY CONTROL SAMPLE: 1918412

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	85-115	
Beryllium	ug/L	1000	1050	105	85-115	
Boron	ug/L	1000	993	99	85-115	
Calcium	ug/L	10000	10700	107	85-115	
Cobalt	ug/L	1000	1070	107	85-115	
Lead	ug/L	1000	1040	104	85-115	
Lithium	ug/L	1000	1040	104	85-115	
Molybdenum	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918413 1918414

Parameter	Units	60239429001		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Barium	ug/L	123	1000	1000	1170	1170	104	105	70-130	0	20	
Beryllium	ug/L	<0.16	1000	1000	1060	1060	106	106	70-130	0	20	
Boron	ug/L	325	1000	1000	1330	1350	100	102	70-130	1	20	
Calcium	ug/L	71600	10000	10000	81300	83200	97	117	70-130	2	20	
Cobalt	ug/L	<0.73	1000	1000	1030	1030	103	103	70-130	0	20	
Lead	ug/L	<2.4	1000	1000	1000	1000	100	100	70-130	0	20	
Lithium	ug/L	10.1	1000	1000	1060	1060	105	105	70-130	0	20	
Molybdenum	ug/L	35.7	1000	1000	1090	1090	106	106	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameter	Units	1918415		1918416		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60239431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Barium	ug/L	102	1000	1000	1160	1120	106	102	70-130	3	20	
Beryllium	ug/L	<0.16	1000	1000	1080	1040	108	104	70-130	4	20	
Boron	ug/L	394	1000	1000	1440	1400	104	101	70-130	2	20	
Calcium	ug/L	78200	10000	10000	90900	87900	127	98	70-130	3	20	
Cobalt	ug/L	1.1J	1000	1000	1070	1050	107	105	70-130	2	20	
Lead	ug/L	<2.4	1000	1000	1040	1020	104	102	70-130	2	20	
Lithium	ug/L	14.1	1000	1000	1080	1040	107	103	70-130	3	20	
Molybdenum	ug/L	75.0	1000	1000	1180	1160	110	108	70-130	2	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468654 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60239431011, 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

METHOD BLANK: 1918431 Matrix: Water  
 Associated Lab Samples: 60239431011, 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	03/22/17 18:28	
Beryllium	ug/L	0.18J	1.0	0.16	03/22/17 18:28	
Boron	ug/L	13.6J	100	3.5	03/22/17 18:28	
Calcium	ug/L	<36.0	100	36.0	03/22/17 18:28	
Cobalt	ug/L	<0.73	5.0	0.73	03/22/17 18:28	
Lead	ug/L	<2.4	5.0	2.4	03/22/17 18:28	
Lithium	ug/L	<2.9	10.0	2.9	03/22/17 18:28	
Molybdenum	ug/L	<1.3	20.0	1.3	03/22/17 18:28	

LABORATORY CONTROL SAMPLE: 1918432

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	85-115	
Beryllium	ug/L	1000	1030	103	85-115	
Boron	ug/L	1000	990	99	85-115	
Calcium	ug/L	10000	10600	106	85-115	
Cobalt	ug/L	1000	1060	106	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Molybdenum	ug/L	1000	1060	106	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918433 1918434

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60239561001 Result	Spike Conc.	Spike Conc.	MS Result						
Barium	ug/L	196	1000	1000	1220	1220	102	102	70-130	0	20
Beryllium	ug/L	<0.16	1000	1000	1040	1050	104	105	70-130	1	20
Boron	ug/L	81.5J	1000	1000	1080	1090	100	101	70-130	1	20
Calcium	ug/L	109000	10000	10000	114000	119000	49	103	70-130	5	20 M1
Cobalt	ug/L	1.5J	1000	1000	1020	1030	102	103	70-130	1	20
Lead	ug/L	<2.4	1000	1000	1000	1010	100	101	70-130	1	20
Lithium	ug/L	25.4	1000	1000	1060	1070	104	104	70-130	1	20
Molybdenum	ug/L	3.0J	1000	1000	1060	1060	106	106	70-130	0	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

MATRIX SPIKE SAMPLE:		1918435					
Parameter	Units	60239561002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	222	1000	1250	102	70-130	
Beryllium	ug/L	0.22J	1000	1050	105	70-130	
Boron	ug/L	95.2J	1000	1110	102	70-130	
Calcium	ug/L	127000	10000	135000	86	70-130	
Cobalt	ug/L	<0.73	1000	1040	104	70-130	
Lead	ug/L	<2.4	1000	1010	101	70-130	
Lithium	ug/L	30.5	1000	1080	105	70-130	
Molybdenum	ug/L	1.8J	1000	1080	108	70-130	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468653 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60239431010

METHOD BLANK: 1918422 Matrix: Water

Associated Lab Samples: 60239431010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	03/22/17 14:39	
Arsenic	ug/L	0.060J	1.0	0.052	03/22/17 14:39	
Cadmium	ug/L	<0.018	0.50	0.018	03/22/17 14:39	
Chromium	ug/L	0.27J	1.0	0.054	03/22/17 14:39	
Selenium	ug/L	<0.086	1.0	0.086	03/22/17 14:39	
Thallium	ug/L	<0.036	1.0	0.036	03/22/17 14:39	

LABORATORY CONTROL SAMPLE: 1918423

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.0	100	85-115	
Arsenic	ug/L	40	40.7	102	85-115	
Cadmium	ug/L	40	40.7	102	85-115	
Chromium	ug/L	40	40.5	101	85-115	
Selenium	ug/L	40	41.6	104	85-115	
Thallium	ug/L	40	36.6	91	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918424 1918425

Parameter	Units	60239429001		MSD		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	0.041J	40	40	41.3	41.1	103	103	70-130	0	20		
Arsenic	ug/L	1.1	40	40	42.2	42.1	103	103	70-130	0	20		
Cadmium	ug/L	<0.018	40	40	40.5	40.8	101	102	70-130	1	20		
Chromium	ug/L	1.5	40	40	41.0	42.0	99	101	70-130	2	20		
Selenium	ug/L	<0.086	40	40	40.5	39.2	101	98	70-130	3	20		
Thallium	ug/L	0.17J	40	40	37.8	38.6	94	96	70-130	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918426 1918427

Parameter	Units	60239431001		MSD		MSD		% Rec		Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	0.37J	40	40	41.3	41.3	102	102	70-130	0	20		
Arsenic	ug/L	1.8	40	40	42.8	42.7	102	102	70-130	0	20		
Cadmium	ug/L	0.047J	40	40	40.7	40.2	102	100	70-130	1	20		
Chromium	ug/L	0.52J	40	40	41.3	41.0	102	101	70-130	1	20		
Selenium	ug/L	1.4	40	40	40.8	40.9	98	99	70-130	0	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameter	Units	1918426		1918427		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60239431001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Thallium	ug/L	<0.036	40	40	38.0	38.4	95	96	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch:	468655	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60239431011, 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012		

METHOD BLANK: 1918437 Matrix: Water  
Associated Lab Samples: 60239431011, 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	03/22/17 16:19	
Arsenic	ug/L	<0.052	1.0	0.052	03/22/17 16:19	
Cadmium	ug/L	<0.018	0.50	0.018	03/22/17 16:19	
Chromium	ug/L	0.17J	1.0	0.054	03/22/17 16:19	
Selenium	ug/L	<0.086	1.0	0.086	03/22/17 16:19	
Thallium	ug/L	<0.036	1.0	0.036	03/22/17 16:19	

LABORATORY CONTROL SAMPLE: 1918438

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.2	100	85-115	
Arsenic	ug/L	40	40.8	102	85-115	
Cadmium	ug/L	40	41.2	103	85-115	
Chromium	ug/L	40	40.2	101	85-115	
Selenium	ug/L	40	41.5	104	85-115	
Thallium	ug/L	40	36.7	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918439 1918440

Parameter	Units	60239561001		60239561002		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.							
Antimony	ug/L	0.17J	40	40	41.0	41.2	102	103	70-130	1	20	
Arsenic	ug/L	0.46J	40	40	41.1	41.3	102	102	70-130	1	20	
Cadmium	ug/L	0.031J	40	40	40.8	40.7	102	102	70-130	0	20	
Chromium	ug/L	1.5	40	40	42.4	42.2	102	102	70-130	0	20	
Selenium	ug/L	0.56J	40	40	41.0	41.1	101	101	70-130	0	20	
Thallium	ug/L	0.037J	40	40	38.0	38.3	95	96	70-130	1	20	

MATRIX SPIKE SAMPLE: 1918441

Parameter	Units	60239561002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.062J	40	40.8	102	70-130	
Arsenic	ug/L	6.0	40	46.2	100	70-130	
Cadmium	ug/L	<0.018	40	40.6	102	70-130	
Chromium	ug/L	1.6	40	42.6	103	70-130	
Selenium	ug/L	<0.086	40	39.0	97	70-130	
Thallium	ug/L	0.24J	40	38.2	95	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468478

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60239431010, 60239431011

METHOD BLANK: 1917978

Matrix: Water

Associated Lab Samples: 60239431010, 60239431011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/13/17 13:31	

LABORATORY CONTROL SAMPLE: 1917979

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	985	99	80-120	

SAMPLE DUPLICATE: 1917980

Parameter	Units	60239532001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	893	956	7	10	

SAMPLE DUPLICATE: 1917981

Parameter	Units	60239431003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	581	576	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468693	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60239561006	

METHOD BLANK: 1918674 Matrix: Water

Associated Lab Samples: 60239561006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/14/17 14:41	

LABORATORY CONTROL SAMPLE: 1918675

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	980	98	80-120	

SAMPLE DUPLICATE: 1918676

Parameter	Units	60239456001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8800	8100	8	10	

SAMPLE DUPLICATE: 1918688

Parameter	Units	60239208016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	828	839	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468869

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561011, 60239561012

METHOD BLANK: 1919293

Matrix: Water

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561011, 60239561012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/15/17 13:02	

LABORATORY CONTROL SAMPLE: 1919294

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	99	80-120	

SAMPLE DUPLICATE: 1919295

Parameter	Units	60239561001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	379	379	0	10	

SAMPLE DUPLICATE: 1919296

Parameter	Units	60239561011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	434	435	0	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468451 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60239431010, 60239431011

SAMPLE DUPLICATE: 1917909

Parameter	Units	60239294001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.1	1	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468453 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60239561006

SAMPLE DUPLICATE: 1917912

Parameter	Units	60239429001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	1	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468569 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60239561001, 60239561011

SAMPLE DUPLICATE: 1918152

Parameter	Units	60239431001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.2	0	5	H6

SAMPLE DUPLICATE: 1918153

Parameter	Units	60239561001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.8	7.0	3	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468684 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60239561002, 60239561003, 60239561012

SAMPLE DUPLICATE: 1918583

Parameter	Units	60239604004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	6.4	6.7	4	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 468378 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60239431010, 60239431011

METHOD BLANK: 1917760 Matrix: Water

Associated Lab Samples: 60239431010, 60239431011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/14/17 09:33	
Fluoride	mg/L	<0.10	0.20	0.10	03/14/17 09:33	
Sulfate	mg/L	<0.50	1.0	0.50	03/14/17 09:33	

LABORATORY CONTROL SAMPLE: 1917761

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.3	105	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1917762 1917763

Parameter	Units	60239431001		60239431002		60239431003		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result					MS % Rec
Chloride	mg/L	18.8	18.8	5	5	24.9	25.2	123	128	80-120	1	15 M1
Fluoride	mg/L	0.28	0.28	2.5	2.5	3.0	3.1	109	114	80-120	4	15
Sulfate	mg/L	68.5	68.5	25	25	96.9	95.9	114	110	80-120	1	15

MATRIX SPIKE SAMPLE: 1917764

Parameter	Units	60239431002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	219	100	338	119	80-120	
Fluoride	mg/L	0.38	2.5	3.1	107	80-120	
Sulfate	mg/L	206	100	317	110	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 470281

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

METHOD BLANK: 1925324

Matrix: Water

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/27/17 11:21	
Fluoride	mg/L	<0.10	0.20	0.10	03/27/17 11:21	
Sulfate	mg/L	<0.50	1.0	0.50	03/27/17 11:21	

LABORATORY CONTROL SAMPLE: 1925325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1925326 1925327

Parameter	Units	60239561001		60239561002		60239561003		60239561006		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Chloride	mg/L	3.8	5	5	5	8.7	8.6	99	97	80-120	1	15	
Fluoride	mg/L	0.37	2.5	2.5	2.5	3.1	3.1	110	107	80-120	2	15	
Sulfate	mg/L	38.0	25	25	25	63.4	63.2	101	101	80-120	0	15	

MATRIX SPIKE SAMPLE: 1925328

Parameter	Units	60239910002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	356	100	466	110	80-120	
Fluoride	mg/L	<2.0	50	52.3	105	80-120	
Sulfate	mg/L	55.0	100	151	96	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-1**      **Lab ID: 60239561001**      Collected: 03/10/17 08:20      Received: 03/11/17 03:20      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.210 ± 0.292 (0.487)</b> C:NA T:97%	pCi/L	03/31/17 22:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.961 ± 0.458 (0.782)</b> C:69% T:84%	pCi/L	03/31/17 12:12	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-2**      **Lab ID: 60239561002**      Collected: 03/10/17 09:20      Received: 03/11/17 03:20      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.108 ± 0.335 (0.648)</b> <b>C:NA T:96%</b>	pCi/L	03/31/17 22:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.784 ± 0.461 (0.860)</b> <b>C:67% T:88%</b>	pCi/L	03/31/17 12:12	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-3**      **Lab ID: 60239561003**      Collected: 03/10/17 10:11      Received: 03/11/17 03:20      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.344 ± 0.358 (0.533)</b> <b>C:NA T:89%</b>	pCi/L	03/31/17 22:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.651 ± 0.470 (0.919)</b> <b>C:64% T:82%</b>	pCi/L	03/31/17 12:13	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.263 (0.536)</b> C:NA T:90%	pCi/L	03/31/17 22:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.674 ± 0.460 (0.886)</b> C:69% T:77%	pCi/L	03/31/17 12:12	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-TMW-1 MS**      **Lab ID: 60239561013**      Collected: 03/10/17 08:20      Received: 03/11/17 03:20      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>82.95 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	03/31/17 23:36	13982-63-3	
Radium-228	EPA 904.0	<b>101.71 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	03/31/17 12:13	15262-20-1	

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Sample: S-TMW-1 MSD		Lab ID: 60239561014	Collected: 03/10/17 08:20	Received: 03/11/17 03:20	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	104.94 %REC	23.41 RPD ±	pCi/L	03/31/17 23:37	13982-63-3	
		NA (NA)					
		C:NA T:NA					
Radium-228	EPA 904.0	119.28 %REC	15.9 RPD ±	pCi/L	03/31/17 12:13	15262-20-1	
		NA (NA)					
		C:NA T:NA					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.062 ± 0.282 (0.574)</b> <b>C:NA T:83%</b>	pCi/L	03/31/17 23:04	13982-63-3	
Radium-228	EPA 904.0	<b>0.521 ± 0.412 (0.817)</b> <b>C:71% T:81%</b>	pCi/L	03/31/17 12:14	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.248 (0.400)</b> C:NA T:97%	pCi/L	03/31/17 23:04	13982-63-3	
Radium-228	EPA 904.0	<b>-0.0772 ± 0.318 (0.768)</b> C:73% T:74%	pCi/L	03/31/17 12:15	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.112 ± 0.256 (0.413)</b> C:NA T:94%	pCi/L	03/31/17 21:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.295 ± 0.370 (0.785)</b> C:71% T:86%	pCi/L	03/30/17 14:52	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

**Sample: S-BMW-3S**      **Lab ID: 60239431011**      Collected: 03/08/17 11:17      Received: 03/10/17 03:45      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.217 ± 0.262 (0.399)</b> C:NA T:94%	pCi/L	03/31/17 21:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.335 ± 0.399 (0.840)</b> C:68% T:80%	pCi/L	03/30/17 14:52	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

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QC Batch:	252845	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012, 60239561013, 60239561014		

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METHOD BLANK:	1243925	Matrix:	Water
Associated Lab Samples:	60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012, 60239561013, 60239561014		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.197 ± 0.274 (0.458) C:NA T:98%	pCi/L	03/31/17 18:45	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

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QC Batch:	252841	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60239431010, 60239431011		

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METHOD BLANK:	1243919	Matrix:	Water
Associated Lab Samples:	60239431010, 60239431011		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.114 ± 0.317 (0.615) C:NA T:96%	pCi/L	03/31/17 20:35	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

QC Batch: 252848

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012, 60239561013, 60239561014

METHOD BLANK: 1243930

Matrix: Water

Associated Lab Samples: 60239561001, 60239561002, 60239561003, 60239561006, 60239561011, 60239561012, 60239561013, 60239561014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.452 ± 0.369 (0.731) C:71% T:80%	pCi/L	03/31/17 12:14	

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.

### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

---

QC Batch:	252843	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60239431010, 60239431011		

---

METHOD BLANK:	1243920	Matrix:	Water
Associated Lab Samples:	60239431010, 60239431011		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.287 ± 0.291 (0.594) C:67% T:92%	pCi/L	03/30/17 11:14	

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

### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

---

### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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

## REPORT OF LABORATORY ANALYSIS

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without the written consent of Pace Analytical Services, LLC.

### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60239431010	S-BMW-1S	EPA 200.7	468651	EPA 200.7	468726
60239431011	S-BMW-3S	EPA 200.7	468654	EPA 200.7	468728
60239561001	S-TMW-1	EPA 200.7	468654	EPA 200.7	468728
60239561002	S-TMW-2	EPA 200.7	468654	EPA 200.7	468728
60239561003	S-TMW-3	EPA 200.7	468654	EPA 200.7	468728
60239561006	S-UG-3	EPA 200.7	468654	EPA 200.7	468728
60239561011	S-UWL-DUP-1	EPA 200.7	468654	EPA 200.7	468728
60239561012	S-UWL-FB-1	EPA 200.7	468654	EPA 200.7	468728
60239431010	S-BMW-1S	EPA 200.8	468653	EPA 200.8	468727
60239431011	S-BMW-3S	EPA 200.8	468655	EPA 200.8	468730
60239561001	S-TMW-1	EPA 200.8	468655	EPA 200.8	468730
60239561002	S-TMW-2	EPA 200.8	468655	EPA 200.8	468730
60239561003	S-TMW-3	EPA 200.8	468655	EPA 200.8	468730
60239561006	S-UG-3	EPA 200.8	468655	EPA 200.8	468730
60239561011	S-UWL-DUP-1	EPA 200.8	468655	EPA 200.8	468730
60239561012	S-UWL-FB-1	EPA 200.8	468655	EPA 200.8	468730
60239431010	S-BMW-1S	EPA 7470	468828	EPA 7470	468842
60239431011	S-BMW-3S	EPA 7470	468828	EPA 7470	468842
60239561001	S-TMW-1	EPA 7470	469049	EPA 7470	469085
60239561002	S-TMW-2	EPA 7470	469049	EPA 7470	469085
60239561003	S-TMW-3	EPA 7470	469049	EPA 7470	469085
60239561006	S-UG-3	EPA 7470	469049	EPA 7470	469085
60239561011	S-UWL-DUP-1	EPA 7470	469049	EPA 7470	469085
60239561012	S-UWL-FB-1	EPA 7470	469049	EPA 7470	469085
60239431010	S-BMW-1S	EPA 903.1	252841		
60239431011	S-BMW-3S	EPA 903.1	252841		
60239561001	S-TMW-1	EPA 903.1	252845		
60239561002	S-TMW-2	EPA 903.1	252845		
60239561003	S-TMW-3	EPA 903.1	252845		
60239561006	S-UG-3	EPA 903.1	252845		
60239561011	S-UWL-DUP-1	EPA 903.1	252845		
60239561012	S-UWL-FB-1	EPA 903.1	252845		
60239561013	S-TMW-1 MS	EPA 903.1	252845		
60239561014	S-TMW-1 MSD	EPA 903.1	252845		
60239431010	S-BMW-1S	EPA 904.0	252843		
60239431011	S-BMW-3S	EPA 904.0	252843		
60239561001	S-TMW-1	EPA 904.0	252848		
60239561002	S-TMW-2	EPA 904.0	252848		
60239561003	S-TMW-3	EPA 904.0	252848		
60239561006	S-UG-3	EPA 904.0	252848		
60239561011	S-UWL-DUP-1	EPA 904.0	252848		
60239561012	S-UWL-FB-1	EPA 904.0	252848		
60239561013	S-TMW-1 MS	EPA 904.0	252848		
60239561014	S-TMW-1 MSD	EPA 904.0	252848		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60239431010	S-BMW-1S	SM 2540C	468478		
60239431011	S-BMW-3S	SM 2540C	468478		
60239561001	S-TMW-1	SM 2540C	468869		
60239561002	S-TMW-2	SM 2540C	468869		
60239561003	S-TMW-3	SM 2540C	468869		
60239561006	S-UG-3	SM 2540C	468693		
60239561011	S-UWL-DUP-1	SM 2540C	468869		
60239561012	S-UWL-FB-1	SM 2540C	468869		
60239431010	S-BMW-1S	SM 4500-H+B	468451		
60239431011	S-BMW-3S	SM 4500-H+B	468451		
60239561001	S-TMW-1	SM 4500-H+B	468569		
60239561002	S-TMW-2	SM 4500-H+B	468684		
60239561003	S-TMW-3	SM 4500-H+B	468684		
60239561006	S-UG-3	SM 4500-H+B	468453		
60239561011	S-UWL-DUP-1	SM 4500-H+B	468569		
60239561012	S-UWL-FB-1	SM 4500-H+B	468684		
60239431010	S-BMW-1S	EPA 300.0	468378		
60239431011	S-BMW-3S	EPA 300.0	468378		
60239561001	S-TMW-1	EPA 300.0	470281		
60239561002	S-TMW-2	EPA 300.0	470281		
60239561003	S-TMW-3	EPA 300.0	470281		
60239561006	S-UG-3	EPA 300.0	470281		
60239561011	S-UWL-DUP-1	EPA 300.0	470281		
60239561012	S-UWL-FB-1	EPA 300.0	470281		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60239561



60239561

Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 T-239 Type of Ice: Wet Blue  None

Cooler Temperature (°C): As-read 0-2/4.6 Corr. Factor CF +1.5 CF +0.9 Corrected 1.7/16.1/5.6

Date and initials of person examining contents:

Temperature should be above freezing to 6°C 14.1

PV 3/11/17

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jami Chack \_\_\_\_\_ Date: 3/13/17

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_





# CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A**  
 Required Client Information:  
 Company: Golder Associates  
 Address: 820 South Main Street, Suite 100  
 St Charles, MO 63301  
 Email To: maddock@golder.com  
 Phone: 636-724-9191 Fax: 636-724-9323  
 Requested Due Date/TAT: Standard

**Section B**  
 Required Project Information:  
 Report To: Mark Haddock (mhaddock@golder.com)  
 Copy To: Jeffrey Ingram  
 Purchase Order No.:  
 Project Name: Ameren Sioux Energy Center - UWL  
 Project Number: 153-1406.0003B

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: Jamie Church  
 Pace Profile #: 9285  
 Site Location: MO  
 STATE: MO

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	PRESERVATIVES	ANALYSIS TEST	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		COMPOSITE START	COMPOSITE END/GRAB								
1	S-TMW-1	3/10/17	820	G	WT G	12	H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Metals Chloride/Fluoride/Sulfate TDS pH Radium 226 & 228	Y		60739561
2	S-TMW-2	3/10/17	920	G	WT G	4	Unpreserved				601
3	S-TMW-3	3/10/17	1011	G	WT G	1					1823N 1824N 2821N 002
4	S-UG-1A	3/9/17	1400	G	WT G	1					603
5	S-UG-2	3/10/17	1510	G	WT G	1					604
6	S-UG-3	3/10/17	1435	G	WT G	1					605
7	S-DG-1	3/10/17	1315	G	WT G	1					606
8	S-DG-2	3/10/17	1235	G	WT G	1					607
9	S-DG-3	3/10/17	1153	G	WT G	1					608
10	S-DG-4	3/10/17	1058	G	WT G	1					010
11	S-UWL-DUP-1	3/10/17	1000	G	WT G	1					011
12	S-UWL-FB-1	3/10/17	1000	G	WT G	1					012

**ADDITIONAL COMMENTS**  
 \*EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg  
 EPA 200.8: Sb, As, Cd, Cr, Se, Tl

**RELINQUISHED BY / AFFILIATION**  
 3/10/17 1500 Richard M. King  
 3/10/17 1700 Jennifer King

**ACCEPTED BY / AFFILIATION**  
 3/10/17 14:45  
 3/10/17 0320:17  
 16.1  
 15.6

**DATE**  
 3/10/17  
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**TIME**  
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**DATE**  
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 3/10/17

**TEMP IN °C**  
 16.1  
 15.6

**SAMPLE CONDITIONS**  
 Received on Ice (Y/N)  
 Custody Sealed (Y/N)  
 Samples Intact (Y/N)

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: Jeff Ingram  
 SIGNATURE of SAMPLER: [Signature]

**DATE Signed (MM/DD/YYYY):** 3/10/17



Sample Condition Upon Receipt

WO#: 60239431



Client Name: Golden

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  Nope  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 03/12.4 Corr. Factor CF +1.5 / CF +0.9 Corrected 1-8/14.1/13.9

Date and initials of person examining contents: 3/10/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Chack \_\_\_\_\_ Date: 3/10/17





**CHAIN-OF-CUSTODY / Analytical Request Document**

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

**Section A**  
 Required Client Information:  
 Company: **Goldier Associates**  
 Address: **820 South Main Street, Suite 100**  
**St Charles, MO 63301**  
 Email To: **maddock@goldier.com**  
 Phone: **636-724-9191** Fax: **636-724-9323**  
 Requested Due Date/TAT: **Standard**

**Section B**  
 Required Project Information:  
 Report To: **Mark Haddock (mhaddock@goldier.com)**  
 Copy To: **Jeffrey Ingram**  
 Purchase Order No.:  
 Project Name: **Ameren Sioux Energy Center - Fly Ash**  
 Project Number: **153-1406.0003B**

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 NPDES  GROUND WATER  DRINKING WATER   
 UST  RCRA  OTHER   
 Site Location  MO   
 STATE:

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW WASTEWATER PRODUCT P SOIL/SOLID SL OIL OL WP WP AR AR OT OT TS TS	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> Methanol Other	Analysis Test Y/N Metals Chloride/Fluoride/Sulfate TDS pH Radium 226 & 228	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB							
1	S-LMW-DUP-2	WT G	DATE 3/14/17	TIME -	4	H <sub>2</sub> SO <sub>4</sub> 3	Metals	N			18824 1824 2891N 013
2	S-LMW-FB-1	WT G	DATE 3/14/17	TIME -	1	H <sub>2</sub> SO <sub>4</sub> 1	Metals	N			18824 1824 2891N 013
3	S-LMW-FB-2	WT G	DATE 3/14/17	TIME -	1	H <sub>2</sub> SO <sub>4</sub> 1	Metals	N			18824 1824 2891N 013
4											
5											
6											
7											
8											
9											
10											
11											
12											

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 1470A-Hg EPA 200.8: Sb, As, Cd, Cr, Se, Tl	<i>[Signature]</i>	3/14/17	1630	<i>[Signature]</i>	3/17/17	1620	Received on Ice (Y/N) X Sealed Cooler (Y/N) X Custody (Y/N) X Samples intact (Y/N) X
	<i>[Signature]</i>	3/17/17	1700	<i>[Signature]</i>	3/17/17	0345	Temp in °C 4.1 13.9

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: *[Signature]*  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YYYY): 3/17/17

April 26, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR - FLY  
Pace Project No.: 60241394

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 2017. 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,



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

Enclosures

cc: Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60241394001	S-BMW-3S	Water	04/05/17 10:53	04/06/17 03:50

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60241394001	S-BMW-3S	EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

**Sample: S-BMW-3S**      **Lab ID: 60241394001**      Collected: 04/05/17 10:53      Received: 04/06/17 03:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>118</b>	ug/L	5.0	0.91	1	04/10/17 12:00	04/13/17 13:13	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	04/10/17 12:00	04/13/17 13:13	7440-41-7	
Boron	<b>68.8J</b>	ug/L	100	3.5	1	04/10/17 12:00	04/13/17 13:13	7440-42-8	
Calcium	<b>122000</b>	ug/L	100	36.0	1	04/10/17 12:00	04/13/17 13:13	7440-70-2	
Cobalt	<b>1.9J</b>	ug/L	5.0	0.73	1	04/10/17 12:00	04/13/17 13:13	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	04/10/17 12:00	04/13/17 13:13	7439-92-1	
Lithium	<b>8.7J</b>	ug/L	10.0	2.9	1	04/10/17 12:00	04/13/17 13:13	7439-93-2	
Molybdenum	<b>4.8J</b>	ug/L	20.0	1.3	1	04/10/17 12:00	04/13/17 13:13	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.033J</b>	ug/L	1.0	0.026	1	04/07/17 10:40	04/10/17 12:41	7440-36-0	
Arsenic	<b>0.89J</b>	ug/L	1.0	0.052	1	04/07/17 10:40	04/10/17 12:41	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	04/07/17 10:40	04/10/17 12:41	7440-43-9	
Chromium	<b>0.32J</b>	ug/L	1.0	0.054	1	04/07/17 10:40	04/10/17 12:41	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	04/07/17 10:40	04/11/17 13:17	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	04/07/17 10:40	04/10/17 12:41	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	04/06/17 15:30	04/07/17 10:29	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>447</b>	mg/L	5.0	5.0	1		04/06/17 15:39		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.7</b>	Std. Units	0.10	0.10	1		04/13/17 13:07		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10</b>	mg/L	1.0	0.50	1		04/07/17 16:28	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.10	1		04/07/17 16:28	16984-48-8	
Sulfate	<b>27.6</b>	mg/L	2.0	1.0	2		04/07/17 16:42	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 471728

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60241394001

METHOD BLANK: 1931494

Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	04/07/17 10:14	

LABORATORY CONTROL SAMPLE: 1931495

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.2	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931496 1931497

Parameter	Units	60241393001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	<0.046	5	5	5	5	4.9	4.9	98	98	75-125	0	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 472060 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60241394001

METHOD BLANK: 1933194 Matrix: Water  
 Associated Lab Samples: 60241394001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	04/13/17 12:34	
Beryllium	ug/L	<0.16	1.0	0.16	04/13/17 12:34	
Boron	ug/L	<3.5	100	3.5	04/13/17 12:34	
Calcium	ug/L	<36.0	100	36.0	04/13/17 12:34	
Cobalt	ug/L	<0.73	5.0	0.73	04/13/17 12:34	
Lead	ug/L	<2.4	5.0	2.4	04/13/17 12:34	
Lithium	ug/L	<2.9	10.0	2.9	04/13/17 12:34	
Molybdenum	ug/L	<1.3	20.0	1.3	04/13/17 12:34	

LABORATORY CONTROL SAMPLE: 1933195

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	85-115	
Beryllium	ug/L	1000	1040	104	85-115	
Boron	ug/L	1000	1040	104	85-115	
Calcium	ug/L	10000	9700	97	85-115	
Cobalt	ug/L	1000	1080	108	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	1090	109	85-115	
Molybdenum	ug/L	1000	1110	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1933196 1933197

Parameter	Units	60241357001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Barium	ug/L	23.0	1000	1000	1060	1060	104	104	70-130	1	20		
Beryllium	ug/L	ND	1000	1000	1030	1040	103	103	70-130	1	20		
Boron	ug/L	3120	1000	1000	4120	4150	101	103	70-130	1	20		
Calcium	ug/L	30200	10000	10000	39000	38800	88	85	70-130	1	20		
Cobalt	ug/L	ND	1000	1000	1010	1020	101	102	70-130	1	20		
Lead	ug/L	ND	1000	1000	928	940	93	94	70-130	1	20		
Lithium	ug/L	17.7	1000	1000	1110	1120	109	111	70-130	1	20		
Molybdenum	ug/L	116	1000	1000	1200	1220	108	110	70-130	2	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

MATRIX SPIKE SAMPLE:		1933198					
Parameter	Units	60241525001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	124	1000	1170	104	70-130	
Beryllium	ug/L	ND	1000	1040	104	70-130	
Boron	ug/L	166	1000	1230	107	70-130	
Calcium	ug/L	91500	10000	101000	94	70-130	
Cobalt	ug/L	ND	1000	1060	105	70-130	
Lead	ug/L	121	1000	1110	99	70-130	
Lithium	ug/L	17.2	1000	1120	110	70-130	
Molybdenum	ug/L	29.9	1000	1140	111	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 471820 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60241394001

METHOD BLANK: 1931891 Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	04/10/17 10:38	
Arsenic	ug/L	<0.052	1.0	0.052	04/10/17 10:38	
Cadmium	ug/L	<0.018	0.50	0.018	04/10/17 10:38	
Chromium	ug/L	<0.054	1.0	0.054	04/10/17 10:38	
Selenium	ug/L	<0.086	1.0	0.086	04/11/17 12:15	
Thallium	ug/L	<0.036	1.0	0.036	04/10/17 10:38	

LABORATORY CONTROL SAMPLE: 1931892

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.2	100	85-115	
Arsenic	ug/L	40	40.4	101	85-115	
Cadmium	ug/L	40	40.4	101	85-115	
Chromium	ug/L	40	41.4	103	85-115	
Selenium	ug/L	40	40.9	102	85-115	
Thallium	ug/L	40	37.5	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931893 1931894

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		7563209001 Result	Spike Conc.	Spike Conc.	MS Result						
Antimony	ug/L	ND	40	40	41.7	41.5	103	103	70-130	0	20
Arsenic	ug/L	1.6	40	40	41.8	42.4	100	102	70-130	2	20
Cadmium	ug/L	ND	40	40	39.3	38.7	98	97	70-130	1	20
Chromium	ug/L	2.0	40	40	42.5	42.3	101	101	70-130	0	20
Selenium	ug/L	ND	40	40	35.6	36.2	88	90	70-130	1	20
Thallium	ug/L	ND	40	40	37.6	37.8	94	94	70-130	0	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931895 1931896

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		7563209002 Result	Spike Conc.	Spike Conc.	MS Result						
Antimony	ug/L	ND	40	40	42.3	42.2	104	104	70-130	0	20
Arsenic	ug/L	1.6	40	40	42.4	42.5	102	102	70-130	0	20
Cadmium	ug/L	ND	40	40	39.8	39.6	99	99	70-130	1	20
Chromium	ug/L	2.9	40	40	43.6	43.7	102	102	70-130	0	20
Selenium	ug/L	ND	40	40	35.9	33.8	89	84	70-130	6	20

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931895												1931896	
Parameter	Units	7563209002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD	
Thallium	ug/L	ND	40	40	38.2	38.1	95	95	70-130	0	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931897												1931898	
Parameter	Units	7563209003 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD	
Antimony	ug/L	ND	40	40	42.4	42.3	105	105	70-130	0	20		
Arsenic	ug/L	1.4	40	40	42.7	42.6	103	103	70-130	0	20		
Cadmium	ug/L	ND	40	40	39.1	39.3	98	98	70-130	1	20		
Chromium	ug/L	6.9	40	40	47.7	48.1	102	103	70-130	1	20		
Selenium	ug/L	ND	40	40	36.0	34.9	88	86	70-130	3	20		
Thallium	ug/L	ND	40	40	38.2	38.5	95	96	70-130	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931899												1931900	
Parameter	Units	7563209004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual		
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD	
Antimony	ug/L	ND	40	40	41.9	41.8	104	104	70-130	0	20		
Arsenic	ug/L	1.1	40	40	41.8	42.1	102	103	70-130	1	20		
Cadmium	ug/L	ND	40	40	39.4	38.9	98	97	70-130	1	20		
Chromium	ug/L	4.5	40	40	44.5	45.3	100	102	70-130	2	20		
Selenium	ug/L	ND	40	40	31.2	32.3	77	79	70-130	3	20		
Thallium	ug/L	ND	40	40	38.1	38.0	95	95	70-130	0	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 471744

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60241394001

METHOD BLANK: 1931522

Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/06/17 15:35	

LABORATORY CONTROL SAMPLE: 1931523

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	969	97	80-120	

SAMPLE DUPLICATE: 1931524

Parameter	Units	60241391001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8970	9970	11	10 D6	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 472464 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60241394001

SAMPLE DUPLICATE: 1934648

Parameter	Units	60241544001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.2	1	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 471826 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60241394001

METHOD BLANK: 1931915 Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	04/07/17 08:23	
Fluoride	mg/L	<0.10	0.20	0.10	04/07/17 08:23	
Sulfate	mg/L	<0.50	1.0	0.50	04/07/17 08:23	

LABORATORY CONTROL SAMPLE: 1931916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931917 1931918

Parameter	Units	60241481001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Chloride	mg/L	1320	1000	1000	2380	2340	106	101	80-120	2	15				
Fluoride	mg/L	ND	500	500	551	542	105	103	80-120	2	15				
Sulfate	mg/L	ND	1000	1000	1100	1110	98	99	80-120	1	15				

MATRIX SPIKE SAMPLE: 1931980

Parameter	Units	60241472004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	2730	1000	3860	113	80-120	
Fluoride	mg/L	ND	500	533	107	80-120	
Sulfate	mg/L	3890	1000	4940	105	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

**Sample: S-BMW-3S**      **Lab ID: 60241394001**      Collected: 04/05/17 10:53      Received: 04/06/17 03:50      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.548 ± 0.513 (0.727)</b> C:NA T:91%	pCi/L	04/24/17 22:21	13982-63-3	
Radium-228	EPA 904.0	<b>0.316 ± 0.318 (0.659)</b> C:83% T:87%	pCi/L	04/24/17 16:37	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

QC Batch: 255654

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60241394001

METHOD BLANK: 1259160

Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.321 ± 0.447 (0.746) C:NA T:88%	pCi/L	04/24/17 22:04	

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

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**QUALITY CONTROL - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

---

QC Batch: 255790	Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0	Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60241394001	

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METHOD BLANK: 1259874 Matrix: Water

Associated Lab Samples: 60241394001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.408 ± 0.295 (0.566) C:85% T:82%	pCi/L	04/24/17 16:37	

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

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

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### 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.

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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

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

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR - FLY

Pace Project No.: 60241394

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60241394001	S-BMW-3S	EPA 200.7	472060	EPA 200.7	472122
60241394001	S-BMW-3S	EPA 200.8	471820	EPA 200.8	471945
60241394001	S-BMW-3S	EPA 7470	471728	EPA 7470	471775
60241394001	S-BMW-3S	EPA 903.1	255654		
60241394001	S-BMW-3S	EPA 904.0	255790		
60241394001	S-BMW-3S	SM 2540C	471744		
60241394001	S-BMW-3S	SM 4500-H+B	472464		
60241394001	S-BMW-3S	EPA 300.0	471826		

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Sample Condition Upon Receipt

WO#: 60241394



60241394

JLS

Client Name: Goldier

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.9/1.9 Corr. Factor CF +1.5 / CF +0.9 Corrected 2.4/13.4

Date and initials of person examining contents:

2/4/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>pH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks: <input checked="" type="checkbox"/> N/A		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Check \_\_\_\_\_ Date: 4/6/17





January 29, 2018

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

RE: Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261465

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on June 07, 2017. 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.

REV-1, 1/29/18: Radium pulled in for S-UWL-DUP-1, S-UWL-FB-1, S-BMW-1S and S-BMW-3S.

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

Sincerely,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60245849001	S-TMW-1	Water	06/06/17 11:20	06/07/17 04:25
60245849002	S-TMW-2	Water	06/06/17 10:45	06/07/17 04:25
60245849003	S-TMW-3	Water	06/06/17 09:47	06/07/17 04:25
60245849006	S-UG-3	Water	06/06/17 12:05	06/07/17 04:25
60245849011	S-UWL-DUP-1	Water	06/06/17 08:00	06/07/17 04:25
60245849012	S-UWL-FB-1	Water	06/06/17 09:20	06/07/17 04:25
60245853001	S-BMW-3S	Water	06/05/17 14:07	06/07/17 04:25
60245853002	S-BMW-1S	Water	06/05/17 15:10	06/07/17 04:25

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60245849001	S-TMW-1	EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60245849002	S-TMW-2	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60245849003	S-TMW-3	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60245849006	S-UG-3	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
60245849011	S-UWL-DUP-1	EPA 904.0	VAL	1	PASI-PA
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60245849012	S-UWL-FB-1	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60245853001	S-BMW-3S	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60245853002	S-BMW-1S	EPA 300.0	RAD	3	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	RAD	3	PASI-K

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-TMW-1**      **Lab ID: 60245849001**      Collected: 06/06/17 11:20      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>207</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 16:33	7440-39-3	
Beryllium	<b>0.47J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 16:33	7440-41-7	B
Boron	<b>56.0J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 16:33	7440-42-8	
Calcium	<b>99600</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 16:33	7440-70-2	
Cobalt	<b>0.91J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 16:33	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 16:33	7439-92-1	
Lithium	<b>24.8</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 16:33	7439-93-2	B
Molybdenum	<b>3.0J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 16:33	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.20J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:03	7440-36-0	
Arsenic	<b>0.38J</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:03	7440-38-2	
Cadmium	<b>0.041J</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:03	7440-43-9	
Chromium	<b>0.12J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:03	7440-47-3	
Selenium	<b>0.22J</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:03	7782-49-2	
Thallium	<b>0.087J</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:03	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 14:38	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>381</b>	mg/L	5.0	5.0	1		06/08/17 08:07		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		06/09/17 10:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.8</b>	mg/L	1.0	0.50	1		06/09/17 13:17	16887-00-6	
Fluoride	<b>0.28</b>	mg/L	0.20	0.10	1		06/09/17 13:17	16984-48-8	
Sulfate	<b>27.4</b>	mg/L	5.0	2.5	5		06/09/17 12:31	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-TMW-2**      **Lab ID: 60245849002**      Collected: 06/06/17 10:45      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>214</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 16:36	7440-39-3	
Beryllium	<b>0.35J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 16:36	7440-41-7	B
Boron	<b>67.7J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 16:36	7440-42-8	
Calcium	<b>105000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 16:36	7440-70-2	
Cobalt	<b>1.9J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 16:36	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 16:36	7439-92-1	
Lithium	<b>28.8</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 16:36	7439-93-2	B
Molybdenum	<b>2.6J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 16:36	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.050J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:06	7440-36-0	
Arsenic	<b>4.6</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:06	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:06	7440-43-9	
Chromium	<b>0.15J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:06	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:06	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:06	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>0.053J</b>	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 14:41	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>408</b>	mg/L	5.0	5.0	1		06/08/17 08:07		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		06/09/17 09:57		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.4</b>	mg/L	1.0	0.50	1		06/09/17 13:33	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.10	1		06/09/17 13:33	16984-48-8	
Sulfate	<b>31.1</b>	mg/L	2.0	1.0	2		06/09/17 13:48	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-TMW-3**      **Lab ID: 60245849003**      Collected: 06/06/17 09:47      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<b>259</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 16:38	7440-39-3	
Beryllium	<b>0.35J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 16:38	7440-41-7	B
Boron	<b>70.8J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 16:38	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 16:38	7440-70-2	
Cobalt	<b>1.3J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 16:38	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 16:38	7439-92-1	
Lithium	<b>29.6</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 16:38	7439-93-2	B
Molybdenum	<b>3.4J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 16:38	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.10J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:09	7440-36-0	
Arsenic	<b>2.0</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:09	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:09	7440-43-9	
Chromium	<b>0.15J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:09	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:09	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:09	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 14:43	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>466</b>	mg/L	5.0	5.0	1		06/08/17 08:07		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.2</b>	Std. Units	0.10	0.10	1		06/09/17 09:50		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.7</b>	mg/L	1.0	0.50	1		06/09/17 14:03	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.10	1		06/09/17 14:03	16984-48-8	
Sulfate	<b>52.9</b>	mg/L	5.0	2.5	5		06/09/17 14:19	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UG-3**      **Lab ID: 60245849006**      Collected: 06/06/17 12:05      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b> Analytical Method: EPA 200.7      Preparation Method: EPA 200.7									
Barium	<b>249</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 16:45	7440-39-3	
Beryllium	<b>0.52J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 16:45	7440-41-7	B
Boron	<b>696</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 16:45	7440-42-8	
Calcium	<b>128000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 16:45	7440-70-2	
Cobalt	<b>2.2J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 16:45	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 16:45	7439-92-1	
Lithium	<b>33.0</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 16:45	7439-93-2	B
Molybdenum	<b>2.6J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 16:45	7439-98-7	
<b>200.8 MET ICPMS</b> Analytical Method: EPA 200.8      Preparation Method: EPA 200.8									
Antimony	<b>0.17J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:22	7440-36-0	
Arsenic	<b>0.44J</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:22	7440-38-2	
Cadmium	<b>0.26J</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:22	7440-43-9	
Chromium	<b>0.24J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:22	7440-47-3	
Selenium	<b>1.5</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:22	7782-49-2	
Thallium	<b>0.057J</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:22	7440-28-0	
<b>7470 Mercury</b> Analytical Method: EPA 7470      Preparation Method: EPA 7470									
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 14:54	7439-97-6	
<b>2540C Total Dissolved Solids</b> Analytical Method: SM 2540C									
Total Dissolved Solids	<b>585</b>	mg/L	5.0	5.0	1		06/09/17 07:38		
<b>4500H+ pH, Electrometric</b> Analytical Method: SM 4500-H+B									
pH at 25 Degrees C	<b>7.3</b>	Std. Units	0.10	0.10	1		06/09/17 10:14		H6
<b>300.0 IC Anions 28 Days</b> Analytical Method: EPA 300.0									
Chloride	<b>52.3</b>	mg/L	5.0	2.5	5		06/09/17 15:36	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.10	1		06/09/17 16:22	16984-48-8	
Sulfate	<b>123</b>	mg/L	10.0	5.0	10		06/12/17 12:40	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UWL-DUP-1**      **Lab ID: 60245849011**      Collected: 06/06/17 08:00      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>269</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 17:07	7440-39-3	
Beryllium	<b>0.39J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 17:07	7440-41-7	B
Boron	<b>58.4J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 17:07	7440-42-8	
Calcium	<b>126000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 17:07	7440-70-2	
Cobalt	<b>0.77J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 17:07	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 17:07	7439-92-1	
Lithium	<b>36.9</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 17:07	7439-93-2	
Molybdenum	<b>1.5J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 17:07	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.15J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:55	7440-36-0	
Arsenic	<b>0.50J</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:55	7440-38-2	
Cadmium	<b>0.079J</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:55	7440-43-9	
Chromium	<b>0.25J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:55	7440-47-3	
Selenium	<b>2.9</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:55	7782-49-2	
Thallium	<b>0.053J</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:55	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 15:09	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>668</b>	mg/L	5.0	5.0	1		06/09/17 07:40		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		06/07/17 16:31		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>99.6</b>	mg/L	10.0	5.0	10		06/12/17 13:12	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.10	1		06/09/17 20:13	16984-48-8	
Sulfate	<b>23.1</b>	mg/L	2.0	1.0	2		06/09/17 20:29	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UWL-FB-1**      **Lab ID: 60245849012**      Collected: 06/06/17 09:20      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<0.91	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 17:09	7440-39-3	
Beryllium	0.50J	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 17:09	7440-41-7	B
Boron	<3.5	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 17:09	7440-42-8	
Calcium	54.2J	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 17:09	7440-70-2	B
Cobalt	<0.73	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 17:09	7440-48-4	
Lead	<2.4	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 17:09	7439-92-1	
Lithium	<2.9	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 17:09	7439-93-2	
Molybdenum	<1.3	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 17:09	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<0.026	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:35	7440-36-0	
Arsenic	<0.052	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:35	7440-38-2	
Cadmium	<0.018	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:35	7440-43-9	
Chromium	0.21J	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:35	7440-47-3	
Selenium	<0.086	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:35	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:35	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<0.046	ug/L	0.20	0.046	1	06/16/17 09:58	06/16/17 15:11	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		06/09/17 07:40		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	5.8	Std. Units	0.10	0.10	1		06/09/17 10:11		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		06/09/17 20:44	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		06/09/17 20:44	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		06/09/17 20:44	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-BMW-3S**      **Lab ID: 60245853001**      Collected: 06/05/17 14:07      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>180</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 17:21	7440-39-3	
Beryllium	<b>0.28J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 17:21	7440-41-7	B
Boron	<b>55.3J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 17:21	7440-42-8	
Calcium	<b>113000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 17:21	7440-70-2	
Cobalt	<b>2.0J</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 17:21	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 17:21	7439-92-1	
Lithium	<b>8.7J</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 17:21	7439-93-2	B
Molybdenum	<b>2.4J</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 17:21	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.039J</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 23:05	7440-36-0	
Arsenic	<b>0.64J</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 23:05	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 23:05	7440-43-9	
Chromium	<b>0.12J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 23:05	7440-47-3	
Selenium	<b>0.095J</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 23:05	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 23:05	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/22/17 16:50	06/23/17 09:19	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>426</b>	mg/L	5.0	5.0	1		06/08/17 08:02		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.0</b>	Std. Units	0.10	0.10	1		06/07/17 16:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.5</b>	mg/L	1.0	0.50	1		06/09/17 21:30	16887-00-6	
Fluoride	<b>0.33</b>	mg/L	0.20	0.10	1		06/09/17 21:30	16984-48-8	
Sulfate	<b>25.0</b>	mg/L	2.0	1.0	2		06/09/17 21:46	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-BMW-1S**      **Lab ID: 60245853002**      Collected: 06/05/17 15:10      Received: 06/07/17 04:25      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7      Preparation Method: EPA 200.7							
Barium	<b>146</b>	ug/L	5.0	0.91	1	06/16/17 10:25	06/16/17 16:51	7440-39-3	
Beryllium	<b>0.42J</b>	ug/L	1.0	0.16	1	06/16/17 10:25	06/16/17 16:51	7440-41-7	B
Boron	<b>65.3J</b>	ug/L	100	3.5	1	06/16/17 10:25	06/16/17 16:51	7440-42-8	
Calcium	<b>140000</b>	ug/L	100	36.0	1	06/16/17 10:25	06/16/17 16:51	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 10:25	06/16/17 16:51	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 10:25	06/16/17 16:51	7439-92-1	
Lithium	<b>&lt;2.9</b>	ug/L	10.0	2.9	1	06/16/17 10:25	06/16/17 16:51	7439-93-2	
Molybdenum	<b>2.5J</b>	ug/L	20.0	1.3	1	06/16/17 10:25	06/16/17 16:51	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.093J</b>	ug/L	1.0	0.026	1	06/16/17 10:25	06/20/17 13:12	7440-36-0	
Arsenic	<b>0.73J</b>	ug/L	1.0	0.052	1	06/16/17 10:25	06/20/17 13:12	7440-38-2	
Cadmium	<b>0.10J</b>	ug/L	0.50	0.018	1	06/16/17 10:25	06/20/17 13:12	7440-43-9	
Chromium	<b>0.18J</b>	ug/L	1.0	0.054	1	06/16/17 10:25	06/20/17 13:12	7440-47-3	
Selenium	<b>0.18J</b>	ug/L	1.0	0.086	1	06/16/17 10:25	06/20/17 13:12	7782-49-2	
Thallium	<b>0.11J</b>	ug/L	1.0	0.036	1	06/16/17 10:25	06/20/17 13:12	7440-28-0	B
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	06/22/17 16:50	06/23/17 09:21	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>409</b>	mg/L	5.0	5.0	1		06/08/17 08:02		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.8</b>	Std. Units	0.10	0.10	1		06/07/17 16:22		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>16.8</b>	mg/L	1.0	0.50	1		06/09/17 22:32	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.10	1		06/09/17 22:32	16984-48-8	
Sulfate	<b>23.1</b>	mg/L	2.0	1.0	2		06/09/17 22:47	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 481141 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

METHOD BLANK: 1970874 Matrix: Water  
 Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	06/16/17 14:27	

LABORATORY CONTROL SAMPLE: 1970875

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1970876 1970877

Parameter	Units	60245849009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.046	5	5	4.6	4.7	91	93	75-125	2	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 482248 Analysis Method: EPA 7470  
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
Associated Lab Samples: 60245853001, 60245853002

METHOD BLANK: 1975364 Matrix: Water  
Associated Lab Samples: 60245853001, 60245853002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	06/23/17 09:08	

LABORATORY CONTROL SAMPLE: 1975365

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1975366 1975367

Parameter	Units	60245851003		60245851003		60245851003		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS % Rec	MSD % Rec					
Mercury	ug/L	<0.046	<0.046	5	5	4.8	4.4	95	87	75-125	9	20

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1975368 1975369

Parameter	Units	60246227005		60246227005		60246227005		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS % Rec	MSD % Rec					
Mercury	ug/L	0.054J	0.054J	5	5	4.6	4.3	90	85	75-125	6	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 481055 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001

METHOD BLANK: 1970475 Matrix: Water  
 Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	06/19/17 16:31	
Beryllium	ug/L	0.49J	1.0	0.16	06/19/17 16:31	
Boron	ug/L	<3.5	100	3.5	06/19/17 16:31	
Calcium	ug/L	36.1J	100	36.0	06/19/17 16:31	
Cobalt	ug/L	<0.73	5.0	0.73	06/19/17 16:31	
Lead	ug/L	<2.4	5.0	2.4	06/19/17 16:31	
Lithium	ug/L	3.3J	10.0	2.9	06/19/17 16:31	
Molybdenum	ug/L	<1.3	20.0	1.3	06/19/17 16:31	

LABORATORY CONTROL SAMPLE: 1970476

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1020	102	85-115	
Beryllium	ug/L	1000	1010	101	85-115	
Boron	ug/L	1000	901	90	85-115	
Calcium	ug/L	10000	9440	94	85-115	
Cobalt	ug/L	1000	1050	105	85-115	
Lead	ug/L	1000	1070	107	85-115	
Lithium	ug/L	1000	999	100	85-115	
Molybdenum	ug/L	1000	1070	107	85-115	

MATRIX SPIKE SAMPLE: 1970477

Parameter	Units	60245849006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	249	1000	1280	103	70-130	
Beryllium	ug/L	0.52J	1000	1020	102	70-130	
Boron	ug/L	696	1000	1640	94	70-130	
Calcium	ug/L	128000	10000	137000	99	70-130	
Cobalt	ug/L	2.2J	1000	1030	102	70-130	
Lead	ug/L	<2.4	1000	1050	105	70-130	
Lithium	ug/L	33.0	1000	1080	104	70-130	
Molybdenum	ug/L	2.6J	1000	1090	109	70-130	

MATRIX SPIKE SAMPLE: 1970478

Parameter	Units	60245849009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	291	1000	1320	103	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

MATRIX SPIKE SAMPLE:		1970478					
Parameter	Units	60245849009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Beryllium	ug/L	0.28J	1000	1020	102	70-130	
Boron	ug/L	80.0J	1000	1010	93	70-130	
Calcium	ug/L	128000	10000	137000	96	70-130	
Cobalt	ug/L	1.6J	1000	1020	102	70-130	
Lead	ug/L	<2.4	1000	1040	104	70-130	
Lithium	ug/L	34.8	1000	1080	105	70-130	
Molybdenum	ug/L	1.6J	1000	1080	108	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL  
Pace Project No.: 60261465

QC Batch: 481289 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60245853002

METHOD BLANK: 1971503 Matrix: Water  
Associated Lab Samples: 60245853002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	06/16/17 16:42	
Beryllium	ug/L	0.38J	1.0	0.16	06/16/17 16:42	
Boron	ug/L	<3.5	100	3.5	06/16/17 16:42	
Calcium	ug/L	<36.0	100	36.0	06/16/17 16:42	
Cobalt	ug/L	<0.73	5.0	0.73	06/16/17 16:42	
Lead	ug/L	<2.4	5.0	2.4	06/16/17 16:42	
Lithium	ug/L	<2.9	10.0	2.9	06/16/17 16:42	
Molybdenum	ug/L	<1.3	20.0	1.3	06/16/17 16:42	

LABORATORY CONTROL SAMPLE: 1971504

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1060	106	85-115	
Beryllium	ug/L	1000	1060	106	85-115	
Boron	ug/L	1000	942	94	85-115	
Calcium	ug/L	10000	9650	97	85-115	
Cobalt	ug/L	1000	1070	107	85-115	
Lead	ug/L	1000	1080	108	85-115	
Lithium	ug/L	1000	1060	106	85-115	
Molybdenum	ug/L	1000	1080	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1971505 1971506

Parameter	Units	60245851003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	Result	MSD Result	% Rec	MSD % Rec					
Barium	ug/L	112	1000	1000	1180	1170	106	106	70-130	1	20		
Beryllium	ug/L	0.26J	1000	1000	1070	1060	107	106	70-130	1	20		
Boron	ug/L	781	1000	1000	1760	1730	98	95	70-130	2	20		
Calcium	ug/L	69600	10000	10000	80200	78000	107	84	70-130	3	20		
Cobalt	ug/L	<0.73	1000	1000	1060	1050	106	105	70-130	0	20		
Lead	ug/L	<2.4	1000	1000	1070	1060	107	106	70-130	1	20		
Lithium	ug/L	13.2	1000	1000	1090	1090	108	107	70-130	1	20		
Molybdenum	ug/L	115	1000	1000	1210	1200	110	109	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

MATRIX SPIKE SAMPLE:		1971507					
Parameter	Units	60246016006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	111	1000	1190	108	70-130	
Beryllium	ug/L	0.28J	1000	1070	107	70-130	
Boron	ug/L	6500	1000	7600	110	70-130	
Calcium	ug/L	160000	10000	172000	114	70-130	
Cobalt	ug/L	6.1	1000	1060	105	70-130	
Lead	ug/L	<2.4	1000	1060	106	70-130	
Lithium	ug/L	17.2	1000	1140	112	70-130	
Molybdenum	ug/L	346	1000	1460	111	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch:	481057	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001		

METHOD BLANK: 1970480 Matrix: Water  
Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	06/16/17 21:56	
Arsenic	ug/L	<0.052	1.0	0.052	06/16/17 21:56	
Cadmium	ug/L	<0.018	0.50	0.018	06/16/17 21:56	
Chromium	ug/L	<0.054	1.0	0.054	06/16/17 21:56	
Selenium	ug/L	<0.086	1.0	0.086	06/16/17 21:56	
Thallium	ug/L	<0.036	1.0	0.036	06/16/17 21:56	

LABORATORY CONTROL SAMPLE: 1970481

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.2	101	85-115	
Arsenic	ug/L	40	39.9	100	85-115	
Cadmium	ug/L	40	39.7	99	85-115	
Chromium	ug/L	40	40.4	101	85-115	
Selenium	ug/L	40	39.6	99	85-115	
Thallium	ug/L	40	38.0	95	85-115	

MATRIX SPIKE SAMPLE: 1970482

Parameter	Units	60245849004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.12J	40	40.5	101	70-130	
Arsenic	ug/L	0.48J	40	40.3	100	70-130	
Cadmium	ug/L	0.18J	40	38.8	97	70-130	
Chromium	ug/L	0.26J	40	39.8	99	70-130	
Selenium	ug/L	0.87J	40	37.9	93	70-130	
Thallium	ug/L	0.041J	40	39.7	99	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1970483 1970484

Parameter	Units	60245849009 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.090J	40	40	40.5	40.1	101	100	70-130	1	20	
Arsenic	ug/L	0.52J	40	40	40.8	39.8	101	98	70-130	2	20	
Cadmium	ug/L	0.043J	40	40	39.2	38.6	98	96	70-130	2	20	
Chromium	ug/L	0.16J	40	40	40.0	39.2	100	98	70-130	2	20	
Selenium	ug/L	1.1	40	40	38.8	38.0	94	92	70-130	2	20	
Thallium	ug/L	<0.036	40	40	39.6	39.2	99	98	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 481290 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60245853002

METHOD BLANK: 1971508 Matrix: Water

Associated Lab Samples: 60245853002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	06/20/17 12:56	
Arsenic	ug/L	<0.052	1.0	0.052	06/20/17 12:56	
Cadmium	ug/L	<0.018	0.50	0.018	06/20/17 12:56	
Chromium	ug/L	<0.054	1.0	0.054	06/20/17 12:56	
Selenium	ug/L	<0.086	1.0	0.086	06/20/17 12:56	
Thallium	ug/L	0.043J	1.0	0.036	06/20/17 12:56	

LABORATORY CONTROL SAMPLE: 1971509

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.2	98	85-115	
Arsenic	ug/L	40	38.7	97	85-115	
Cadmium	ug/L	40	39.0	97	85-115	
Chromium	ug/L	40	39.5	99	85-115	
Selenium	ug/L	40	39.3	98	85-115	
Thallium	ug/L	40	37.0	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1971510 1971511

Parameter	Units	60245851003		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Antimony	ug/L	<0.026	40	40	39.0	38.9	97	97	70-130	0	20	
Arsenic	ug/L	0.14J	40	40	38.9	39.1	97	97	70-130	1	20	
Cadmium	ug/L	0.030J	40	40	38.0	38.4	95	96	70-130	1	20	
Chromium	ug/L	0.10J	40	40	39.4	39.5	98	99	70-130	0	20	
Selenium	ug/L	<0.086	40	40	36.8	37.2	92	93	70-130	1	20	
Thallium	ug/L	0.11J	40	40	39.1	39.0	97	97	70-130	0	20	

MATRIX SPIKE SAMPLE: 1971512

Parameter	Units	60246016002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.18J	40	38.9	97	70-130	
Arsenic	ug/L	0.62J	40	38.6	95	70-130	
Cadmium	ug/L	0.35J	40	37.0	92	70-130	
Chromium	ug/L	0.11J	40	39.0	97	70-130	
Selenium	ug/L	0.12J	40	35.2	88	70-130	
Thallium	ug/L	0.041J	40	40.2	100	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 480117

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245853001, 60245853002

METHOD BLANK: 1966536

Matrix: Water

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245853001, 60245853002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/08/17 07:57	

LABORATORY CONTROL SAMPLE: 1966537

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	967	97	80-120	

SAMPLE DUPLICATE: 1966538

Parameter	Units	60245753007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	470	460	2	10	

SAMPLE DUPLICATE: 1966539

Parameter	Units	60245829001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6080	6110	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 480253

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60245849006, 60245849011, 60245849012

METHOD BLANK: 1967043

Matrix: Water

Associated Lab Samples: 60245849006, 60245849011, 60245849012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/09/17 07:34	

LABORATORY CONTROL SAMPLE: 1967044

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	955	96	80-120	

SAMPLE DUPLICATE: 1967045

Parameter	Units	60245849009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	532	521	2	10	

SAMPLE DUPLICATE: 1967046

Parameter	Units	60245851003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	353	323	9	10	

SAMPLE DUPLICATE: 1967047

Parameter	Units	60245890001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1050	1020	2	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 480064 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60245849011, 60245853001, 60245853002

SAMPLE DUPLICATE: 1966201

Parameter	Units	60245680003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.1	1	5	H6

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 480363 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849012

SAMPLE DUPLICATE: 1967625

Parameter	Units	60245849009 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.1	7.1	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch:	480432	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001, 60245853002		

METHOD BLANK:	1967966	Matrix:	Water
Associated Lab Samples:	60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012, 60245853001, 60245853002		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/09/17 08:44	
Fluoride	mg/L	<0.10	0.20	0.10	06/09/17 08:44	
Sulfate	mg/L	<0.50	1.0	0.50	06/09/17 08:44	

LABORATORY CONTROL SAMPLE: 1967967

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	90-110	
Fluoride	mg/L	2.5	2.7	108	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1967968 1967969

Parameter	Units	60245849009		60245851003		MSD		% Rec		Max	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS % Rec	MSD % Rec	Limits	RPD	RPD	Qual
Chloride	mg/L	10.9	5	5	16.6	16.6	114	114	80-120	0	15
Fluoride	mg/L	0.34	2.5	2.5	2.9	2.9	103	104	80-120	1	15
Sulfate	mg/L	50.8	25	25	76.3	76.5	102	103	80-120	0	15

MATRIX SPIKE SAMPLE: 1967970

Parameter	Units	60245851003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	19.5	10	31.0	115	80-120	

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**REPORT OF LABORATORY ANALYSIS**

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 480584 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60245849006, 60245849011

METHOD BLANK: 1968899 Matrix: Water

Associated Lab Samples: 60245849006, 60245849011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/12/17 08:53	
Sulfate	mg/L	<0.50	1.0	0.50	06/12/17 08:53	

LABORATORY CONTROL SAMPLE: 1968900

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1968901 1968902

Parameter	Units	60245973001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result							
Sulfate	mg/L	12.4	5	5	17.8	17.9	107	109	80-120	0	15	

MATRIX SPIKE SAMPLE: 1968952

Parameter	Units	60246129001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	691	1000	1710	102	80-120	
Sulfate	mg/L	1800	1000	2840	104	80-120	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

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**Sample: S-TMW-1**      **Lab ID: 60245849001**      Collected: 06/06/17 11:20      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.314 ± 0.328 (0.462)</b> C:NA T:86%	pCi/L	06/20/17 21:34	13982-63-3	
Radium-228	EPA 904.0	<b>0.292 ± 0.352 (0.742)</b> C:76% T:94%	pCi/L	06/23/17 18:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-TMW-2**      **Lab ID: 60245849002**      Collected: 06/06/17 10:45      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.275 ± 0.325 (0.510)</b> <b>C:NA T:92%</b>	pCi/L	06/20/17 21:51	13982-63-3	
Radium-228	EPA 904.0	<b>0.493 ± 0.382 (0.749)</b> <b>C:78% T:91%</b>	pCi/L	06/23/17 18:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-TMW-3**      **Lab ID: 60245849003**      Collected: 06/06/17 09:47      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.454 ± 0.419 (0.610)</b> <b>C:NA T:89%</b>	pCi/L	06/20/17 21:51	13982-63-3	
Radium-228	EPA 904.0	<b>0.666 ± 0.435 (0.819)</b> <b>C:78% T:85%</b>	pCi/L	06/23/17 18:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UG-3**      **Lab ID: 60245849006**      Collected: 06/06/17 12:05      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.198 ± 0.343 (0.613)</b> C:NA T:89%	pCi/L	06/20/17 21:51	13982-63-3	
Radium-228	EPA 904.0	<b>0.971 ± 0.482 (0.827)</b> C:77% T:89%	pCi/L	06/23/17 18:01	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UWL-DUP-1**      **Lab ID: 60245849011**      Collected: 06/06/17 08:00      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.118 ± 0.434 (0.833)</b> <b>C:NA T:88%</b>	pCi/L	06/20/17 22:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.182 ± 0.272 (0.587)</b> <b>C:73% T:95%</b>	pCi/L	06/23/17 15:59	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-UWL-FB-1**      **Lab ID: 60245849012**      Collected: 06/06/17 09:20      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.255 ± 0.302 (0.474)</b> <b>C:NA T:100%</b>	pCi/L	06/20/17 22:06	13982-63-3	
Radium-228	EPA 904.0	<b>0.436 ± 0.321 (0.622)</b> <b>C:80% T:87%</b>	pCi/L	06/23/17 15:59	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.434 ± 0.371 (0.503)</b> C:NA T:99%	pCi/L	06/20/17 20:21	13982-63-3	
Radium-228	EPA 904.0	<b>0.987 ± 0.368 (0.496)</b> C:75% T:90%	pCi/L	06/23/17 11:51	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

**Sample: S-BMW-1S**      **Lab ID: 60245853002**      Collected: 06/05/17 15:10      Received: 06/07/17 04:25      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.363 ± 0.421 (0.679)</b> <b>C:NA T:102%</b>	pCi/L	06/20/17 20:21	13982-63-3	
Radium-228	EPA 904.0	<b>0.471 ± 0.317 (0.597)</b> <b>C:78% T:87%</b>	pCi/L	06/23/17 11:51	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 261523 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60245853001, 60245853002

METHOD BLANK: 1287930 Matrix: Water

Associated Lab Samples: 60245853001, 60245853002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.255 ± 0.234 (0.138) C:NA T:102%	pCi/L	06/20/17 20:21	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 261524 Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

METHOD BLANK: 1287931 Matrix: Water

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.163 ± 0.320 (0.585) C:NA T:92%	pCi/L	06/20/17 21:15	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 261760 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

METHOD BLANK: 1288839 Matrix: Water

Associated Lab Samples: 60245849001, 60245849002, 60245849003, 60245849006, 60245849011, 60245849012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.391 ± 0.314 (0.617) C:78% T:81%	pCi/L	06/23/17 11:21	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

QC Batch: 261754 Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60245853001, 60245853002

METHOD BLANK: 1288829 Matrix: Water

Associated Lab Samples: 60245853001, 60245853002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.690 ± 0.358 (0.620) C:77% T:86%	pCi/L	06/23/17 11:51	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60245849001	S-TMW-1	EPA 200.7	481055	EPA 200.7	481081
60245849002	S-TMW-2	EPA 200.7	481055	EPA 200.7	481081
60245849003	S-TMW-3	EPA 200.7	481055	EPA 200.7	481081
60245849006	S-UG-3	EPA 200.7	481055	EPA 200.7	481081
60245849011	S-UWL-DUP-1	EPA 200.7	481055	EPA 200.7	481081
60245849012	S-UWL-FB-1	EPA 200.7	481055	EPA 200.7	481081
60245853001	S-BMW-3S	EPA 200.7	481055	EPA 200.7	481081
60245853002	S-BMW-1S	EPA 200.7	481289	EPA 200.7	481371
60245849001	S-TMW-1	EPA 200.8	481057	EPA 200.8	481080
60245849002	S-TMW-2	EPA 200.8	481057	EPA 200.8	481080
60245849003	S-TMW-3	EPA 200.8	481057	EPA 200.8	481080
60245849006	S-UG-3	EPA 200.8	481057	EPA 200.8	481080
60245849011	S-UWL-DUP-1	EPA 200.8	481057	EPA 200.8	481080
60245849012	S-UWL-FB-1	EPA 200.8	481057	EPA 200.8	481080
60245853001	S-BMW-3S	EPA 200.8	481057	EPA 200.8	481080
60245853002	S-BMW-1S	EPA 200.8	481290	EPA 200.8	481370
60245849001	S-TMW-1	EPA 7470	481141	EPA 7470	481323
60245849002	S-TMW-2	EPA 7470	481141	EPA 7470	481323
60245849003	S-TMW-3	EPA 7470	481141	EPA 7470	481323
60245849006	S-UG-3	EPA 7470	481141	EPA 7470	481323
60245849011	S-UWL-DUP-1	EPA 7470	481141	EPA 7470	481323
60245849012	S-UWL-FB-1	EPA 7470	481141	EPA 7470	481323
60245853001	S-BMW-3S	EPA 7470	482248	EPA 7470	482262
60245853002	S-BMW-1S	EPA 7470	482248	EPA 7470	482262
60245849001	S-TMW-1	EPA 903.1	261524		
60245849002	S-TMW-2	EPA 903.1	261524		
60245849003	S-TMW-3	EPA 903.1	261524		
60245849006	S-UG-3	EPA 903.1	261524		
60245849011	S-UWL-DUP-1	EPA 903.1	261524		
60245849012	S-UWL-FB-1	EPA 903.1	261524		
60245853001	S-BMW-3S	EPA 903.1	261523		
60245853002	S-BMW-1S	EPA 903.1	261523		
60245849001	S-TMW-1	EPA 904.0	261760		
60245849002	S-TMW-2	EPA 904.0	261760		
60245849003	S-TMW-3	EPA 904.0	261760		
60245849006	S-UG-3	EPA 904.0	261760		
60245849011	S-UWL-DUP-1	EPA 904.0	261760		
60245849012	S-UWL-FB-1	EPA 904.0	261760		
60245853001	S-BMW-3S	EPA 904.0	261754		
60245853002	S-BMW-1S	EPA 904.0	261754		
60245849001	S-TMW-1	SM 2540C	480117		
60245849002	S-TMW-2	SM 2540C	480117		
60245849003	S-TMW-3	SM 2540C	480117		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CENTER-UWL

Pace Project No.: 60261465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60245849006	S-UG-3	SM 2540C	480253		
60245849011	S-UWL-DUP-1	SM 2540C	480253		
60245849012	S-UWL-FB-1	SM 2540C	480253		
60245853001	S-BMW-3S	SM 2540C	480117		
60245853002	S-BMW-1S	SM 2540C	480117		
60245849001	S-TMW-1	SM 4500-H+B	480363		
60245849002	S-TMW-2	SM 4500-H+B	480363		
60245849003	S-TMW-3	SM 4500-H+B	480363		
60245849006	S-UG-3	SM 4500-H+B	480363		
60245849011	S-UWL-DUP-1	SM 4500-H+B	480064		
60245849012	S-UWL-FB-1	SM 4500-H+B	480363		
60245853001	S-BMW-3S	SM 4500-H+B	480064		
60245853002	S-BMW-1S	SM 4500-H+B	480064		
60245849001	S-TMW-1	EPA 300.0	480432		
60245849002	S-TMW-2	EPA 300.0	480432		
60245849003	S-TMW-3	EPA 300.0	480432		
60245849006	S-UG-3	EPA 300.0	480432		
60245849006	S-UG-3	EPA 300.0	480584		
60245849011	S-UWL-DUP-1	EPA 300.0	480432		
60245849011	S-UWL-DUP-1	EPA 300.0	480584		
60245849012	S-UWL-FB-1	EPA 300.0	480432		
60245853001	S-BMW-3S	EPA 300.0	480432		
60245853002	S-BMW-1S	EPA 300.0	480432		

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Sample Condition Upon Receipt

WO#: 60245849
Barcode: 60245849

Client Name: Golder

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

Tracking #: Pace Shipping Label Used? Yes [ ] No [ ]

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

Packing Material: Bubble Wrap [ ] Bubble Bags [ ] Foam [ ] None [ ] Other [ ]

Thermometer Used: T-266 T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 17.0/15.0 Corr. Factor CF +2.9 CF +0.2 Corrected 17.2/15.2/1.0
Temperature should be above freezing to 6°C D.B. pvd 7/17

Date and initials of person examining contents: pvd/7/17

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., DH, WT).

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

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Jami Chok Date: 6/7/17



WO#: 60245853



60245853



Sample Condition Upon Receipt

Client Name: Golden

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.8/14.6 Corr. Factor CF +2.9 CF +0.2 Corrected 1.0/14.8

Date and initials of person examining contents:

PV 6/7/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>PH</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Chack \_\_\_\_\_ Date: 6/7/17



# CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A**  
 Required Client Information:  
 Company: Golder Associates  
 Address: 820 South Main Street, Suite 100  
 St Charles, MO 63301  
 Email To: maddock@golder.com  
 Phone: 636-724-9191 Fax: 636-724-9323  
 Requested Due Date/TAT: Standard

**Section B**  
 Required Project Information:  
 Report To: Mark Haddock (mhaddock@golder.com)  
 Copy To: Jeffrey Ingram  
 Purchase Order No.:  
 Project Name: Ameren Sioux Energy Center - Fly Ash  
 Project Number: 153-1406.0003B

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: Jamie Church  
 Pace Profile #: 9285

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER  
 Site Location: MO  
 STATE: MO

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOILSOLID SL OIL OL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Preservatives Unpreserved H <sub>2</sub> SO <sub>4</sub> HNO <sub>3</sub> HCl NaOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Methanol Other	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		COMPOSITE START	COMPOSITE END/GRAB							
1	S-BMW-3S			G	WT	4				60245883
2	S-BMW-1S			G	WT	1				1635N2-18PM 28PINCH
3	S-LMW-4S			G	WT	1				052
4	S-LMW-3S			G	WT	1				03
5	S-LMW-DUP-1			G	WT	1				04
6				G	WT	1				05
7				G	WT					
8				G	WT					
9				G	WT					
10				G	WT					
11				G	WT					
12				G	WT					

**ADDITIONAL COMMENTS**  
 Relinquished by / Affiliation: Golder Associates  
 Date: 6/6/17 Time: 16:35  
 Relinquished by / Affiliation: Golder Associates  
 Date: 6/6/17 Time: 17:00

**ACCEPTED BY / AFFILIATION**  
 Date: 6/7/17 Time: 04:25  
 Date: 06/09/17

**SAMPLE CONDITIONS**  
 Received on Ice (Y/N): X  
 Custody Sealed (Y/N): X  
 Temp in °C: 15.2  
 Samples Intact (Y/N): X

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: Johnson  
 SIGNATURE of SAMPLER: [Signature]

July 18, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60247466

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on June 28, 2017. 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,



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

Enclosures

cc: Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

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### Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601

L-A-B DOD-ELAP Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification

Connecticut Certification #: PH-0694

Delaware Certification

Florida/TNI Certification #: E87683

Georgia Certification #: C040

Guam Certification

Hawaii Certification

Idaho Certification

Illinois Certification

Indiana Certification

Iowa Certification #: 391

Kansas/TNI Certification #: E-10358

Kentucky Certification #: 90133

Louisiana DHH/TNI Certification #: LA140008

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: PA00091

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification

Missouri Certification #: 235

Montana Certification #: Cert 0082

Nebraska Certification #: NE-05-29-14

Nevada Certification #: PA014572015-1

New Hampshire/TNI Certification #: 2976

New Jersey/TNI Certification #: PA 051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Oregon/TNI Certification #: PA200002

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: TN2867

Texas/TNI Certification #: T104704188-14-8

Utah/TNI Certification #: PA014572015-5

USDA Soil Permit #: P330-14-00213

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 460198

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Certification

Wyoming Certification #: 8TMS-L

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### Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247466001	S-BMW-3S	Water	06/26/17 16:34	06/28/17 03:30

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247466001	S-BMW-3S	EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

**Sample: S-BMW-3S**      **Lab ID: 60247466001**      Collected: 06/26/17 16:34      Received: 06/28/17 03:30      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Barium	<b>152</b>	ug/L	5.0	0.91	1	06/28/17 16:50	06/30/17 19:34	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/28/17 16:50	06/30/17 19:34	7440-41-7	
Boron	<b>64.6J</b>	ug/L	100	3.5	1	06/28/17 16:50	06/30/17 19:34	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	36.0	1	06/28/17 16:50	06/30/17 19:34	7440-70-2	
Cobalt	<b>1.2J</b>	ug/L	5.0	0.73	1	06/28/17 16:50	06/30/17 19:34	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/28/17 16:50	06/30/17 19:34	7439-92-1	
Lithium	<b>9.5J</b>	ug/L	10.0	2.9	1	06/28/17 16:50	06/30/17 19:34	7439-93-2	
Molybdenum	<b>3.1J</b>	ug/L	20.0	1.3	1	06/28/17 16:50	06/30/17 19:34	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.055J</b>	ug/L	1.0	0.026	1	06/28/17 16:50	06/30/17 13:57	7440-36-0	
Arsenic	<b>0.41J</b>	ug/L	1.0	0.052	1	06/28/17 16:50	06/30/17 13:57	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/28/17 16:50	06/30/17 13:57	7440-43-9	
Chromium	<b>0.14J</b>	ug/L	1.0	0.054	1	06/28/17 16:50	06/30/17 13:57	7440-47-3	B
Selenium	<b>0.22J</b>	ug/L	1.0	0.086	1	06/28/17 16:50	06/30/17 13:57	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/28/17 16:50	06/30/17 13:57	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>&lt;0.046</b>	ug/L	0.20	0.046	1	07/11/17 11:16	07/12/17 09:05	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>436</b>	mg/L	5.0	5.0	1		06/29/17 16:24		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.1</b>	Std. Units	0.10	0.10	1		06/28/17 13:19		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.2</b>	mg/L	1.0	0.50	1		07/08/17 00:59	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.10	1		07/08/17 00:59	16984-48-8	
Sulfate	<b>23.8</b>	mg/L	2.0	1.0	2		07/08/17 11:22	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 484651 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60247466001

METHOD BLANK: 1985098 Matrix: Water  
 Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	07/12/17 08:59	

LABORATORY CONTROL SAMPLE: 1985099

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.4	88	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1985100 1985101

Parameter	Units	60247847002 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits		
Mercury	ug/L	ND	5	5	4.7	4.4	94	89	75-125	5	20

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 483134

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60247466001

METHOD BLANK: 1979063

Matrix: Water

Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	07/02/17 12:18	
Beryllium	ug/L	0.31J	1.0	0.16	07/02/17 12:18	
Boron	ug/L	<3.5	100	3.5	06/30/17 19:20	
Calcium	ug/L	<36.0	100	36.0	07/02/17 12:18	
Cobalt	ug/L	<0.73	5.0	0.73	06/30/17 19:20	
Lead	ug/L	<2.4	5.0	2.4	06/30/17 19:20	
Lithium	ug/L	<2.9	10.0	2.9	07/02/17 12:18	
Molybdenum	ug/L	<1.3	20.0	1.3	06/30/17 19:20	

LABORATORY CONTROL SAMPLE: 1979064

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	85-115	
Beryllium	ug/L	1000	993	99	85-115	
Boron	ug/L	1000	953	95	85-115	
Calcium	ug/L	10000	9710	97	85-115	
Cobalt	ug/L	1000	1040	104	85-115	
Lead	ug/L	1000	1050	105	85-115	
Lithium	ug/L	1000	1080	108	85-115	
Molybdenum	ug/L	1000	1050	105	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979065 1979066

Parameter	Units	60247402001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Barium	ug/L	0.038 mg/L	1000	1000	1060	1050	103	101	70-130	2	20		
Beryllium	ug/L	ND	1000	1000	961	945	96	94	70-130	2	20		
Boron	ug/L	0.14 mg/L	1000	1000	1130	1120	99	98	70-130	1	20		
Calcium	ug/L	30.1 mg/L	10000	10000	39000	38200	89	82	70-130	2	20		
Cobalt	ug/L	ND	1000	1000	966	957	97	96	70-130	1	20		
Lead	ug/L	ND	1000	1000	929	920	93	92	70-130	1	20		
Lithium	ug/L	0.047 mg/L	1000	1000	1130	1110	109	107	70-130	2	20		
Molybdenum	ug/L	ND	1000	1000	1010	1000	101	100	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60247466

QC Batch: 483133 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60247466001

METHOD BLANK: 1979050 Matrix: Water  
Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	06/30/17 12:52	
Arsenic	ug/L	<0.052	1.0	0.052	06/30/17 12:52	
Cadmium	ug/L	<0.018	0.50	0.018	06/30/17 12:52	
Chromium	ug/L	0.087J	1.0	0.054	06/30/17 12:52	
Selenium	ug/L	<0.086	1.0	0.086	06/30/17 12:52	
Thallium	ug/L	<0.036	1.0	0.036	06/30/17 12:52	

LABORATORY CONTROL SAMPLE: 1979051

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.5	96	85-115	
Arsenic	ug/L	40	40.9	102	85-115	
Cadmium	ug/L	40	38.2	95	85-115	
Chromium	ug/L	40	40.2	100	85-115	
Selenium	ug/L	40	38.2	95	85-115	
Thallium	ug/L	40	36.7	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1979052 1979053

Parameter	Units	7568658001 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Spike Conc.	MS Result	MSD Result						
Antimony	ug/L	0.64J	40	40	38.0	38.4	93	94	70-130	1	20	
Arsenic	ug/L	0.38J	40	40	40.5	40.1	100	99	70-130	1	20	
Cadmium	ug/L	<0.089	40	40	35.1	34.9	88	87	70-130	1	20	
Chromium	ug/L	27.2	40	40	69.0	64.8	105	94	70-130	6	20	
Selenium	ug/L	<0.00043 mg/L	40	40	35.8	35.9	89	89	70-130	0	20	
Thallium	ug/L	0.00027J mg/L	40	40	39.0	38.9	97	97	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 483338

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60247466001

METHOD BLANK: 1979902

Matrix: Water

Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/29/17 16:18	

LABORATORY CONTROL SAMPLE: 1979903

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	959	96	80-120	

SAMPLE DUPLICATE: 1979904

Parameter	Units	60247576002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	909	947	4	10	

SAMPLE DUPLICATE: 1979905

Parameter	Units	60247365002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	479	470	2	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 482985 Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH

Associated Lab Samples: 60247466001

SAMPLE DUPLICATE: 1978459

Parameter	Units	60246810003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.5	1	5	H6

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 484403	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60247466001	

METHOD BLANK: 1984134 Matrix: Water  
Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	07/07/17 21:16	
Fluoride	mg/L	<0.10	0.20	0.10	07/07/17 21:16	

LABORATORY CONTROL SAMPLE: 1984135

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1984136 1984137

Parameter	Units	60247664001		1984137		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	7.7	5	5	13.1	107	110	80-120	1	15	
Fluoride	mg/L	0.21	2.5	2.5	2.8	103	105	80-120	2	15	

MATRIX SPIKE SAMPLE: 1984138

Parameter	Units	60247665001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L		3.9	5	8.8	99	80-120
Fluoride	mg/L		ND	2.5	2.7	101	80-120

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-FLY  
Pace Project No.: 60247466

QC Batch: 484481 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60247466001

METHOD BLANK: 1984615 Matrix: Water  
Associated Lab Samples: 60247466001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.50	1.0	0.50	07/08/17 08:55	

LABORATORY CONTROL SAMPLE: 1984616

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1984617 1984618

Parameter	Units	60247465001		1984618		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Sulfate	mg/L	26.4	10	10	36.3	35.5	99	91	80-120	2	15

MATRIX SPIKE SAMPLE: 1984619

Parameter	Units	60247466001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	23.8	10	34.0	102	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

**Sample: S-BMW-3S**      **Lab ID: 60247466001**      Collected: 06/26/17 16:34      Received: 06/28/17 03:30      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.316 ± 0.447 (0.758)</b> <b>C:NA T:93%</b>	pCi/L	07/12/17 11:39	13982-63-3	
Radium-228	EPA 904.0	<b>0.281 ± 0.343 (0.723)</b> <b>C:80% T:99%</b>	pCi/L	07/17/17 18:39	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 264503

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60247466001

METHOD BLANK: 1302867

Matrix: Water

Associated Lab Samples: 60247466001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.669 ± 0.359 (0.629) C:76% T:82%	pCi/L	07/17/17 15:54	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

QC Batch: 264096

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60247466001

METHOD BLANK: 1300978

Matrix: Water

Associated Lab Samples: 60247466001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.300 ± 0.314 (0.442) C:NA T:96%	pCi/L	07/12/17 11:06	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

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### 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.

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.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval).

Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

PASI-PA Pace Analytical Services - Greensburg

### ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.

H6 Analysis initiated outside of the 15 minute EPA required holding time.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-FLY

Pace Project No.: 60247466

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247466001	S-BMW-3S	EPA 200.7	483134	EPA 200.7	483166
60247466001	S-BMW-3S	EPA 200.8	483133	EPA 200.8	483165
60247466001	S-BMW-3S	EPA 7470	484651	EPA 7470	484817
60247466001	S-BMW-3S	EPA 903.1	264096		
60247466001	S-BMW-3S	EPA 904.0	264503		
60247466001	S-BMW-3S	SM 2540C	483338		
60247466001	S-BMW-3S	SM 4500-H+B	482985		
60247466001	S-BMW-3S	EPA 300.0	484403		
60247466001	S-BMW-3S	EPA 300.0	484481		

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Sample Condition Upon Receipt

WO#: 60247466
Barcode with number 60247466

Client Name: Golda

Courier: FedEx [ ] UPS [ ] VIA [ ] Clay [ ] PEX [ ] ECI [ ] Pace [ ] Xroads [x] Client [ ] Other [ ]

Tracking #: Pace Shipping Label Used? Yes [ ] No [x]

Custody Seal on Cooler/Box Present: Yes [x] No [ ] Seals intact: Yes [x] No [ ]

Packing Material: Bubble Wrap [ ] Bubble Bags [ ] Foam [ ] None [x] Other [ ]

Thermometer Used: T-266 / T-239 Type of Ice: Wet [x] Blue [ ] None [ ]

Cooler Temperature (°C): As-read 1.4/14.0 Corr. Factor CF +2.9 CF +0.2 Corrected 16/14.2

Date and initials of person examining contents: 6/28/17

Temperature should be above freezing to 6°C

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., PH, WT, N/A). Rows include Chain of Custody, Samples arrived, Short Hold Time, Rush Turn Around Time, Sufficient volume, Containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels, Multiple phases, pH preservation, Cyanide water checks, Trip Blank, Headspace, USDA Regulated Area, and Additional labels.

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

Person Contacted: Jami Check Date/Time: 6/28/17

Comments/ Resolution:

Project Manager Review: Jami Check Date: 6/28/17





January 02, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR - UWL  
Pace Project No.: 60258458

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on November 15, 2017. 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,



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

Enclosures

cc: Ryan Feldmann, Golder  
Jeffrey Ingram, Golder Associates  
John Suozzi, Golder Associates



## REPORT OF LABORATORY ANALYSIS

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## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

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### **Kansas Certification IDs**

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 17-016-0

Illinois Certification #: 200030

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

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## REPORT OF LABORATORY ANALYSIS

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## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60258458001	S-TMW-1	Water	11/15/17 10:10	11/15/17 14:15
60258458002	S-TMW-2	Water	11/15/17 11:20	11/15/17 14:15
60258458003	S-TMW-3	Water	11/15/17 12:30	11/15/17 14:15
60258458004	S-UG-3	Water	11/15/17 11:30	11/15/17 14:15
60258458005	S-SCL4A-DUP-1	Water	11/15/17 00:01	11/15/17 14:15
60258458006	S-SCL4A-FB-1	Water	11/15/17 11:15	11/15/17 14:15
60258162009	S-BMW-1S	Water	11/13/17 10:16	11/15/17 04:15
60258162010	S-BMW-3S	Water	11/13/17 09:26	11/15/17 04:15

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60258458001	S-TMW-1	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258458002	S-TMW-2	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258458003	S-TMW-3	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258458004	S-UG-3	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258458005	S-SCL4A-DUP-1	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258458006	S-SCL4A-FB-1	EPA 200.7	JGP	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258162009	S-BMW-1S	EPA 200.7	TDS	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258162010	S-BMW-3S	EPA 200.7	TDS	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-TMW-1**      **Lab ID: 60258458001**      Collected: 11/15/17 10:10      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>71.1J</b>	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:09	7440-42-8	
Calcium	<b>92200</b>	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:09	7440-70-2	M1
Iron	<b>71.3</b>	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:09	7439-89-6	
Magnesium	<b>16100</b>	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:09	7439-95-4	
Manganese	<b>261</b>	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:09	7439-96-5	
Potassium	<b>4510</b>	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:09	7440-09-7	
Sodium	<b>2900</b>	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:09	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>283</b>	mg/L	20.0	4.9	1		11/21/17 11:58		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>323</b>	mg/L	5.0	5.0	1		11/21/17 10:02		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>2.9</b>	mg/L	1.0	0.50	1		11/25/17 08:20	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.10	1		11/25/17 08:20	16984-48-8	
Sulfate	<b>39.8</b>	mg/L	5.0	2.5	5		11/26/17 09:16	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-TMW-2**      **Lab ID: 60258458002**      Collected: 11/15/17 11:20      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>87.8J</b>	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:20	7440-42-8	
Calcium	<b>117000</b>	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:20	7440-70-2	
Iron	<b>2490</b>	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:20	7439-89-6	
Magnesium	<b>20800</b>	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:20	7439-95-4	
Manganese	<b>416</b>	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:20	7439-96-5	
Potassium	<b>5020</b>	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:20	7440-09-7	
Sodium	<b>3600</b>	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:20	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>323</b>	mg/L	20.0	4.9	1		11/21/17 12:02		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>411</b>	mg/L	5.0	5.0	1		11/21/17 10:02		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.3</b>	mg/L	1.0	0.50	1		11/25/17 09:03	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.10	1		11/25/17 09:03	16984-48-8	
Sulfate	<b>31.4</b>	mg/L	2.0	1.0	2		11/26/17 09:30	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-TMW-3**      **Lab ID: 60258458003**      Collected: 11/15/17 12:30      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>89.9J</b>	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:24	7440-42-8	
Calcium	<b>137000</b>	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:24	7440-70-2	
Iron	<b>1820</b>	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:24	7439-89-6	
Magnesium	<b>24500</b>	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:24	7439-95-4	
Manganese	<b>614</b>	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:24	7439-96-5	
Potassium	<b>6260</b>	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:24	7440-09-7	
Sodium	<b>5740</b>	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:24	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>381</b>	mg/L	20.0	4.9	1		11/21/17 12:13		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>472</b>	mg/L	5.0	5.0	1		11/21/17 13:52		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>1.7</b>	mg/L	1.0	0.50	1		11/25/17 09:18	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.10	1		11/25/17 09:18	16984-48-8	
Sulfate	<b>59.0</b>	mg/L	5.0	2.5	5		11/26/17 09:44	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-UG-3**      **Lab ID: 60258458004**      Collected: 11/15/17 11:30      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>293</b>	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:28	7440-42-8	
Calcium	<b>126000</b>	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:28	7440-70-2	
Iron	<b>113</b>	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:28	7439-89-6	
Magnesium	<b>23000</b>	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:28	7439-95-4	
Manganese	<b>773</b>	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:28	7439-96-5	
Potassium	<b>5820</b>	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:28	7440-09-7	
Sodium	<b>32400</b>	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:28	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>334</b>	mg/L	20.0	4.9	1		11/21/17 12:18		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>521</b>	mg/L	5.0	5.0	1		11/21/17 13:52		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>70.0</b>	mg/L	5.0	2.5	5		11/26/17 09:59	16887-00-6	
Fluoride	<b>0.36</b>	mg/L	0.20	0.10	1		11/25/17 11:25	16984-48-8	
Sulfate	<b>45.6</b>	mg/L	5.0	2.5	5		11/26/17 09:59	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-SCL4A-DUP-1**      **Lab ID: 60258458005**      Collected: 11/15/17 00:01      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>73.6J</b>	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:31	7440-42-8	
Calcium	<b>97300</b>	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:31	7440-70-2	
Iron	<b>82.8</b>	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:31	7439-89-6	
Magnesium	<b>17200</b>	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:31	7439-95-4	
Manganese	<b>270</b>	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:31	7439-96-5	
Potassium	<b>4810</b>	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:31	7440-09-7	
Sodium	<b>3020</b>	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:31	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>270</b>	mg/L	20.0	4.9	1		11/21/17 12:24		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>349</b>	mg/L	5.0	5.0	1		11/21/17 13:53		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>3.1</b>	mg/L	1.0	0.50	1		11/25/17 11:39	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.10	1		11/25/17 11:39	16984-48-8	
Sulfate	<b>40.0</b>	mg/L	5.0	2.5	5		11/26/17 10:13	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-SCL4A-FB-1**      **Lab ID: 60258458006**      Collected: 11/15/17 11:15      Received: 11/15/17 14:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<3.5	ug/L	100	3.5	1	11/20/17 16:40	11/21/17 12:46	7440-42-8	
Calcium	<36.0	ug/L	100	36.0	1	11/20/17 16:40	11/21/17 12:46	7440-70-2	
Iron	<12.4	ug/L	50.0	12.4	1	11/20/17 16:40	11/21/17 12:46	7439-89-6	
Magnesium	<15.4	ug/L	50.0	15.4	1	11/20/17 16:40	11/21/17 12:46	7439-95-4	
Manganese	<1.8	ug/L	5.0	1.8	1	11/20/17 16:40	11/21/17 12:46	7439-96-5	
Potassium	<52.3	ug/L	500	52.3	1	11/20/17 16:40	11/21/17 12:46	7440-09-7	
Sodium	<28.4	ug/L	500	28.4	1	11/20/17 16:40	11/21/17 12:46	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	7.4J	mg/L	20.0	4.9	1		11/21/17 12:28		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		11/21/17 13:54		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		11/25/17 11:54	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		11/25/17 11:54	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		11/25/17 11:54	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-BMW-1S**      **Lab ID: 60258162009**      Collected: 11/13/17 10:16      Received: 11/15/17 04:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>118</b>	ug/L	100	3.5	1	11/18/17 12:30	11/25/17 17:47	7440-42-8	
Calcium	<b>156000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/25/17 17:47	7440-70-2	
Iron	<b>19.8J</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/25/17 17:47	7439-89-6	
Magnesium	<b>30900</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/25/17 17:47	7439-95-4	
Manganese	<b>580</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/25/17 17:47	7439-96-5	
Potassium	<b>395J</b>	ug/L	500	52.3	1	11/18/17 12:30	11/25/17 17:47	7440-09-7	
Sodium	<b>4850</b>	ug/L	500	28.4	1	11/18/17 12:30	11/25/17 17:47	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>448</b>	mg/L	20.0	4.9	1		11/27/17 08:48		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>526</b>	mg/L	5.0	5.0	1		11/17/17 16:03		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>7.7</b>	mg/L	1.0	0.50	1		12/01/17 19:02	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.10	1		12/01/17 19:02	16984-48-8	
Sulfate	<b>41.4</b>	mg/L	5.0	2.5	5		12/02/17 14:34	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

**Sample: S-BMW-3S**      **Lab ID: 60258162010**      Collected: 11/13/17 09:26      Received: 11/15/17 04:15      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>200.7 Metals, Total</b>		Analytical Method: EPA 200.7    Preparation Method: EPA 200.7							
Boron	<b>104</b>	ug/L	100	3.5	1	11/18/17 12:30	11/25/17 17:49	7440-42-8	
Calcium	<b>128000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/25/17 17:49	7440-70-2	
Iron	<b>516</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/25/17 17:49	7439-89-6	
Magnesium	<b>23800</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/25/17 17:49	7439-95-4	
Manganese	<b>782</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/25/17 17:49	7439-96-5	
Potassium	<b>664</b>	ug/L	500	52.3	1	11/18/17 12:30	11/25/17 17:49	7440-09-7	
Sodium	<b>4910</b>	ug/L	500	28.4	1	11/18/17 12:30	11/25/17 17:49	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>377</b>	mg/L	20.0	4.9	1		11/27/17 08:52		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>446</b>	mg/L	5.0	5.0	1		11/17/17 16:03		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.5</b>	mg/L	1.0	0.50	1		12/01/17 19:17	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.10	1		12/01/17 19:17	16984-48-8	
Sulfate	<b>28.2</b>	mg/L	2.0	1.0	2		12/02/17 14:49	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 503849 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60258162009, 60258162010

METHOD BLANK: 2063340 Matrix: Water

Associated Lab Samples: 60258162009, 60258162010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	9.8J	100	3.5	11/25/17 16:54	
Calcium	ug/L	<36.0	100	36.0	11/25/17 16:54	
Iron	ug/L	<12.4	50.0	12.4	11/25/17 16:54	
Magnesium	ug/L	<15.4	50.0	15.4	11/25/17 16:54	
Manganese	ug/L	<1.8	5.0	1.8	11/25/17 16:54	
Potassium	ug/L	<52.3	500	52.3	11/25/17 16:54	
Sodium	ug/L	<28.4	500	28.4	11/25/17 16:54	

LABORATORY CONTROL SAMPLE: 2063341

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	994	99	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Iron	ug/L	10000	10200	102	85-115	
Magnesium	ug/L	10000	9910	99	85-115	
Manganese	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	9890	99	85-115	
Sodium	ug/L	10000	9630	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063342 2063343

Parameter	Units	60257953001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Boron	ug/L	115	1000	1000	1130	1130	102	101	70-130	0	20		
Calcium	ug/L	156000	10000	10000	165000	169000	89	124	70-130	2	20		
Iron	ug/L	1900	10000	10000	12000	12000	101	101	70-130	0	20		
Magnesium	ug/L	42200	10000	10000	52200	53200	100	110	70-130	2	20		
Manganese	ug/L	2210	1000	1000	3210	3250	100	104	70-130	1	20		
Potassium	ug/L	5820	10000	10000	15900	16000	101	102	70-130	1	20		
Sodium	ug/L	10600	10000	10000	20500	20700	99	101	70-130	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063344 2063345

Parameter	Units	60258162001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Boron	ug/L	1390	1000	1000	2380	2430	99	104	70-130	2	20		
Calcium	ug/L	98500	10000	10000	109000	110000	105	112	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

Parameter	Units	2063344		2063345		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	RPD	Qual
		60258162001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result								
Iron	ug/L	<12.4	10000	10000	10100	10200	101	102	70-130	1	20		
Magnesium	ug/L	27200	10000	10000	36900	37300	97	101	70-130	1	20		
Manganese	ug/L	40.1	1000	1000	1040	1050	100	101	70-130	1	20		
Potassium	ug/L	7410	10000	10000	17300	17400	99	100	70-130	1	20		
Sodium	ug/L	28700	10000	10000	38700	39000	100	103	70-130	1	20		

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR - UWL

QC Project No.: 60258458

QC Batch: 504132 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

METHOD BLANK: 2064841 Matrix: Water  
 Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<3.5	100	3.5	11/21/17 12:02	
Calcium	ug/L	38.1J	100	36.0	11/21/17 12:02	
Iron	ug/L	<12.4	50.0	12.4	11/21/17 12:02	
Magnesium	ug/L	<15.4	50.0	15.4	11/21/17 12:02	
Manganese	ug/L	<1.8	5.0	1.8	11/21/17 12:02	
Potassium	ug/L	<52.3	500	52.3	11/21/17 12:02	
Sodium	ug/L	48.5J	500	28.4	11/21/17 12:02	

LABORATORY CONTROL SAMPLE: 2064842

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	924	92	85-115	
Calcium	ug/L	10000	9740	97	85-115	
Iron	ug/L	10000	9680	97	85-115	
Magnesium	ug/L	10000	9460	95	85-115	
Manganese	ug/L	1000	964	96	85-115	
Potassium	ug/L	10000	9440	94	85-115	
Sodium	ug/L	10000	9430	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2064843 2064844

Parameter	Units	60258458001		60258458002		60258458003		60258458004		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.				
Boron	ug/L	71.1J	1000	1000	1030	1050	95	98	70-130	2	20		
Calcium	ug/L	92200	10000	10000	103000	106000	111	140	70-130	3	20	M1	
Iron	ug/L	71.3	10000	10000	9720	9930	97	99	70-130	2	20		
Magnesium	ug/L	16100	10000	10000	25600	26400	96	103	70-130	3	20		
Manganese	ug/L	261	1000	1000	1230	1250	97	99	70-130	2	20		
Potassium	ug/L	4510	10000	10000	14200	14600	97	101	70-130	3	20		
Sodium	ug/L	2900	10000	10000	12500	12700	96	98	70-130	2	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504171

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

METHOD BLANK: 2065075

Matrix: Water

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<4.9	20.0	4.9	11/21/17 11:52	

LABORATORY CONTROL SAMPLE: 2065076

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	500	491	98	90-110	

SAMPLE DUPLICATE: 2065077

Parameter	Units	60258458002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	323	326	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504603

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60258162009, 60258162010

METHOD BLANK: 2067454

Matrix: Water

Associated Lab Samples: 60258162009, 60258162010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<4.9	20.0	4.9	11/27/17 08:42	

LABORATORY CONTROL SAMPLE: 2067455

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	500	496	99	90-110	

SAMPLE DUPLICATE: 2067456

Parameter	Units	60258162010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	377	361	4	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

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QC Batch: 503799	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60258162009, 60258162010	

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METHOD BLANK: 2062903 Matrix: Water

Associated Lab Samples: 60258162009, 60258162010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/17/17 15:33	

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LABORATORY CONTROL SAMPLE: 2062904

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

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SAMPLE DUPLICATE: 2062905

Parameter	Units	60258160003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1150	1060	8	10	

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SAMPLE DUPLICATE: 2062906

Parameter	Units	60258162004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	544	546	0	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504123

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60258458001, 60258458002

METHOD BLANK: 2064813

Matrix: Water

Associated Lab Samples: 60258458001, 60258458002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/21/17 09:37	

LABORATORY CONTROL SAMPLE: 2064814

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	985	99	80-120	

SAMPLE DUPLICATE: 2064815

Parameter	Units	60258414002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	869	865	0	10	

SAMPLE DUPLICATE: 2064816

Parameter	Units	60258414003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	880	891	1	10	

SAMPLE DUPLICATE: 2064817

Parameter	Units	60258414005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1130	1130	1	10	

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

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504283

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60258458003, 60258458004, 60258458005, 60258458006

METHOD BLANK: 2065519

Matrix: Water

Associated Lab Samples: 60258458003, 60258458004, 60258458005, 60258458006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/21/17 13:51	

LABORATORY CONTROL SAMPLE: 2065520

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	970	97	80-120	

SAMPLE DUPLICATE: 2065521

Parameter	Units	60258458003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	472	478	1	10	

SAMPLE DUPLICATE: 2065522

Parameter	Units	60258367001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	997	980	2	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504546

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

METHOD BLANK: 2067013

Matrix: Water

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005, 60258458006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	11/25/17 07:43	
Fluoride	mg/L	<0.10	0.20	0.10	11/25/17 07:43	
Sulfate	mg/L	<0.50	1.0	0.50	11/25/17 07:43	

LABORATORY CONTROL SAMPLE: 2067014

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	91	90-110	
Fluoride	mg/L	2.5	2.4	94	90-110	
Sulfate	mg/L	5	5.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2067015 2067016

Parameter	Units	60258458001		60258458002		60258458003		60258458004		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Chloride	mg/L	2.9	5	5	7.7	7.8	96	97	80-120	1	15		
Fluoride	mg/L	0.37	2.5	2.5	2.8	2.9	97	100	80-120	3	15		

MATRIX SPIKE SAMPLE: 2067017

Parameter	Units	60257950006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5.4	5	10.3	98	80-120	
Fluoride	mg/L	0.19J	2.5	2.6	95	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 504564

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005

METHOD BLANK: 2067306

Matrix: Water

Associated Lab Samples: 60258458001, 60258458002, 60258458003, 60258458004, 60258458005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	11/26/17 07:43	
Sulfate	mg/L	<0.50	1.0	0.50	11/26/17 07:43	

LABORATORY CONTROL SAMPLE: 2067307

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2067308 2067309

Parameter	Units	60257950006		2067309		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
Sulfate	mg/L	33.0	10	10	42.8	42.8	98	99	80-120	0	15	

MATRIX SPIKE SAMPLE: 2067310

Parameter	Units	60257953001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	83.3	50	133	99	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 505276 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60258162009, 60258162010

METHOD BLANK: 2069448 Matrix: Water

Associated Lab Samples: 60258162009, 60258162010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/01/17 20:02	
Fluoride	mg/L	<0.10	0.20	0.10	12/01/17 20:02	

LABORATORY CONTROL SAMPLE: 2069449

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2069450 2069451

Parameter	Units	60258160001 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	RPD	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Fluoride	mg/L	0.41	2.5	2.5	2.8	2.6	96	89	80-120	7	15		

MATRIX SPIKE SAMPLE: 2069452

Parameter	Units	60258162001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.41	2.5	2.9	98	80-120	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

QC Batch: 505662 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60258162009, 60258162010

METHOD BLANK: 2071159 Matrix: Water

Associated Lab Samples: 60258162009, 60258162010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.50	1.0	0.50	12/02/17 08:08	

LABORATORY CONTROL SAMPLE: 2071160

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2071161 2071162

Parameter	Units	60258162001		60258162004		60258162009		60258162010		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec						
Sulfate	mg/L	113	50	50	160	160	94	93	80-120	0	15		

MATRIX SPIKE SAMPLE: 2071163

Parameter	Units	60258162004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	34.6	10	44.5	99	80-120	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

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### 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.

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.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60258162009	S-BMW-1S	EPA 200.7	503849	EPA 200.7	503865
60258162010	S-BMW-3S	EPA 200.7	503849	EPA 200.7	503865
60258458001	S-TMW-1	EPA 200.7	504132	EPA 200.7	504227
60258458002	S-TMW-2	EPA 200.7	504132	EPA 200.7	504227
60258458003	S-TMW-3	EPA 200.7	504132	EPA 200.7	504227
60258458004	S-UG-3	EPA 200.7	504132	EPA 200.7	504227
60258458005	S-SCL4A-DUP-1	EPA 200.7	504132	EPA 200.7	504227
60258458006	S-SCL4A-FB-1	EPA 200.7	504132	EPA 200.7	504227
60258162009	S-BMW-1S	SM 2320B	504603		
60258162010	S-BMW-3S	SM 2320B	504603		
60258458001	S-TMW-1	SM 2320B	504171		
60258458002	S-TMW-2	SM 2320B	504171		
60258458003	S-TMW-3	SM 2320B	504171		
60258458004	S-UG-3	SM 2320B	504171		
60258458005	S-SCL4A-DUP-1	SM 2320B	504171		
60258458006	S-SCL4A-FB-1	SM 2320B	504171		
60258162009	S-BMW-1S	SM 2540C	503799		
60258162010	S-BMW-3S	SM 2540C	503799		
60258458001	S-TMW-1	SM 2540C	504123		
60258458002	S-TMW-2	SM 2540C	504123		
60258458003	S-TMW-3	SM 2540C	504283		
60258458004	S-UG-3	SM 2540C	504283		
60258458005	S-SCL4A-DUP-1	SM 2540C	504283		
60258458006	S-SCL4A-FB-1	SM 2540C	504283		
60258162009	S-BMW-1S	EPA 300.0	505276		
60258162009	S-BMW-1S	EPA 300.0	505662		
60258162010	S-BMW-3S	EPA 300.0	505276		
60258162010	S-BMW-3S	EPA 300.0	505662		
60258458001	S-TMW-1	EPA 300.0	504546		
60258458001	S-TMW-1	EPA 300.0	504564		
60258458002	S-TMW-2	EPA 300.0	504546		
60258458002	S-TMW-2	EPA 300.0	504564		
60258458003	S-TMW-3	EPA 300.0	504546		
60258458003	S-TMW-3	EPA 300.0	504564		
60258458004	S-UG-3	EPA 300.0	504546		
60258458004	S-UG-3	EPA 300.0	504564		
60258458005	S-SCL4A-DUP-1	EPA 300.0	504546		
60258458005	S-SCL4A-DUP-1	EPA 300.0	504564		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR - UWL

Pace Project No.: 60258458

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<b>Lab ID</b>	<b>Sample ID</b>	<b>QC Batch Method</b>	<b>QC Batch</b>	<b>Analytical Method</b>	<b>Analytical Batch</b>
60258458006	S-SCL4A-FB-1	EPA 300.0	504546		

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### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60258458



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T2100 Type of Ice: Wet Blue  None

Cooler Temperature (°C): As-read 0.5 Corr. Factor 0.0 Corrected 0.5

Date and initials of person examining contents: 0420  
CO

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jami Chack \_\_\_\_\_ Date: 11/20/17





Sample Condition Upon Receipt

WO#: 60258162



Client Name: Golder

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

Tracking #: \_\_\_\_\_ Pace Shipping Label Used? Yes  No

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

Packing Material: Bubble Wrap  Bubble Bags  Foam  None  Other

Thermometer Used: T-266 Type of Ice: Wet Blue  None

Cooler Temperature (°C): As-read 4.8 3.6 2.8 Corr. Factor 10.0 Corrected 4.8 3.6 2.8

Date and initials of person examining contents: JB 11/16

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
Containers requiring pH preservation in compliance? (HNO <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)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Cyanide water sample checks:	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

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

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: Jamie Chack 11/16/17

Project Manager Review: \_\_\_\_\_ Date: \_\_\_\_\_





# CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A**  
 Required Client Information:  
 Company: **Golder Associates**  
 Address: **820 South Main Street, Suite 100**  
 St Charles, MO 63301  
 Email To: **rmaddock@golder.com**  
 Phone: **636-724-9191** Fax: **636-724-9323**  
 Requested Due Date/TAT: **Standard**

**Section B**  
 Required Project Information:  
 Report To: **Mark Haddock (mhaddock@golder.com)**  
 Copy To: **Jeffrey Ingram**  
 Purchase Order No.:  
 Project Name: **Ameren Stou Energy Center - Fly Ash**  
 Project Number: **153-1406-0003F**

**Section C**  
 Invoice Information:  
 Attention:  
 Company Name:  
 Address:  
 Price Quote Reference:  
 Price Project Manager:  
 Price Profile #:

**REGULATORY AGENCY**  
 NPDES  GROUND WATER  
 UST RCRA  DRINKING WATER  
 OTHER

Site Location: **MO**  
 STATE:

ITEM #	Valid Matrix Codes <small>                     MATRIX CODE                      DRINKING WATER                      WASTE WATER                      WASTE WATER                      PRODUCT                      SOIL/SOLID                      OIL                      AIR                      OTHER                      TS                 </small>	SAMPLER TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	PRESERVATIVES	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Temp in °C	SAMPLE CONDITIONS		
			DATE	TIME							DATE	TIME	Received on Ice (Y/N)
1	S-LMW-DUP-2		11/14/17	10:50		2	Unpreserved	Y		48	Y	Y	Y
2	S-LMW-FB-1		11/14/17	08:55		1	H <sub>2</sub> SO <sub>4</sub>	Y		48	Y	Y	Y
3	S-LMW-FB-2		11/14/17	10:50		1	HNO <sub>3</sub>	Y		48	Y	Y	Y
4							NaOH						
5							Na <sub>2</sub> S <sub>2</sub> O <sub>5</sub>						
6							Methanol						
7							Other						
8							Metals*	Y					
9							C/F/SO <sub>4</sub> /Alkalinity	Y					
10							TDS	Y					
11													
12													

**ADDITIONAL COMMENTS**  
 \*EPA 200.7: B,Ca,Mg,K,Ns,Pg,Mn

RELINQUISHED BY / AFFILIATION: **Mark Haddock Golder** DATE: **11/14/17** TIME: **10:50**  
 SIGNATURE: *[Signature]*

ACCEPTED BY / AFFILIATION: **Richard W. Ingram** DATE: **11/14/17** TIME: **16:42**  
 SIGNATURE: *[Signature]*

SAMPLER NAME AND SIGNATURE: **Bri Weeks** DATE SIGNED (MM/DD/YYYY): **11/14/17**  
 PRINT Name of SAMPLER: **Bri Weeks**  
 SIGNATURE of SAMPLER: *[Signature]*



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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – BMW-1S – E1**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium and selenium was outside the recovery criteria range for MS and MSD. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux- BMW-15-E1  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 4/12/18

Laboratory: Pace Analytical SDG #: 60261378  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-BMW-15

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Ca(38.0), Sb(0.061), Cd(0.032),</u>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Ca(54/70-130)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Ca(54/70-130)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Comments/Notes:

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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E1**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).
- When a duplicate (i.e. field, sample) RPD was not met, associated samples were qualified as estimates (J).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- E1  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 1/18

Laboratory: Pace Analytical SDG #: 60261458  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWL-DUP-1, S-UWL-F8-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>5/15/16</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cu(11.4/11.5), Mo(0.57),</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cu(22.1), Cr(0.55)</u>
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1@ TMW-2</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>FB-1@ UG-3</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B, Cr</u>
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

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

**Comments/Notes:**

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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E2

**Project No.:** 1531406  
**Project:** Ameren  
**Email:**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium was outside the recovery criteria range for MS. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A-~~02~~  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 7/16/18

Laboratory: Pace Analytical SDG #: 60261459  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names ~~TMW-1~~ ~~TMW-2~~ ~~TMW-3~~ ~~UG-3~~ ~~S-BMW-15~~ ~~S-BMW-33~~ TR

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>6/14</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>56(0.099), H<sub>3</sub>(0.095)</u>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u><del>DUP 10-26-11</del> (12)</u> <u><del>Fb 10-26-11</del> (12)</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

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

**Comments/Notes:**

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

Data Qualification: *SCL4A E2*

Sample Name	Constituent(s)	Result	Qualifier	Reason
<i>All Sample</i>	<i>Antimony (Sb)</i>	<i>1.0</i>	<i>U</i>	<i>Detected in Blank; PQL &gt; Result &gt; MDL</i>
<i>UG-3</i>	<i>Chloride</i>	<i>37.6</i>	<i>D</i>	<i>Result had a dilution factor of 5</i>
<i>L</i>	<i>Sulfate</i>	<i>108</i>	<i> </i>	<i> </i> <span style="float: right;"><i>10</i></span>
<i>TMW-1</i>	<i> </i>	<i>23.2</i>	<i> </i>	<i> </i> <span style="float: right;"><i>2</i></span>
<i>TMW-2</i>	<i> </i>	<i>31.7</i>	<i> </i>	<i> </i> <span style="float: right;"><i>2</i></span>
<i>TMW-3</i>	<i> </i>	<i>52.4</i>	<i> </i>	<i> </i> <span style="float: right;"><i>5</i></span>
<i>(TA)</i>				

Signature: *Tommy J. Goodrich*

Date: *1/29/18*



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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E3

**Project No.:** 1531406  
**Project:** Ameren  
**Email:**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium and selenium was outside the recovery criteria range for MS and MSD. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- E3  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 1/17/18

Laboratory: Pace Analytical SDG #: 60223187  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, ~~S-BMW-2S~~ (12)

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>7/8/16</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

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

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

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

**Comments/Notes:**

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## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UG-3	Chloride	44.2	D	Result had a dilution factor (DF) of 5
L	Sulfate	61.0	I	5
S-TMW-1	I	25.7	I	2
S-TMW-2	I	34.3	I	2
S-TMW-3	I	51.8	I	5
S-BMW-15	I	30.2	I	2
TK				

Signature: Tommy J. Goodrich

Date: 1/18/18



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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E4**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a duplicate (i.e. field, sample) RPD was not met, associated samples were qualified as estimates (J). If the results were less than the method detection limit or detected in a blank the results were qualified as non-detects and estimates (UJ).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- EY  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 1/2/18

Laboratory: Pace Analytical SDG #: 60261460  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWL-DUP-1, S-UWL-FB-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>9/15/16</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B. (0.95)</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>C. (19.3)</u>
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1 @ S-TMW-2</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1 @ S-U6-3</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>G, G</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

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

**Comments/Notes:**

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## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-U6-3	Chloride	40.8	D	Result had a dilution factor of 5
	Sulfate	53.5	I	I 5
S-TMW-1	I	35.8	I	I 5
S-TMW-2	I	31.3	I	I 2
I	Cobalt (Co)	1.9	J	Result RPD exceeded limit; Result > MDL
	Chromium (Cr)	0.53	J	I I
S-UWL-DUP-1	Co	1.4	J	I
I	Cr	0.34	UJ	I ; MDL > Result
	Sulfate	31.4	D	DF of 2
S-TMW-3	I	57.5	D	I 5
S-BMW-15	I	23.4	D	I 2
(12)				

Signature: Tommy J. Wood

Date: 4/9/2018



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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E5**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium, Chloride, and Sulfate were outside the recovery criteria range for MS. Chloride exceeded the precision criteria for MS/MSD. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).
- When a duplicate (i.e. field, sample) RPD was not met, associated samples were qualified as estimates (J). If the results were less than the method detection limit or detected in a blank the results were qualified as non-detects and estimates (UJ).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- ES  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 1/19/18

Laboratory: Pace Analytical SDG #: 60261461  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWC-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>1/19/18</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: \_\_\_\_\_

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS <small>8mug</small>
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cu, Mo, Hg, Sb, Cd</u>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DVP-1 @ 5-UG-3</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Be (47.1), Mo (21.1)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>TDS (21/20)</u>

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Cu (67/70-120), Chloride (185/20-120), Sulfate (18)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Chloride (18)</u>

**Comments/Notes:**

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## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-TMW-1	TDS	48.3	J	RPD not met; Result > MDL
	Molybdenum (Mo)	20.0	U	Detected in Blank; PQL > Result > MDL
	Sulfate	32.5	D	Result had a dilution factor (DF) of 5
S-TMW-2	↓	30.0	D	↓ 5
↓	Mo	20.0	U	Blank; PQL > Result > MDL
S-TMW-3	↓	20.0	U	↓ ↓
↓	Sulfate	52.5	D	DF of 5
S-UG-3	Chloride	28.9	D	↓ 5
	Sulfate	47.4	D	↓ 5
	Mo	20.0	U	Blank; PQL > Result > MDL
	Beryllium (Be)	0.26	UJ	RPD exceeded limit; MDL > Result
	Be	0.42	J	↓ ↓
S-UWL-DUP-1	Mo	20.0	U	Blank; PQL > Result > MDL
	Chloride	29.1	D	DF of 5
	Sulfate	47.9	D	↓ 5
S-BMW-15	↓	34.8	D	↓ 2
↓	Mo	20.0	U	Blank; PQL > Result > MDL
S-BMW-35	Antimony (Sb)	1.0	U	
	Cadmium (Cd)	0.50	U	
		Mercury (Hg)	0.20	U
↓		Sulfate	28.2	D
				(T6)

Signature: Tommy J. Good Jr.

Date: 1/19/2018



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## MEMORANDUM

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**Date:** July 24, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – BMW-3S MAKEUP 1**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003 8  
 Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60233959  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names: S-BMW-33 (2) 35

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B<sub>2</sub>(1.8)</u>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS(3)</u>

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

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

**Comments/Notes:**

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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** **DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E6**

**Project No.:** 1531406  
**Project:** Ameren  
**Email:**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium and Chloride were outside the recovery criteria range for MS. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).
- When a duplicate (i.e. field, sample) RPD was not met, associated samples were qualified as estimates (J).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- EC  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 7/19/18

Laboratory: Pace Analytical SDG #: 60261462  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWL-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cu(24.6), Pb(2.9), Cd(0.033),</u>
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1 @ S-UG-3</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>B(20.8), As(79.1)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Cu(142/70-130)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Cu(147/70-130)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Comments/Notes:

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

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UG-3	Lead (Pb)	5.0	U	Detected in Blank; PQL > Result > MDL
I	Cadmium (Cd)	0.50	U	L L
	Boron (B)	218	J	RPD exceeded limit; Result > MDL
	Chloride	34.2	D	Result had a dilution factor (DF) of 2
	Sulfate	62.7	D	5
S-UWL-DUP-1	Chloride	35.2	D	L 2
I	Sulfate	63.6	D	5
	B	177	J	RPD exceeded limit; Result > MDL
	Pb	5.0	U	Blank; PQL > Result > MDL
	Cd	0.50	U	L L
S-TMW-1	Pb	5.0	U	L L
L	Sulfate	37.7	D	DF of 5
S-TMW-2	L	32.5	D	L 2
L	Pb	5.0	U	Blank; PQL > Result > MDL
S-TMW-3	L	5.0	U	L L
L	Sulfate	55.7	D	DF of 5
S-BMW-1S	L	26.5	D	L 2
L	Cd	0.50	U	Blank; PQL > Result > MDL
S-BMW-3S	Sulfate	24.7	D	DF of 2
(T <sub>2</sub> )				

Signature: Tommy J. Goodwin

Date: 1/19/2018



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## MEMORANDUM

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**Date:** July 24, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – BMW-3S MAKEUP 2

**Project No.:** 1531406  
**Project:** Ameren  
**Email:**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.00038  
 Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60237185  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-BMW-25 3S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Hg (0.10), Sb (0.18),</u> _____
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS (S)</u> _____

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

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

**Comments/Notes:**

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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E7**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Calcium and Chloride were outside the recovery criteria range for MS. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).
- When a duplicate (i.e. field, sample) RPD was not met, associated samples were qualified as estimates (J). If the results were less than the method detection limit or detected in a blank the results were qualified as non-detects and estimates (UJ).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- E7  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 4/9/18

Laboratory: Pace Analytical SDG #: 60261463  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWL-DUP-1, S-UWL-FB-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>3/17/17</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B(13.6), Be(0.18), As(0.060), Cr(0.23)/0.17</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cr(0.76), TDS(10.5)</u>
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1 @ S-TMW-2</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1 @ S-TMW-3</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Be(31.6), Ca(26.2), Se(24.5), Tl(148)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Ca (41/70-130)</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

**Comments/Notes:**

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

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UG-3	Chloride	71.9	D	Result had a dilution factor (DF) of 5
┆	Sulfate	52.3	D	┆ 5
S-TMW-1	Sulfate	38.0	D	┆ 5
┆	Boron (B)	100	U	Detected in blank; PQL > Result > MDL
S-TMW-2	┆	100	U	┆ ┆
┆	Beryllium (Be)	1.0	UJ	RPD exceeded limit; Detected in Blank; PQL > Result > MDL
┆	Cobalt (Co)	0.73	UJ	┆ ; MDL > Result
┆	Selenium (Se)	0.086	UJ	┆ ; ┆
┆	Thallium (Tl)	0.24	J	┆ ; Result > MDL
┆	Sulfate	33.2	D	DF of 2
S-UWL-DUP-1	┆	31.7	D	┆ 5
┆	Be	0.16	UJ	RPD exceeded limit; MDL > Result
┆	Tl	0.036	UJ	┆ ; ┆
┆	Co	0.95	J	┆ ; Result > MDL
┆	Se	0.11	J	┆ ; ┆
┆	B	100	U	Blank; PQL > Result > MDL
S-TMW-3	Chromium (Cr)	1.5	U	Blank; 5x FB > Result > PQL
┆	Sulfate	60.9	D	DF of 5
S-UWL-FB-1	Cr	1.0	U	Blank; PQL > Result > MDL
S-BMW-1S	┆	1.0	U	┆ ┆
┆	Sulfate	27.6	D	DF of 2
S-BMW-3S	┆	26.1	D	┆ 2
┆	B	100	U	Blank; PQL > Result > MDL
┆	Cr	1.0	U	┆ ┆
				(TR)

Signature: *Tommy J. Goodrich*

Date: 1/19/2018



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## MEMORANDUM

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**Date:** July 24, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – BMW-3S MAKEUP 3**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-Fly-LMW ME E3  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003B  
 Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60241394  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-BMW-3810 35

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TDS(u) _____

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

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

**Comments/Notes:**

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## MEMORANDUM

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**Date:** January 19, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – E8**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U). If the sample results were greater than the PQL, but less than 10 times the blank detection result, the detections were recorded at the results value and qualified as non-detects (U).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- E8  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003  
 Validation Date: 7/12/18

Laboratory: Pace Analytical SDG #: 60261465  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMW-2, S-TMW-3, S-UG-3, S-BMW-1S, S-BMW-3S, S-UWL-F8-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(0.38) Bc(0.44), Cu(36.1), Li(3.3), Tl(0.043)
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Be(0.50), Cu(54.2), Cr(0.21)
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FB-1@ TMW-3
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

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

Comments/Notes:

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification: SCLYA ER

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UG-3	Lithium (Li)	33	U	Detected in blank; 10xMB > Result > PQL
┆	Chloride	52.3	D	Result had a dilution factor (DF) of 5
┆	Sulfate	123	D	┆ 10
S-TMW-1	Sulfate	27.4	D	┆ 5
┆	Li	24.8	U	Blank; 10xMB > Result > PQL
S-TMW-2	Li	28.8	U	┆ ┆
┆	Sulfate	31.1	D	DF of 2
S-TMW-3	Sulfate	52.9	D	┆ 5
┆	Li	29.6	U	Blank; 10xMB > Result > PQL
┆	Chromium (Cr)	1.0	U	PQL > Result > MDL
S-UWL-FB-1	Calcium (Ca)	100	U	┆ ┆
S-BMW-1S	Thallium (Tl)	1.0	U	┆ ┆
┆	Beryllium (Be)	1.0	U	┆ ┆
┆	Sulfate	23.1	D	DF of 2
S-BMW-3S	Sulfate	25.0	D	┆ 2
┆	Be	1.0	U	Blank; PQL > Result > MDL
┆	Li	10.0	U	┆ ┆
S-UG-3	Be	1.0	U	┆ ┆
S-TMW-3	┆	┆	U	┆ ┆
				(TR)

Signature: Tommy J. Woodruff

Date: 1/19/2018



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## MEMORANDUM

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**Date:** July 24, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – BMW-3S MAKEUP 4**

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

- Analysis of pH for all samples was initiated outside of the 15 minute EPA required holding time. Field measurements of pH were taken at the time of sample collection.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the MDL and less than the PQL the results were recorded at the PQL value and qualified as non-detects (U).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Goldier Associates  
 Project Name: Ameren-Sioux  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003 B  
 Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60247466  
 Analytical Method (type and no.): Metals 200.7&200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 903.1&904.0  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names: S-BMW-38-10 35

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	_____
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
Note Deficiencies: _____				
_____				
_____				

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

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

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

<b>Blanks</b>	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Be(0.31), Cr(0.080)
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

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

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

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

**Comments/Notes:**

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## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-BMW-33	Sulfate	238	D	Dilution of 2
"	Chromium (Cr)	1.0	U	Detected in Method Blank; Result $\ll$ PQL

Signature: Tommy J. Newell

Date: 7/24/2017



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## MEMORANDUM

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**Date:** January 3, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. SCL4A – D.M. NOV. 2017

**Project No.:** 1531406  
**Project:** Ameren  
**Email:**

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

- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- 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

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-SCL4A- D.M. Nov 2017  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003H  
 Validation Date: 1/3/18

Laboratory: Pace Analytical SDG #: 60258458  
 Analytical Method (type and no.): 200.7 Metals, Total; 2320B Alkalinity; 2540C TDS; 300.0 IC Anions  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-TMW-1, S-TMS-2, S-TMW-3, S-UG-3, S-SCL4A-DUP-1, S-SCL4A-FB-1, S-BMW-1S, S-BMW-3S

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Grab
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

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

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

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<sup>-09,-10</sup> B(9.8); Ca(38.1), Ni(48.5)
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<sup>-01--06</sup> Alk(7.4)
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DUP-1 @ S-TMU-1
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FB-1 @ S-V6-3
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ca(140)
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

**Comments/Notes:**

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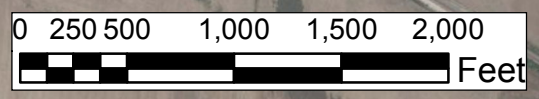
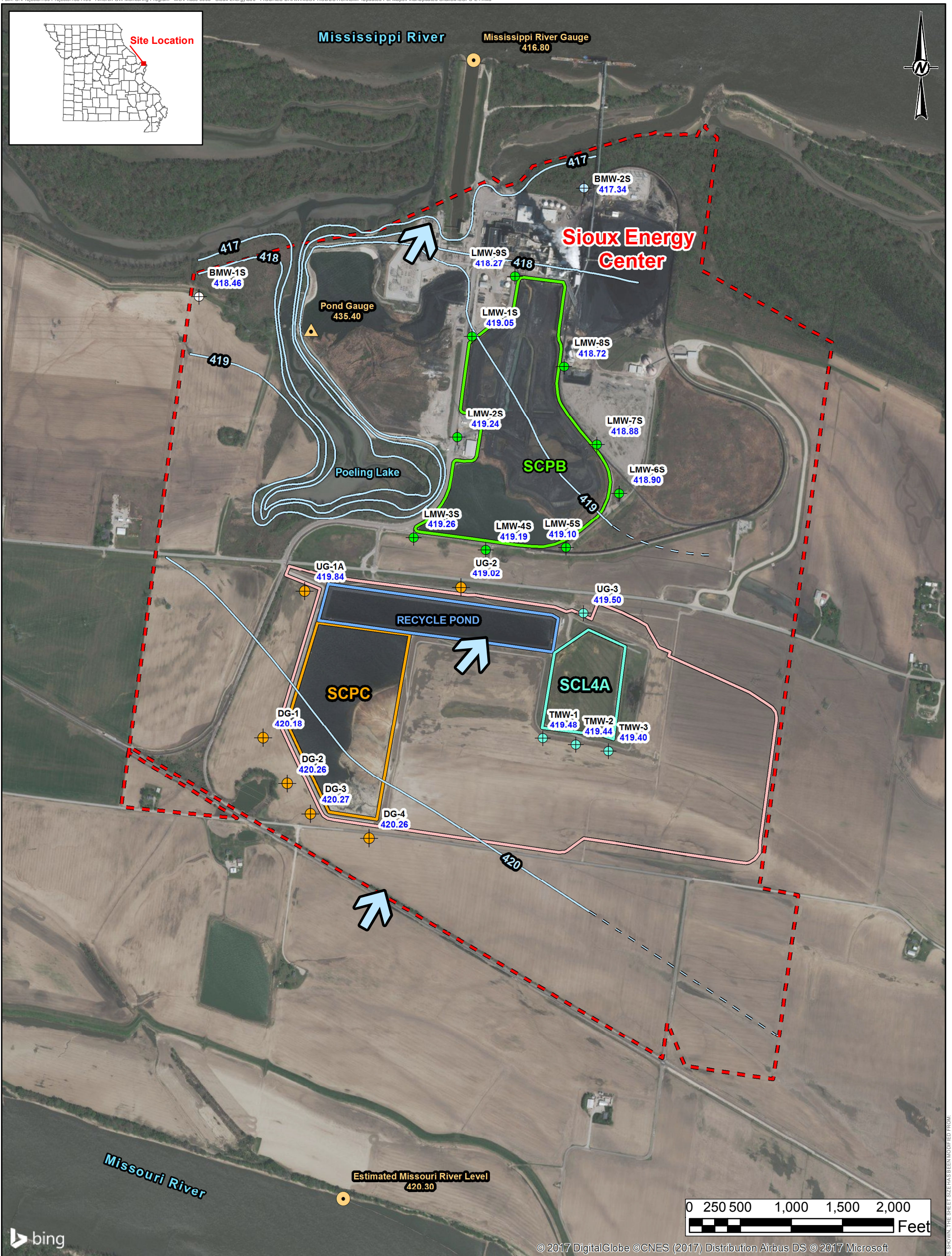


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# **APPENDIX C – POTENTIOMETRIC SURFACE MAPS**



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- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - SCL4A - UWL Cell 4A Monitoring Well
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPB - Fly Ash Surface Impoundment Monitoring Well
  - SCPC - WFGD Surface Impoundment Monitoring Well
  - SPCA Pond Gauge
  - River Elevation
  - Utility Waste Landfill (UWL)**
  - SCL4A - UWL Cell 4A Impoundment
  - SCPC - WFGD Surface Impoundment
  - Water Recycle Pond
  - UWL Future Perimeter Fence
  - Groundwater Elevation Contours**
  - Groundwater Elevation Contour (FT MSL)
  - Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
  - 2.) GOLDER GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14, APRIL 29, AND DECEMBER 8, 2016.
  - 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
  - 4.) GROUNDWATER MEASUREMENTS OBTAINED BY GOLDER.
  - 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY USGS (UNITED STATES GEOLOGICAL SURVEY) RIVER GAUGING LOCATIONS.
  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
  - 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
  - 8.) UWL BOUNDARIES, DESIGNATIONS AND STATE MONITORING WELL LOCATIONS BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).
  - 9.) WFGD - WET FLUE GAS DESULFURIZATION.
- REFERENCE**
- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
  - 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
  - 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).
  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
AMEREN MISSOURI  
SIOUX ENERGY CENTER

**PROJECT**  
CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
SCPC POTENTIOMETRIC SURFACE MAP  
BACKGROUND EVENT 1 - MAY 9, 2016

**CONSULTANT**  
Golder Associates

**DATE**  
2016-05-25

**PREPARED**  
JSI

**DESIGN**  
JSI

**REVIEW**  
JS

**APPROVED**  
MNH

**PROJECT No.**  
153-1406

**PHASE**  
0003D

**FIGURE**  
P1

**Ameren**

**Golder Associates**

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



**LEGEND**

- - - Sioux Energy Center Property Boundary
- SCPC - WFGD Surface Impoundment
- Water Recycle Pond
- UWL Future Perimeter Fence
- + SCL4A - UWL Cell 4A Monitoring Well
- + SCPC - WFGD Surface Impoundment Monitoring Well
- + River Elevation
- SCL4A - UWL Cell 4A
- Groundwater Elevation Contour (FT MSL)
- - - Inferred Groundwater Elevation Contour (FT MSL)
- ↗ Groundwater Flow Direction

**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GOLDER GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14, APRIL 29, AND DECEMBER 8, 2016.
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- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY USGS (UNITED STATES GEOLOGICAL SURVEY) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) UWL BOUNDARIES, DESIGNATIONS AND STATE MONITORING WELL LOCATIONS BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).
- 8.) WFGD - WET FLUE GAS DESULFURIZATION.

**REFERENCE**

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- 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
**AMEREN MISSOURI**  
**SIOUX ENERGY CENTER**

**PROJECT**  
**CCR GROUNDWATER MONITORING PROGRAM**

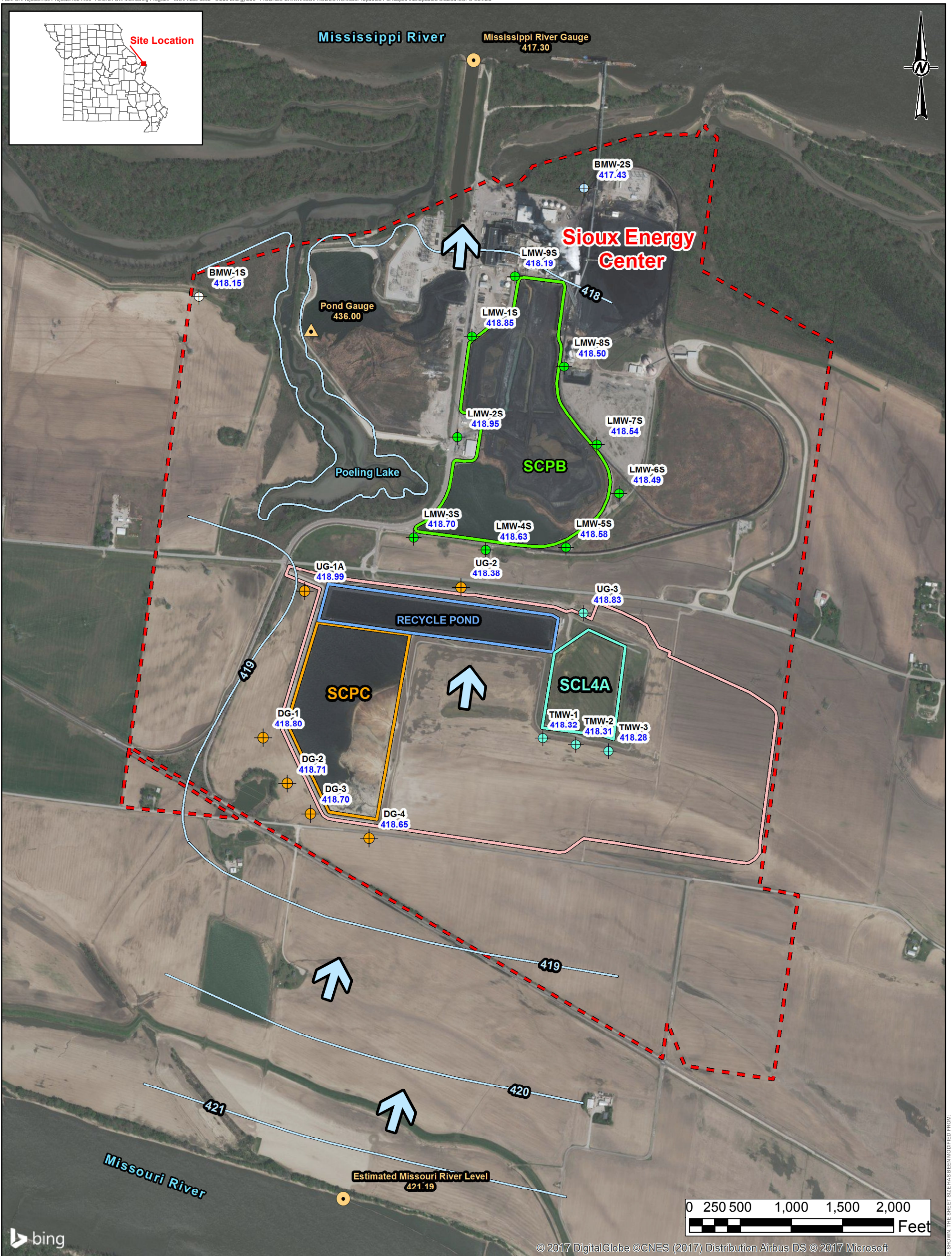
**TITLE**  
**SCL4A POTENTIOMETRIC SURFACE MAP**  
**BACKGROUND EVENT 2 - JUNE 13, 2016**

**CONSULTANT**  
**Golder Associates**

CLIENT	AMEREN MISSOURI	AMEREN
PROJECT	SIOUX ENERGY CENTER	
TITLE	SCL4A POTENTIOMETRIC SURFACE MAP	
BACKGROUND EVENT 2 - JUNE 13, 2016		
CONSULTANT	GOLDER ASSOCIATES	
DATE	2016-05-25	
PREPARED BY	JSI	
DESIGN BY	JSI	
REVIEW BY	JS	
APPROVED BY	MNH	

PROJECT No. 153-1406      PHASE 0003D      FIGURE P2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11x17 TO 11x8.5



- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - SCL4A - UWL Cell 4A Monitoring Well
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPB - Fly Ash Surface Impoundment Monitoring Well
  - SCPC - WFGD Surface Impoundment Monitoring Well
  - SPCA Pond Gauge
  - River Elevation
  - Utility Waste Landfill (UWL)**
  - SCL4A - UWL Cell 4A Impoundment
  - SCPC - WFGD Surface Impoundment
  - Water Recycle Pond
  - UWL Future Perimeter Fence
  - Groundwater Elevation Contours**
  - Groundwater Elevation Contour (FT MSL)
  - Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
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  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
AMEREN MISSOURI  
SIOUX ENERGY CENTER

**PROJECT**  
CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
SCL4A POTENTIOMETRIC SURFACE MAP  
BACKGROUND EVENT 3 - JULY 5, 2016

**CONSULTANT**  
Golder Associates

**DATE**  
2016-08-16

**PREPARED** JS  
**DESIGN** JS  
**REVIEW** JSI  
**APPROVED** MNH

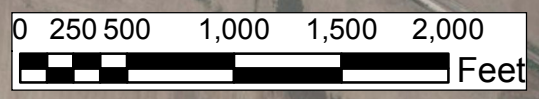
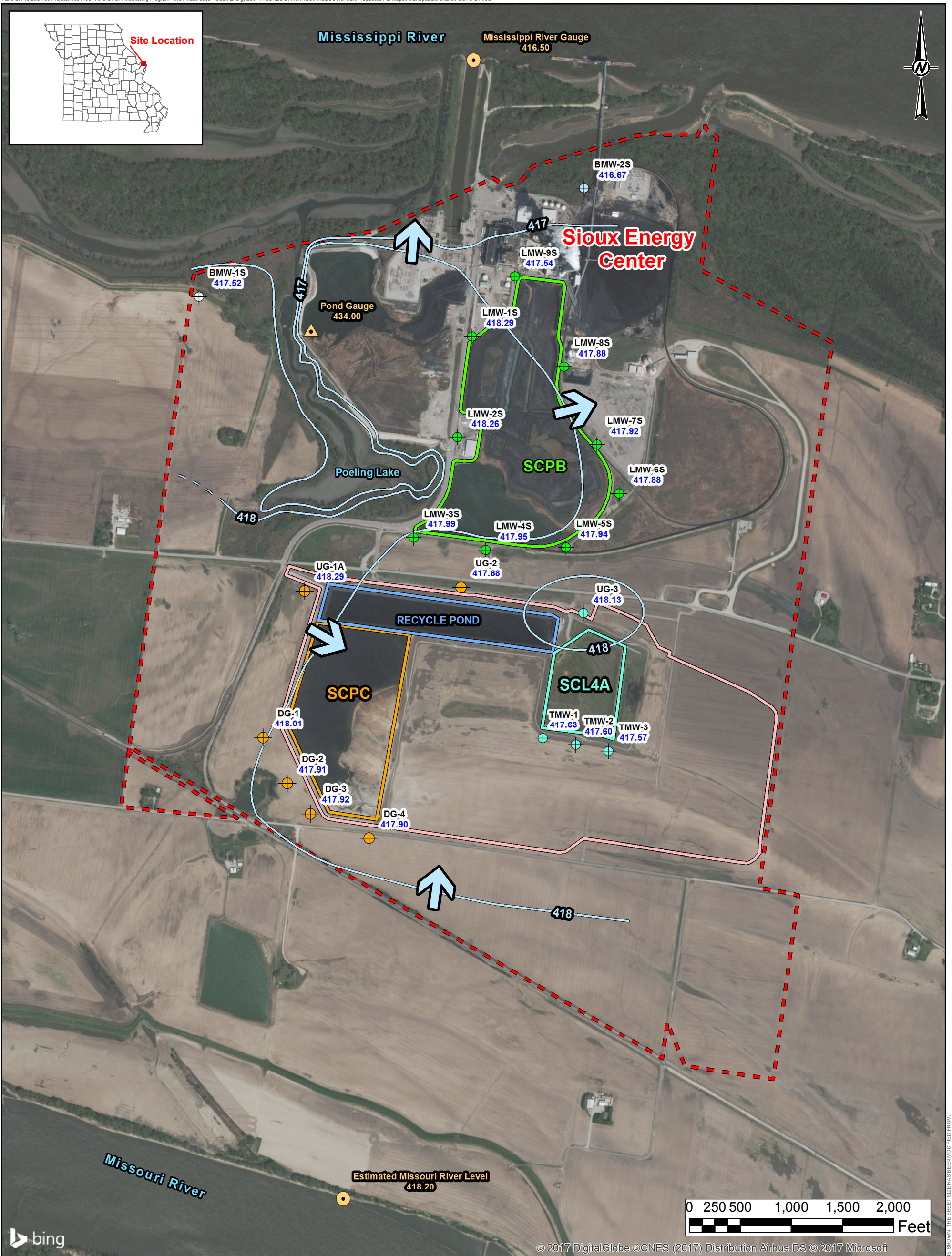
**PROJECT No.** 153-1406  
**PHASE** 0003D

**FIGURE** P3

0 250 500 1,000 1,500 2,000 Feet

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



**LEGEND**

Sioux Energy Center Property Boundary	SPCA Pond Gauge
SCPB - Fly Ash Surface Impoundment	River Elevation
<b>Ground/Surface Water Measurement Locations</b>	<b>Utility Waste Landfill (UWL)</b>
SCL4A - UWL Cell 4A Monitoring Well	SCL4A - UWL Cell 4A Impoundment
Groundwater Elevation Piezometer	SCPC - WFGD Surface Impoundment
Background Monitoring Well	Water Recycle Pond
SCPB - Fly Ash Surface Impoundment Monitoring Well	UWL Future Perimeter Fence
SCPC - WFGD Surface Impoundment Monitoring Well	<b>Groundwater Elevation Contours</b>
Groundwater Flow Direction	Groundwater Elevation Contour (FT MSL)
	Inferred Groundwater Elevation Contour (FT MSL)

**NOTES**

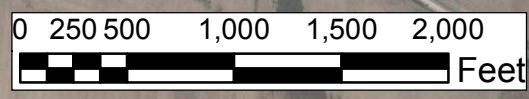
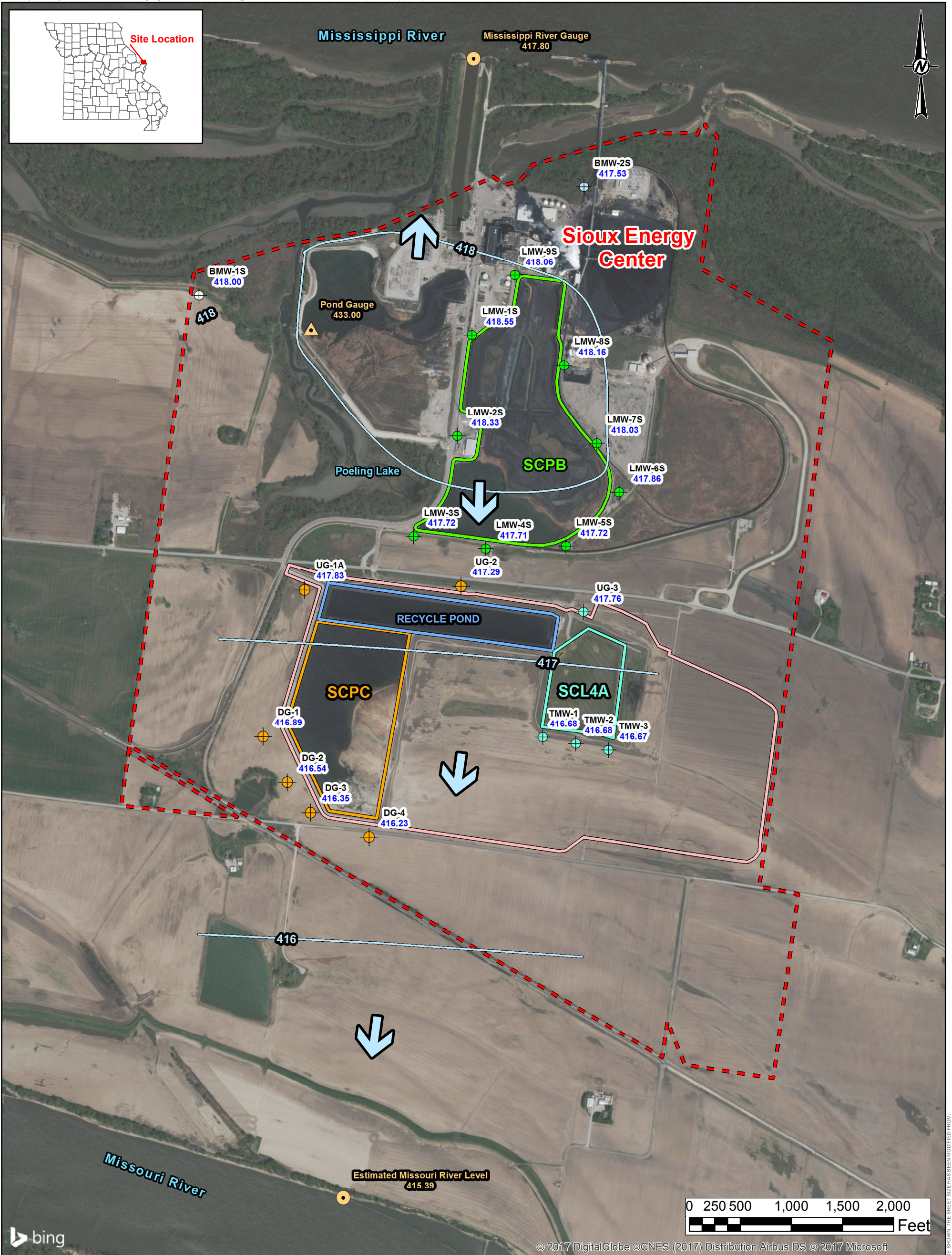
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- 9.) WFGD - WET FLUE GAS DESULFURIZATION.

**REFERENCE**

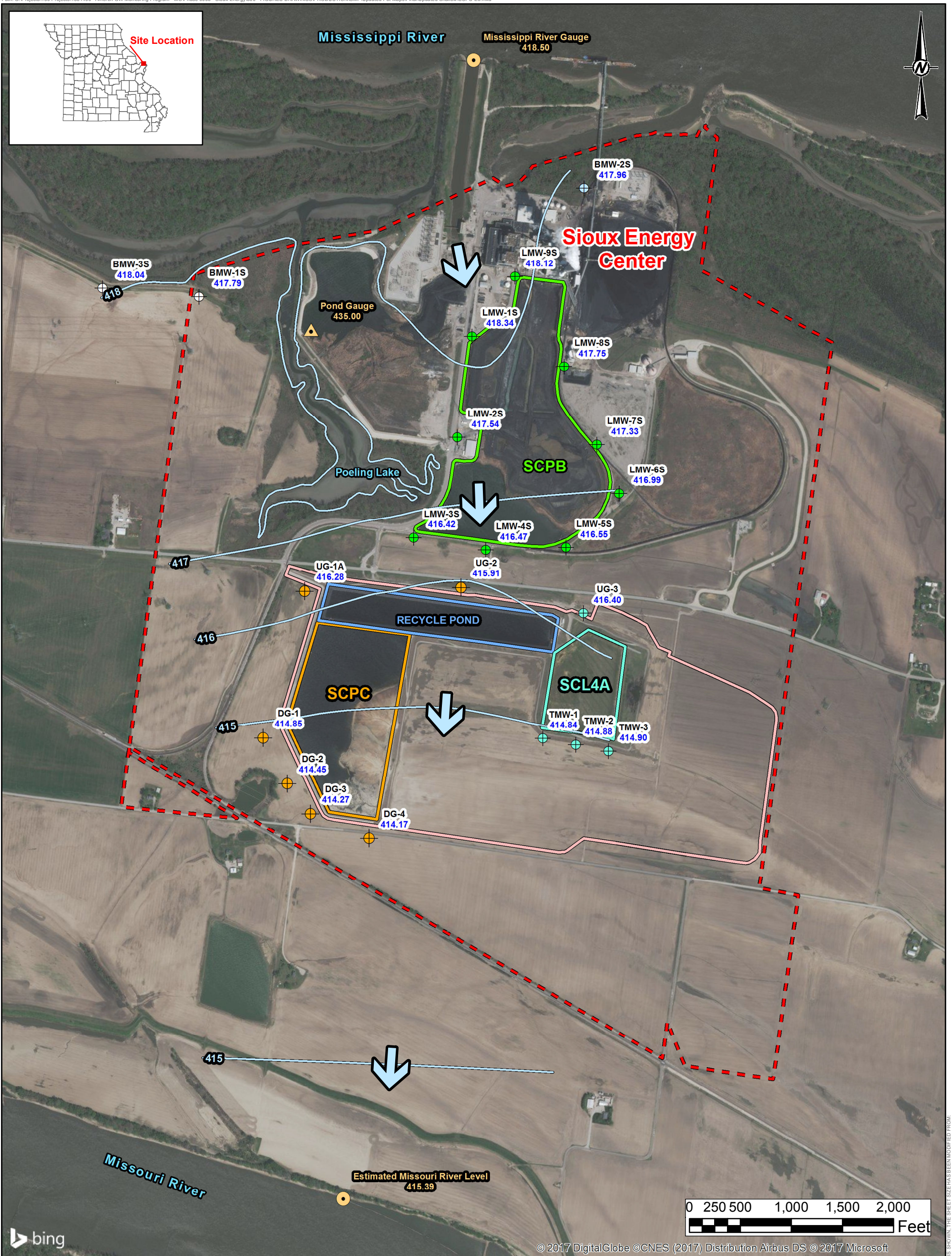
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- 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
- 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).
- 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

<b>CLIENT</b>	AMEREN MISSOURI SIOUX ENERGY CENTER	
<b>PROJECT</b>	CCR GROUNDWATER MONITORING PROGRAM	
<b>TITLE</b>	SCL4A POTENTIOMETRIC SURFACE MAP BACKGROUND EVENT 4 - SEPTEMBER 14, 2016	
<b>CONSULTANT</b>	Golder Associates	
	YYYY-MM-DD	2016-09-27
	PREPARED	JSI
	DESIGN	JSI
	REVIEW	JS
	APPROVED	MNH
<b>PROJECT No.</b>	153-1406	<b>PHASE</b>
		0003D
		<b>FIGURE</b>
		<b>P4</b>

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



<p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">- - -</span> Sioux Energy Center Property Boundary</li> <li><span style="border: 2px solid green; padding: 2px;"> </span> SCPB - Fly Ash Surface Impoundment</li> <li><b>Ground/Surface Water Measurement Locations</b></li> <li><span style="color: green;">+</span> SCL4A - UWL Cell 4A Monitoring Well</li> <li><span style="color: blue;">+</span> Groundwater Elevation Piezometer</li> <li><span style="color: blue;">+</span> Background Monitoring Well</li> <li><span style="color: green;">+</span> SCPB - Fly Ash Surface Impoundment Monitoring Well</li> <li><span style="color: orange;">+</span> SCPC - WFGD Surface Impoundment Monitoring Well</li> <li><span style="color: orange;">+</span> SPCA Pond Gauge</li> <li><span style="color: orange;">+</span> River Elevation</li> <li><b>Utility Waste Landfill (UWL)</b></li> <li><span style="border: 1px solid cyan; padding: 2px;"> </span> SCL4A - UWL Cell 4A Impoundment</li> <li><span style="border: 1px solid orange; padding: 2px;"> </span> SCPC - WFGD Surface Impoundment</li> <li><span style="border: 1px solid blue; padding: 2px;"> </span> Water Recycle Pond</li> <li><span style="border: 1px solid red; padding: 2px;"> </span> UWL Future Perimeter Fence</li> <li><b>Groundwater Elevation Contours</b></li> <li><span style="color: blue;">—</span> Groundwater Elevation Contour (FT MSL)</li> <li><span style="color: blue;">- - -</span> Inferred Groundwater Elevation Contour (FT MSL)</li> <li><span style="color: blue;">→</span> Groundwater Flow Direction</li> </ul>		<p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.</li> <li>2.) GOLDER GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14, APRIL 29, AND DECEMBER 8, 2016.</li> <li>3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).</li> <li>4.) GROUNDWATER MEASUREMENTS OBTAINED BY GOLDER.</li> <li>5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY USGS (UNITED STATES GEOLOGICAL SURVEY) RIVER GAUGING LOCATIONS.</li> <li>6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.</li> <li>7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.</li> <li>8.) UWL BOUNDARIES, DESIGNATIONS AND STATE MONITORING WELL LOCATIONS BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).</li> <li>9.) WFGD - WET FLUE GAS DESULFURIZATION.</li> </ol> <p><b>REFERENCE</b></p> <ol style="list-style-type: none"> <li>1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.</li> <li>2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.</li> <li>3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).</li> <li>4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.</li> </ol>	<p><b>CLIENT</b> AMEREN MISSOURI SIOUX ENERGY CENTER</p> <p><b>PROJECT</b> CCR GROUNDWATER MONITORING PROGRAM</p> <p><b>TITLE</b> SCL4A POTENTIOMETRIC SURFACE MAP BACKGROUND EVENT 5 - NOVEMBER 7, 2016</p> <p><b>CONSULTANT</b></p> <p style="text-align: right;"><b>Ameren</b></p>
<p><b>PROJECT No.</b> 153-1406</p> <p><b>PHASE</b> 0003D</p>	<p>YYYY-MM-DD 2016-11-07</p> <p>PREPARED JSI</p> <p>DESIGN JSI</p> <p>REVIEW MSG</p> <p>APPROVED MNH</p>	<p><b>Golder Associates</b></p>	
<p>© 2017 DigitalGlobe ©CNES (2017) Distribution Airbus DS © 2017 Microsoft</p>		<p><b>FIGURE</b> P5</p>	



- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - SCL4A - UWL Cell 4A Monitoring Well
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPB - Fly Ash Surface Impoundment Monitoring Well
  - SCPC - WFGD Surface Impoundment Monitoring Well
  - SPCA Pond Gauge
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  - Utility Waste Landfill (UWL)**
  - SCL4A - UWL Cell 4A Impoundment
  - SCPC - WFGD Surface Impoundment
  - Water Recycle Pond
  - UWL Future Perimeter Fence
  - Groundwater Elevation Contours**
  - Groundwater Elevation Contour (FT MSL)
  - Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
  - 2.) GOLDER GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14, APRIL 29, AND DECEMBER 8, 2016.
  - 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
  - 4.) GROUNDWATER MEASUREMENTS OBTAINED BY GOLDER.
  - 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY USGS (UNITED STATES GEOLOGICAL SURVEY) RIVER GAUGING LOCATIONS.
  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
  - 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
  - 8.) UWL BOUNDARIES, DESIGNATIONS AND STATE MONITORING WELL LOCATIONS BASED ON DRAWINGS IN THE UWL PROPOSED LANDFILL PERMIT (#0918301).
  - 9.) WFGD - WET FLUE GAS DESULFURIZATION.
- REFERENCE**
- 1.) AMEREN MISSOURI SIOUX ENERGY CENTER, SIOUX PROPERTY CONTROL MAP, FEBRUARY 2011.
  - 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2,401 FEET.
  - 3.) USGS NATIONAL WATER INFORMATION SYSTEM, USGS GAUGES 06935965 (ST. CHARLES), 07010000 (ST. LOUIS), 05587498 (ALTON), GRAFTON (05587450).
  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCL4A POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 6 - JANUARY 3, 2017

**CONSULTANT**  
 Golder Associates

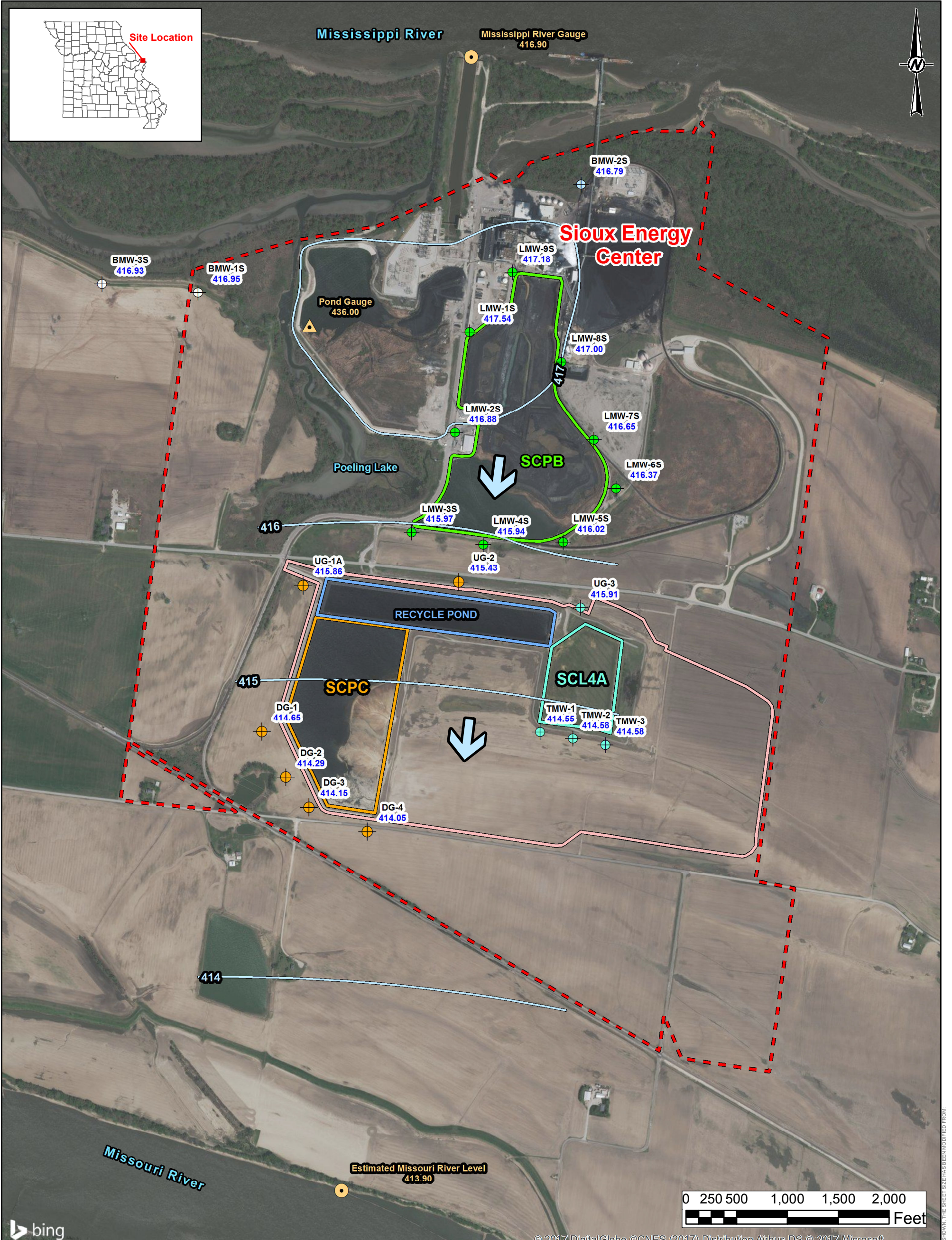
**PROJECT No.**  
 153-1406

**PHASE**  
 0003D

CLIENT	AMEREN MISSOURI	AMEREN
PROJECT	SIOUX ENERGY CENTER	
TITLE	CCR GROUNDWATER MONITORING PROGRAM	
CONSULTANT	GOLDER ASSOCIATES	
DATE	2017-01-03	
PREPARED BY	JS	
DESIGNED BY	JSI	
REVIEWED BY	JSI	
APPROVED BY	MNH	
PROJECT No.	153-1406	
PHASE	0003D	

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





- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - SCL4A - UWL Cell 4A Monitoring Well
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPB - Fly Ash Surface Impoundment Monitoring Well
  - SCPC - WFGD Surface Impoundment Monitoring Well
  - SPCA Pond Gauge
  - River Elevation
  - Utility Waste Landfill (UWL)**
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  - UWL Future Perimeter Fence
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  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
  - 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
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  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCL4A POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 7 - MARCH 8, 2017

**CONSULTANT**  
 Golder Associates

**DATE**  
 2017-03-14

**PREPARED** JSI  
**DESIGN** JSI  
**REVIEW** JS  
**APPROVED** MNH

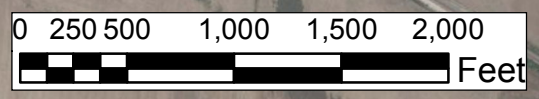
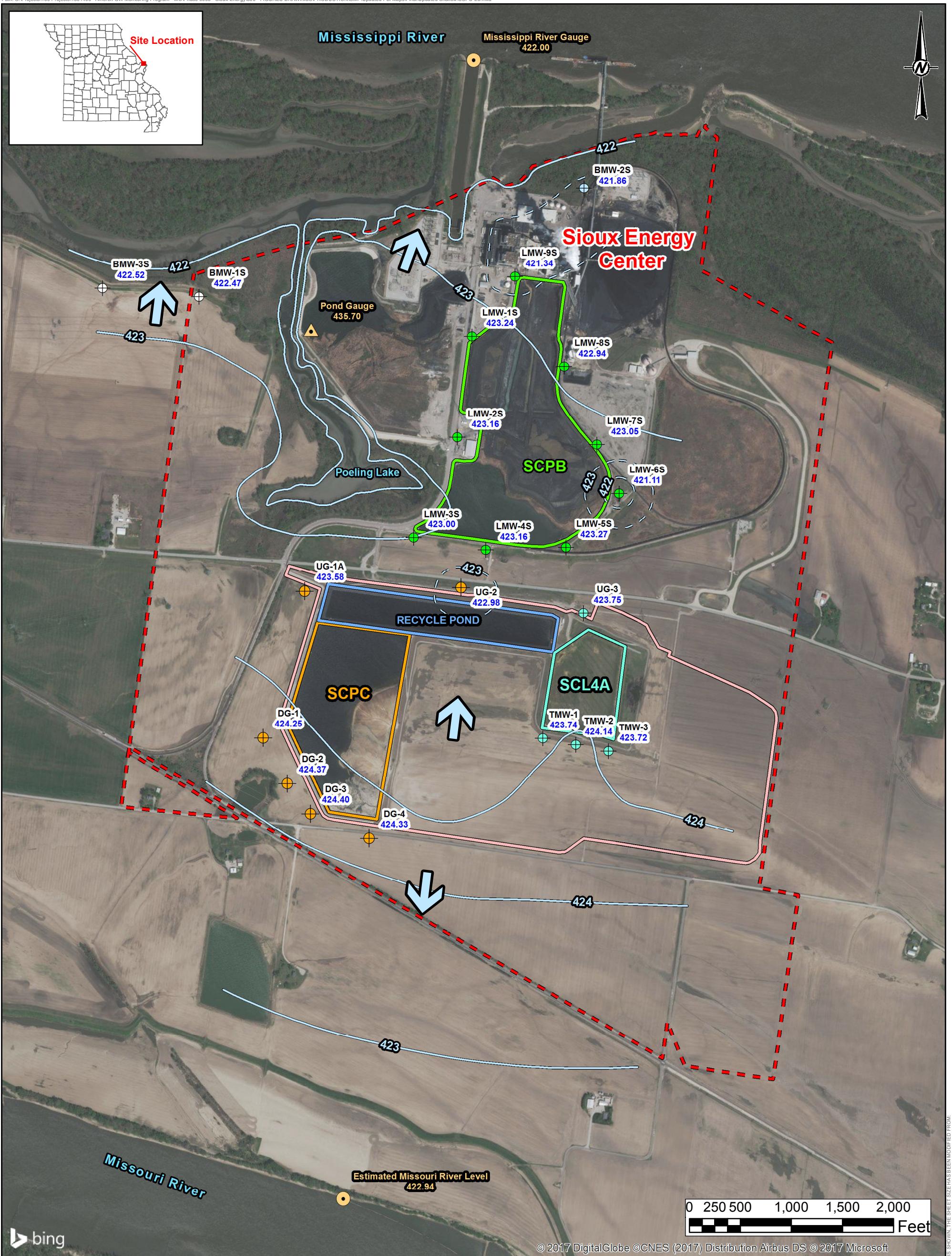
**PROJECT No.** 153-1406  
**PHASE** 0003D

**FIGURE** P7

0 250 500 1,000 1,500 2,000 Feet

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- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - SCL4A - UWL Cell 4A Monitoring Well
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
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  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCL4A POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 8 - JUNE 5, 2017

**CONSULTANT**  
 Golder Associates

**DATE**  
 2017-07-05

**PREPARED**  
 JSI

**DESIGN**  
 JSI

**REVIEW**  
 RJF

**APPROVED**  
 MNH

**PROJECT No.**  
 153-1406

**PHASE**  
 0003D

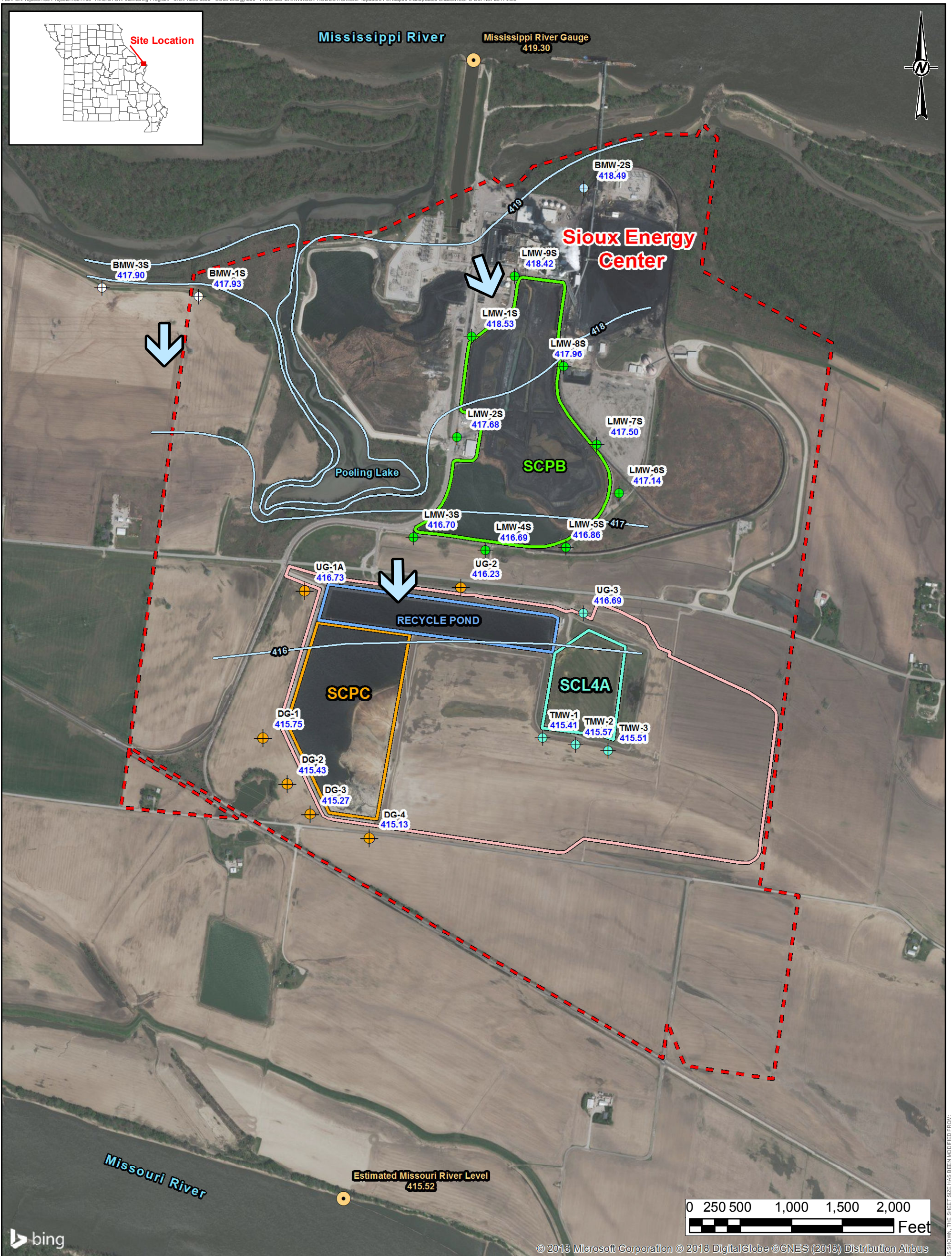
**FIGURE**  
 P8

**Ameren**

**Golder Associates**

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



- LEGEND**
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  - SCPB - Fly Ash Surface Impoundment
  - Ground/Surface Water Measurement Locations**
  - + SCL4A - UWL Cell 4A Monitoring Well
  - + Groundwater Elevation Piezometer
  - + Background Monitoring Well
  - + SCPB - Fly Ash Surface Impoundment Monitoring Well
  - + SCPC - WFGD Surface Impoundment Monitoring Well
  - + SPCA Pond Gauge
  - + River Elevation
  - Utility Waste Landfill (UWL)**
  - SCL4A - UWL Cell 4A
  - SCPC - WFGD Surface Impoundment
  - Water Recycle Pond
  - UWL Future Perimeter Fence
  - Groundwater Elevation Contours**
  - Groundwater Elevation Contour (FT MSL)
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  - 4.) AMEREN MISSOURI SIOUX POWER PLANT UTILITY WASTE LANDFILL PROPOSED CONSTRUCTION PERMIT MODIFICATION (#0918301), AUGUST 2014.

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCL4A POTENTIOMETRIC SURFACE MAP  
 DETECTION MONITORING - NOVEMBER 13, 2017

**CONSULTANT**  
 Golder Associates

**PROJECT No.**  
 153-1406

**PHASE**  
 0003D

CLIENT	AMEREN MISSOURI	AMEREN
PROJECT	SIOUX ENERGY CENTER	
TITLE	CCR GROUNDWATER MONITORING PROGRAM	
CONSULTANT	GOLDER ASSOCIATES	
DATE	2017-11-22	
PREPARED BY	RJF	
DESIGN BY	JSI	
REVIEW BY	JS	
APPROVED BY	MNH	
PROJECT No.	153-1406	
PHASE	0003D	
FIGURE	P9	

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

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Australasia	+ 61 3 8862 3500
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South America	+ 56 2 2616 2000

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**Golder Associates Inc.**  
**820 S. Main Street, Suite 100**  
**St. Charles, MO 63301 USA**  
**Tel: (636) 724-9191**  
**Fax: (636) 724-9323**



**Engineering Earth's Development, Preserving Earth's Integrity**

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