



REPORT

# 2017 ANNUAL GROUNDWATER MONITORING REPORT

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

A groundwater monitoring well network was designed and installed for the SCPA to meet the requirements of the CCR Rule. The well network consists of two background monitoring wells and six downgradient monitoring wells that were installed in December 2015 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 SCPA will continue Detection Monitoring on a semi-annual basis and, in accordance with the CCR Rule, statistical analysis of sample results will determine the need for Assessment Monitoring or any efforts related to Assessment of Corrective Measures or potential Corrective Action in the future. As of December 31, 2017, the SCPA 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 SCPA. The groundwater monitoring system consists of eight monitoring wells screened in the uppermost aquifer (alluvial aquifer). Monitoring wells were installed by Cascade Drilling LP using rotosonic drilling techniques under the direct supervision of a Golder Geologist or Engineer and 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 SCPA consist of BMW-1D and BMW-3D. 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 are BMW-1D and BMW-3D. These wells are located west of the SCPA and provide background groundwater quality for SCPA monitoring.

### 2.2 Downgradient Monitoring Well Locations

Downgradient monitoring wells are located around the SCPA to monitor downgradient water quality. **Figure 1** shows that the downgradient well network consists of six groundwater monitoring wells (UMW-1D, UMW-2D, UMW-3D, UMW-4D, UMW-5D, and UMW-6D) around the SCPA at locations that are located in 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 SCPA 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 SCPA was slightly toward the north or toward the Mississippi River. Horizontal gradients calculated by the program range 0.0001 to 0.0007 feet/foot throughout the intermediate/deep alluvial aquifer and from 0.0002 to 0.0006 feet/foot in the



compliance wells surrounding the SCPA with an estimated net annual groundwater velocity of approximately 13 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. Verification sampling, if needed, and 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-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D	
	Date of Sample Collection								
Baseline Event 1	3/16/2016	11/17/2016	3/17/2016	3/16/2016	3/16/2016	3/16/2016	3/16/2016	3/17/2016	Baseline
Baseline Event 2	5/9/2016	12/8/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016	Baseline
Baseline Event 3	7/5/2016	1/3/2017	7/5/2016	7/6/2016	7/6/2016	7/6/2016	7/7/2016	7/7/2016	Baseline
Baseline Event 4	9/14/2016	2/2/2017	9/15/2016	9/14/2016	9/14/2016	9/14/2016	9/16/2016	9/16/2016	Baseline
Baseline Event 5	11/7/2016	3/8/2017	11/8/2016	11/7/2016	11/7/2016	11/7/2016	11/7/2016	11/8/2016	Baseline
Baseline Event 6	1/3/2017	4/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017	Baseline
Baseline Event 7	3/8/2017	6/5/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/8/2017	3/8/2017	Baseline
Baseline Event 8	6/5/2017	6/26/2017	6/7/2017	6/7/2017	6/7/2017	6/7/2017	6/7/2017	6/6/2017	Baseline
November 2017 Detection Monitoring Event	11/13/2017	11/13/2017	11/14/2017	11/13/2017	11/13/2017	11/13/2017	11/13/2017	11/13/2017	Detection
Total Number of Samples Collected	9	9	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-3D was installed to replace BMW-2D in November 2016. BMW-2D was replaced due to concern that it was not providing groundwater samples that were representative of background water conditions at the SEC. The variable direction of overall groundwater movement at the SEC complicates the placement of background wells. The groundwater can flow north and south depending upon the levels of the Mississippi and Missouri Rivers. Therefore, BMW-2D is no longer used for groundwater monitoring (only for piezometric level measurement) and BMW-3D was installed as a second background well and located to the west of the CCR units at the SEC.



During Baseline Sampling Event 4, sample analysis for S-UMW-5D and S-UMW-6D were switched as the result of an error. Values were determined to be switched based on review of results and professional judgement. Consequently, testing data were matched with the correct wells and these updates are reflected in **Appendix B** and **Table 5**.

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 SCPA, the following wells were submerged by flood water: UMW-4D, BMW-1D, and BMW-3D. On May 19, 2017 Golder performed a post-flood monitoring well inspection at the SEC and found that none of the SCPA 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

Jeffrey Ingram, R.G.  
Project Geologist

JSI/RJF/MNH

# **TABLES**

**Table 1**  
**Monitoring Well Construction Details**  
**SCPA Surface Impoundment**  
**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>
UMW-1D	12/15/2015	1121321.4	879420.0	447.16	445.4	383.9	374.1	373.7	71.7
UMW-2D	12/17/2015	1120266.7	878981.6	433.86	431.7	386.6	376.8	376.4	55.4
UMW-3D	12/16/2015	1120570.4	878251.1	431.67	430.1	384.3	374.5	374.1	56.0
UMW-4D	12/16/2015	1121077.9	877859.9	423.52	421.7	380.7	370.9	370.5	51.2
UMW-5D	12/17/2015	1121815.0	877799.1	446.66	444.8	384.8	375.0	374.6	70.2
UMW-6D	12/18/2015	1122312.0	878639.5	447.02	444.9	384.1	374.3	373.9	71.0
BMW-1D	12/8/2015	1121713.6	876740.9	428.28	426.0	383.1	373.3	372.9	53.2
BMW-3D	11/8/2016	1121798.8	875798.3	426.41	424.2	381.8	372.0	371.6	52.6

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.

**Table 2**  
**Baseline Sampling Event 1 Results**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	3/16/2016	11/17/2016	3/17/2016	3/16/2016	3/16/2016	3/16/2016	3/16/2016	3/17/2016
DISSOLVED OXYGEN	mg/L	0.27	0.96	0.63	0.58	0.47	0.25	1.16	0.71
pH	SU	7.13	6.92	7.48	8.08	8.09	7.26	6.82	6.66
REDOX POTENTIAL	mV	-96.5	-131.5	-221.3	-231.4	-184.0	-199.9	-61.7	-72.8
SPECIFIC CONDUCTIVITY	mS/cm	0.618	0.704	0.635	1.115	1.368	1.089	0.826	0.685
TURBIDITY	NTU	4.15	0.86	0.67	1.76	4.12	2.62	4.25	4.56
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	193	50.7 J	254	15,100	30,200	31,200	10,800	647
CALCIUM, TOTAL	µg/L	126,000	104,000	78,400	200,000	293,000	191,000	98,400	79,300
CHLORIDE, TOTAL	mg/L	5.3	8.5	18.9	19.5	17.2	25.5	24.7	17.3
FLUORIDE, TOTAL	mg/L	0.30	0.28	0.34	1.1	0.81	0.75	0.58	0.29
SULFATE, TOTAL	mg/L	36.5	26.9	80.5	524	833	511	41.5	60.0
TOTAL DISSOLVED SOLIDS	mg/L	471	429	389	1,010	1,450	1,100	455	345
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	0.13 J	0.067 J	0.083 J	ND	ND	ND
ARSENIC, TOTAL	µg/L	0.20 J	0.24 J	0.90 J	0.87 J	0.82 J	0.70 J	0.80 J	0.31 J
BARIUM, TOTAL	µg/L	334	612	161	122	88.0	95.9	369	133
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	0.46 J	ND	0.35 J	0.56 J	0.40 J	0.42 J	0.37 J
COBALT, TOTAL	µg/L	0.73 J	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	3.9 J	4.2 J	3.6 J	4.8 J	ND
LITHIUM, TOTAL	µg/L	14.2	14.2	13.1	24.6	14.7	37.9	31.4	12.6
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	1.3 J	ND	31.7	1,310	4,800	8,300	264	95.9
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND	1.283	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	0.20 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	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**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	5/9/2016	12/8/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016	5/10/2016
DISSOLVED OXYGEN	mg/L	1.30	0.09	0.70	1.27	1.32	1.31	0.88	1.09
pH	SU	6.24	7.21	7.35	7.34	7.06	6.68	7.24	7.10
REDOX POTENTIAL	mV	-24.6	-116.1	-74.1	-70.1	-76.3	-53.4	-96.3	-65.0
SPECIFIC CONDUCTIVITY	mS/cm	1.037	0.715	0.625	1.789	1.972	1.698	0.853	0.688
TURBIDITY	NTU	1.99	1.13	2.66	2.60	4.08	4.72	3.43	9.01
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	182	53.1 J	614	18,800	26,100	26,300	11,800	680
CALCIUM, TOTAL	µg/L	132,000	103,000	62,700	226,000	256,000	177,000	97,000	82,800
CHLORIDE, TOTAL	mg/L	5.5	10.8	20.0	21.2	23.5	25.5	7.3	18.6
FLUORIDE, TOTAL	mg/L	0.35	0.34	0.31	1.3	1.1	0.89	0.65	0.37
SULFATE, TOTAL	mg/L	39.9	36.8	61.1	641	663	397	26.1	66.2
TOTAL DISSOLVED SOLIDS	mg/L	465	425	321	1,110	1,210	1,000	453	377
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	0.076 J	0.11 J	0.077 J	0.21 J	ND	ND	ND
ARSENIC, TOTAL	µg/L	ND	ND	0.90 J	1.1	0.85 J	0.60 J	0.88 J	0.20 J
BARIUM, TOTAL	µg/L	314	667	120	121	75.6	78.4	333	129
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.58 J	0.99 J	0.62 J	0.66 J	0.62 J	0.48 J	0.56 J	ND
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	3.7 J	ND	3.0 J	ND	ND	ND	2.5 J	2.9 J
LITHIUM, TOTAL	µg/L	16.8	20.6	14.6	29.7	27.2	39.6	32.5	14.4
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	0.53 J	1.8 J	38.3	1,440	4,250	7,220	271	106
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND	1.535	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.23 J	0.21 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	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**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	7/5/2016	1/3/2017	7/5/2016	7/6/2016	7/6/2016	7/6/2016	7/7/2016	7/7/2016
DISSOLVED OXYGEN	mg/L	1.67	0.39	1.20	1.21	0.41	0.95	1.65	1.52
pH	SU	7.17	7.52	7.65	8.23	8.05	7.21	7.42	7.10
REDOX POTENTIAL	mV	-66.3	-111.7	-108.2	-121.2	-121.2	-75.1	-116.3	-82.1
SPECIFIC CONDUCTIVITY	mS/cm	0.839	0.724	0.620	1.252	1.303	1.258	0.739	0.594
TURBIDITY	NTU	4.00	2.54	1.55	3.35	2.93	3.64	4.09	9.30
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	236	76.2 J	810	16,800	24,000	26,500	12,900	760
CALCIUM, TOTAL	µg/L	121,000	141,000	68,600	209,000	219,000	178,000	94,600	76,500
CHLORIDE, TOTAL	mg/L	5.8	11.2	21.2	19.9	24.6	25.5	24.7	21.7
FLUORIDE, TOTAL	mg/L	0.26	0.34	0.22	1.1	1.0	0.86	0.66	0.34
SULFATE, TOTAL	mg/L	41.1	28.8	65.1	594	565	522	40.4	77.8
TOTAL DISSOLVED SOLIDS	mg/L	475	445	376	1,090	1,150	1,100	461	364
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	0.078 J	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	0.17 J	1.5	1.1	1.4	0.44 J	0.27 J	0.65 J	0.32 J
BARIUM, TOTAL	µg/L	261	183	138	119	70.1	83.4	312	118
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.35 J	0.59 J	ND	ND	ND	ND	0.46 J	0.67 J
COBALT, TOTAL	µg/L	ND	2.8 J	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	2.7 J	ND	3.0 J	ND
LITHIUM, TOTAL	µg/L	12.8	7.9 J	13.7	28.7	26.0	37.9	29.8	12.1
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	6.2 J	40.3	1,360	3,770	7,550	280	109
RADIUM [226 + 228]	pCi/L	ND	ND	ND	1.706	ND	1.396	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.30 J	ND	0.22 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	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**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	9/14/2016	2/2/2017	9/15/2016	9/14/2016	9/14/2016	9/14/2016	9/16/2016	9/16/2016
DISSOLVED OXYGEN	mg/L	1.89	0.74	0.77	1.81	1.25	0.31	0.83	0.82
pH	SU	7.36	6.12	7.02	7.90	7.98	7.30	7.10	7.01
REDOX POTENTIAL	mV	-105.6	-12.2	37.2	-137.4	-156.1	-20.4	12.5	-93.1
SPECIFIC CONDUCTIVITY	mS/cm	0.735	0.541	0.932	1.091	1.147	1.193	0.755	0.620
TURBIDITY	NTU	1.25	2.90	2.48	1.79	1.28	0.91	4.53	8.80
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	240	ND	318	14,700	25,200	24,100	11,400	802
CALCIUM, TOTAL	µg/L	123,000	106,000	99,000	192,000	220,000	176,000	90,400	74,100
CHLORIDE, TOTAL	mg/L	5.9	8.2	23.2	19.7	22.4	24.7	25.5	20.8
FLUORIDE, TOTAL	mg/L	0.32	0.34	0.19 J	1.0	1.0	0.84	0.63	0.44
SULFATE, TOTAL	mg/L	41.6	20.0	213	528	684	624	38.6	80.2
TOTAL DISSOLVED SOLIDS	mg/L	506	402	588	1,010	1,170	1,110	436	347
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	0.066 J	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	ND	ND	0.98 J	1.3	0.29 J	0.20 J	0.51 J	0.34 J
BARIUM, TOTAL	µg/L	309	650	195	105	71.8	81.2	300	117
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	0.25 J	0.45 J	ND	ND
CHROMIUM, TOTAL	µg/L	0.41 J	0.61 J	0.36 J	ND	ND	ND	0.64 J	ND
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	3.1 J	6.3	ND	ND
LITHIUM, TOTAL	µg/L	12.9	20.0	14.2	28.0	18.4	38.0	31.0	12.0
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	27.9	1,270	4,280	7,200	259	112
RADIUM [226 + 228]	pCi/L	ND	1.933	ND	ND	2.298	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.30 J	0.27 J	0.20 J	ND
THALLIUM, TOTAL	µg/L	ND	0.082 J	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 - millisiemen 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.
5. Due to laboratory error, BMW-1D was resampled for chloride, fluoride, and sulfate on October 20, 2016.



**Table 6**  
**Baseline Sampling Event 5 Results**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	11/7/2016	3/8/2017	11/8/2016	11/7/2016	11/7/2016	11/7/2016	11/7/2016	11/8/2016
DISSOLVED OXYGEN	mg/L	1.06	0.55	0.48	0.47	1.15	0.29	0.35	0.40
pH	SU	7.05	7.02	7.47	8.00	8.00	7.15	7.28	7.05
REDOX POTENTIAL	mV	-118.3	64.2	-169.4	-184.4	-177.8	-138.0	-152.1	-112.2
SPECIFIC CONDUCTIVITY	mS/cm	0.898	0.660	0.922	1.205	1.423	1.474	0.793	0.626
TURBIDITY	NTU	1.03	1.61	1.92	1.36	0.89	1.42	3.29	4.70
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	174	69.4 J	454	10,600	26,400	24,600	12,400	902
CALCIUM, TOTAL	µg/L	129,000	120,000	110,000	177,000	230,000	186,000	94,000	77,600
CHLORIDE, TOTAL	mg/L	5.6	8.2	27.9	19.8	21.0	24.1	24.1	19.9
FLUORIDE, TOTAL	mg/L	0.29	0.26	0.25	1.0	0.95	0.78	0.70	0.40
SULFATE, TOTAL	mg/L	37.7	21.9	194	444	810	600	48.7	79.2
TOTAL DISSOLVED SOLIDS	mg/L	469	424	551	823	1,120	1,020	455	352
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	0.15 J	0.086 J	1.0	1.5	0.41 J	0.18 J	0.62 J	0.38 J
BARIUM, TOTAL	µg/L	308	699	184	85.8	70.9	72.0	296	116
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	0.12 J	0.13 J	ND	ND
CHROMIUM, TOTAL	µg/L	0.35 J	0.70 J	ND	0.55 J	ND	0.34 J	0.44 J	0.37 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	3.5 J	5.6	ND	ND
LITHIUM, TOTAL	µg/L	14.8	21.5	15.5	31.1	16.2 J	41.3	32.5	13.6
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	27.9	989	4,230	7,190	253	114
RADIUM [226 + 228]	pCi/L	1.522	ND	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.27 J	0.22 J	0.29 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	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 7**  
**Baseline Sampling Event 6 Results**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	1/3/2017	4/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017	1/5/2017
DISSOLVED OXYGEN	mg/L	0.49	0.50	0.50	0.21	0.43	0.54	0.31	0.24
pH	SU	7.49	6.44	7.47	8.03	8.55	7.57	7.32	7.03
REDOX POTENTIAL	mV	-114.5	109.7	-118.3	-170.1	-105.2	3.6	-120.2	-124.7
SPECIFIC CONDUCTIVITY	mS/cm	0.814	0.712	0.649	1.229	1.313	1.424	0.607	0.586
TURBIDITY	NTU	0.99	1.81	1.60	1.69	0.52	0.58	4.23	4.68
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	170	58.2 J	538	14,500	21,300	28,600	5,970	899
CALCIUM, TOTAL	µg/L	135,000	105,000	81,300	188,000	206,000	204,000	75,800	74,900
CHLORIDE, TOTAL	mg/L	5.6	8.5	23.2	20.0	23.2	25.9	24.4	20.1
FLUORIDE, TOTAL	mg/L	0.27	0.31	0.27	1.1	1.0	0.86	0.56	0.38
SULFATE, TOTAL	mg/L	38.8	24.6	85.6	477	531	550	15.5	80.2
TOTAL DISSOLVED SOLIDS	mg/L	460	414	374	885	1,020	1,120	350	349
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	0.041 J	ND	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	ND	ND	0.98 J	1.4	0.14 J	ND	0.26 J	0.20 J
BARIUM, TOTAL	µg/L	334	684	146	92.8	76.1	90.4	281	119
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	0.23 J	0.79	1.9	0.041 J	0.031 J
CHROMIUM, TOTAL	µg/L	0.42 J	ND	0.71 J	ND	0.35 J	ND	ND	0.70 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	4.7 J	ND	ND
LITHIUM, TOTAL	µg/L	15.1	23.6	13.5	29.7	18.4	44.2	28.4	12.2
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	0.75 J	ND	40.9	1,310	3,430	7,830	254	110
RADIUM [226 + 228]	pCi/L	ND	1.761	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	0.10 J	ND	ND	0.21 J	0.24 J	ND	ND
THALLIUM, TOTAL	µg/L	ND	ND	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**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	3/8/2017	6/5/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/8/2017	3/8/2017
DISSOLVED OXYGEN	mg/L	0.40	0.38	0.55	0.27	0.39	0.43	0.25	0.31
pH	SU	7.46	7.12	7.43	7.81	8.00	7.12	7.09	6.70
REDOX POTENTIAL	mV	-33.6	-73.2	24.3	-86.5	-59.6	64.8	23.2	24.9
SPECIFIC CONDUCTIVITY	mS/cm	0.741	0.714	0.564	1.714	1.393	1.336	0.524	0.515
TURBIDITY	NTU	0.92	2.83	0.89	0.92	0.47	0.34	3.54	3.43
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	185	42.4 J	325	25,200	25,000	23,000	2,990	935
CALCIUM, TOTAL	µg/L	146,000	97,100	71,600	302,000	236,000	181,000	71,500	79,000
CHLORIDE, TOTAL	mg/L	5.0	8.1	18.8	18.9	21.6	24.1	26.0	19.5
FLUORIDE, TOTAL	mg/L	0.25	0.27	0.34	0.72	0.99	0.63	0.47	0.36
SULFATE, TOTAL	mg/L	34.4	26.1	51.0	738	603	484	16.8	74.9
TOTAL DISSOLVED SOLIDS	mg/L	483	407	314	1,380	1,090	1,010	331	346
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	0.041 J	0.048 J	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	ND	ND	1.1	2.1	ND	ND	ND	ND
BARIUM, TOTAL	µg/L	376	665	123	131	79.8	71.2	248	115
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	ND	0.17 J	1.5	1.7 J	ND	ND	ND	ND
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	2.8 J	ND	ND	ND
LITHIUM, TOTAL	µg/L	13.7	ND	10.1	30.2	14.9	34.4	21.5	11.8
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	35.7	1,880	4,120	6,480	242	108
RADIUM [226 + 228]	pCi/L	ND	1.972	ND	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	ND	0.12 J	0.12 J	0.20 J	0.091 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	0.17 J	0.25 J	0.084 J	0.046 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 9**  
**Baseline Sampling Event 8 Results**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	6/5/2017	6/26/2017	6/7/2017	6/7/2017	6/7/2017	6/7/2017	6/7/2017	6/6/2017
DISSOLVED OXYGEN	mg/L	1.56	13.80	0.79	0.13	0.15	0.29	1.02	1.69
pH	SU	7.02	6.62	7.41	7.83	7.67	6.92	6.52	6.67
REDOX POTENTIAL	mV	-46.5	56.8	-56.8	-17.6	-100.8	-10.9	7.1	-39.3
SPECIFIC CONDUCTIVITY	mS/cm	0.831	0.723	0.490	1.468	1.469	1.314	0.590	0.528
TURBIDITY	NTU	4.17	2.85	1.16	1.74	0.99	0.83	3.81	5.66
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	179	55.2 J	278 J	24,200	24,200	21,600	7,240	781
CALCIUM, TOTAL	µg/L	118,000	102,000	53,500	244,000	231,000	174,000	82,900	69,600
CHLORIDE, TOTAL	mg/L	5.6	7.8	17.0	19.1	21.5	26.6	27.6	19.5
FLUORIDE, TOTAL	mg/L	0.24	0.29	0.34	0.78	0.94	0.70	0.53	0.37
SULFATE, TOTAL	mg/L	36.1	26.4	36.6	784	664	439	40.0	31.8
TOTAL DISSOLVED SOLIDS	mg/L	475	408	268	1,220	1,130	947	384	353
<b>APPENDIX IV</b>									
ANTIMONY, TOTAL	µg/L	ND	ND	ND	0.044 J	0.030 J	0.043 J	ND	ND
ARSENIC, TOTAL	µg/L	0.16 J	ND	0.98 J	1.9	0.23 J	ND	0.41 J	0.14 J
BARIUM, TOTAL	µg/L	332	668	109	96.8	70.5	67.5	284	112
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	0.24 J	0.53	0.91	0.028 J	0.030 J
CHROMIUM, TOTAL	µg/L	0.16 J	ND	0.22 J	0.12 J	0.67 J	0.13 J	ND	0.10 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	3.0 J	ND	3.4 J	ND	ND
LITHIUM, TOTAL	µg/L	ND	25.3	10.7 J	18.6	16.7	31.9	24.7	13.2
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	36.4	2,170	3,920	6,120	270	115
RADIUM [226 + 228]	pCi/L	ND	2.537	ND	ND	1.151	ND	1.192	1.244
SELENIUM, TOTAL	µg/L	ND	ND	ND	ND	0.17 J	0.12 J	0.11 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	0.10 J	0.052 J	0.083 J	0.038 J	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.

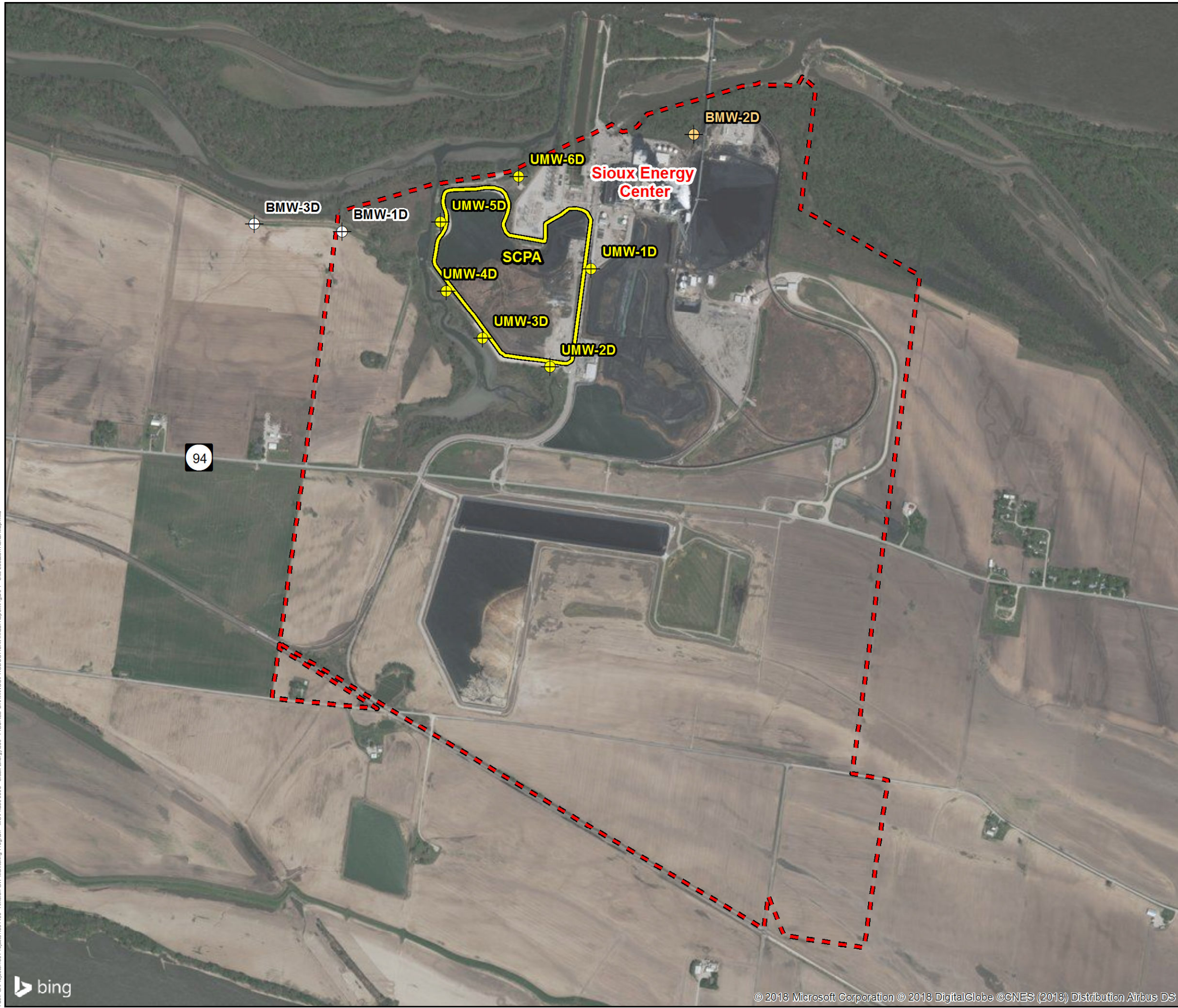
**Table 10**  
**November 2017 Detection Monitoring Results**  
**SCPA Surface Impoundment**  
**Sioux Energy Center, St. Charles County, MO**

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS					
		BMW-1D	BMW-3D	UMW-1D	UMW-2D	UMW-3D	UMW-4D	UMW-5D	UMW-6D
<b>FIELD PARAMETERS</b>									
DATE	NA	11/13/2017	11/13/2017	11/14/2017	11/13/2017	11/13/2017	11/13/2017	11/13/2017	11/13/2017
DISSOLVED OXYGEN	mg/L	0.30	0.28	1.07	0.69	1.25	1.06	5.08	0.60
pH	SU	7.20	7.15	7.66	8.05	7.76	6.89	7.38	7.14
REDOX POTENTIAL	mV	-128.5	-124.6	-100.4	-101.0	-69.3	0.4	-125.9	-113.9
SPECIFIC CONDUCTIVITY	mS/cm	0.800	0.709	0.573	1.371	1.414	1.343	0.552	0.599
TURBIDITY	NTU	2.02	1.69	1.52	3.33	3.75	4.45	1.64	4.68
<b>APPENDIX III</b>									
BORON, TOTAL	µg/L	ND	ND	266	22,100	24,100	27,000	3,450	1,130
CALCIUM, TOTAL	µg/L	131,000	110,000	71,200	224,000	237,000	192,000	70,000	81,400
CHLORIDE, TOTAL	mg/L	5.2	8.7	18.7	19.3	20.4	25.4	25.8	18.2
FLUORIDE, TOTAL	mg/L	0.28	0.29	0.41	0.70	1.0	0.80	0.55	0.43
SULFATE, TOTAL	mg/L	37.6	27.5	49.1	722	710	544	18.3	86.4
TOTAL DISSOLVED SOLIDS	mg/L	450	409	318	1,000	1,150	1,010	310	353

**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.

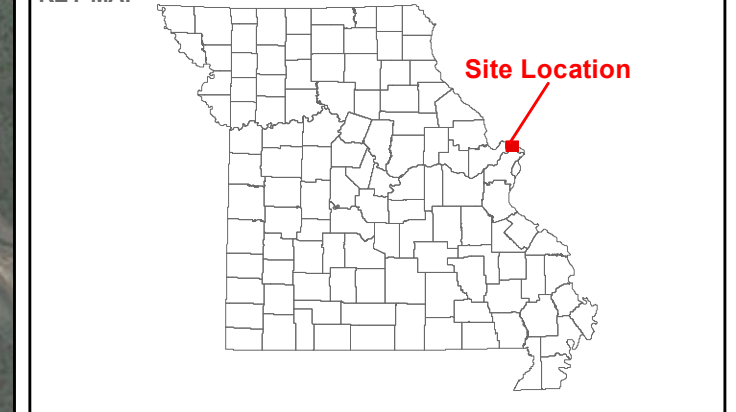
# FIGURES



**LEGEND**

- SCPA - Bottom Ash Surface Impoundment
- Sioux Energy Center Property Boundary
- Sampling Locations**
- Background Monitoring Well
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- SCPA Bottom Ash Surface Impoundment Piezometer Location

**KEY MAP**

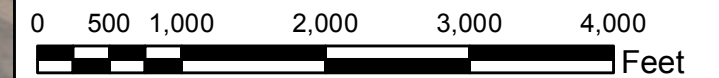


**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.

**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.



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

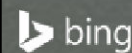


PROJECT No.  
153-1406

PHASE  
0003

FIGURE  
**1**

Path: G:\Projects\153-1406 - Ameren GW Monitoring Program - 150Phase0003 - Sioux Energy\800 - FIGURES\DRAWINGS\SPRODUCTION\Manual Report\Figure 1 - Site Location Aerial Map.mxd



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

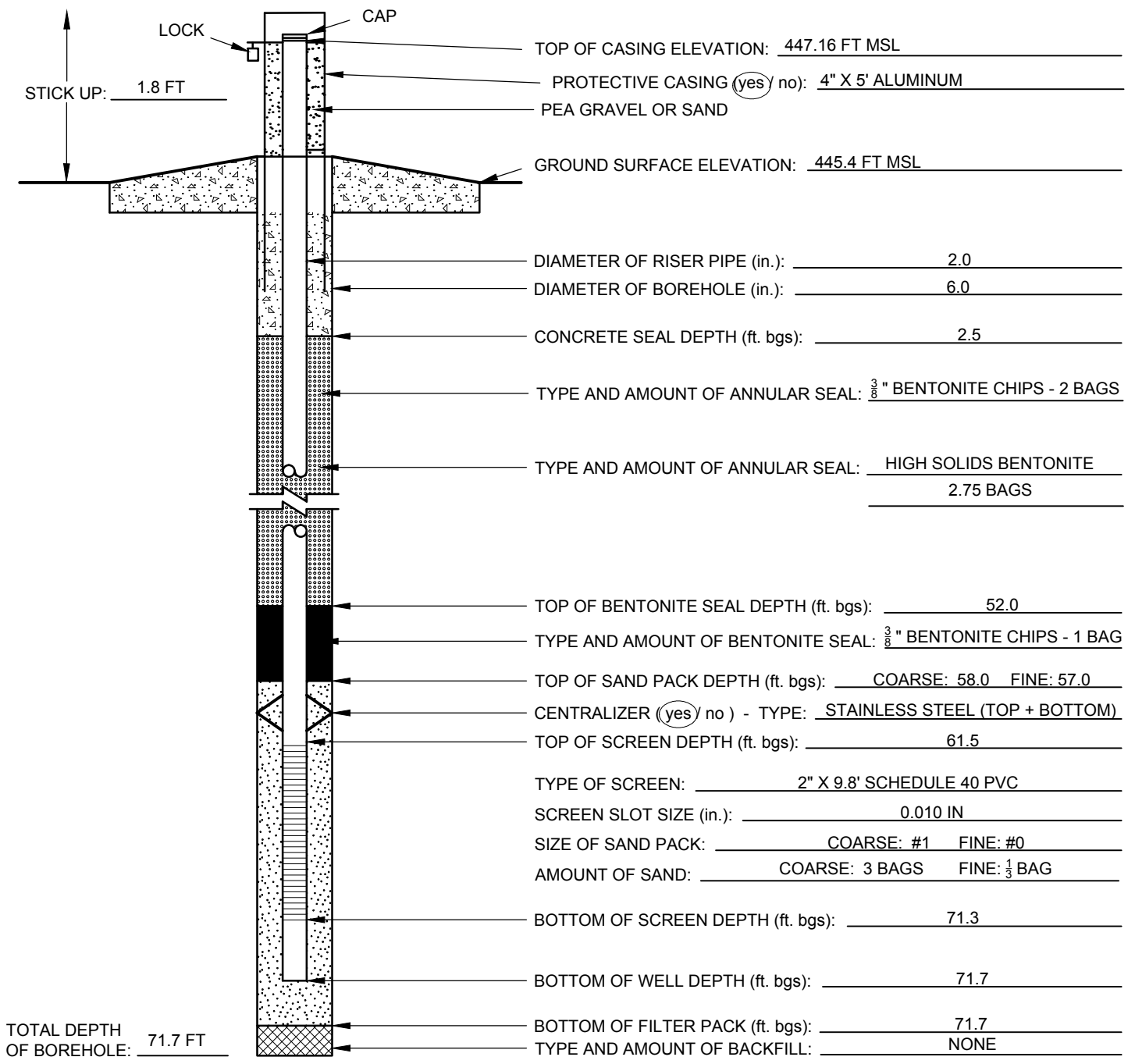
# **APPENDIX A – CCR MONITORING WELL CONSTRUCTION DIAGRAMS**





# ABOVE GROUND MONITORING WELL CONSTRUCTION LOG UMW-1D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-1D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 445.4 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1121321.4	EASTING: 879420.0	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 26.88 FT BTOC	COMPLETION DATE: 12/15/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



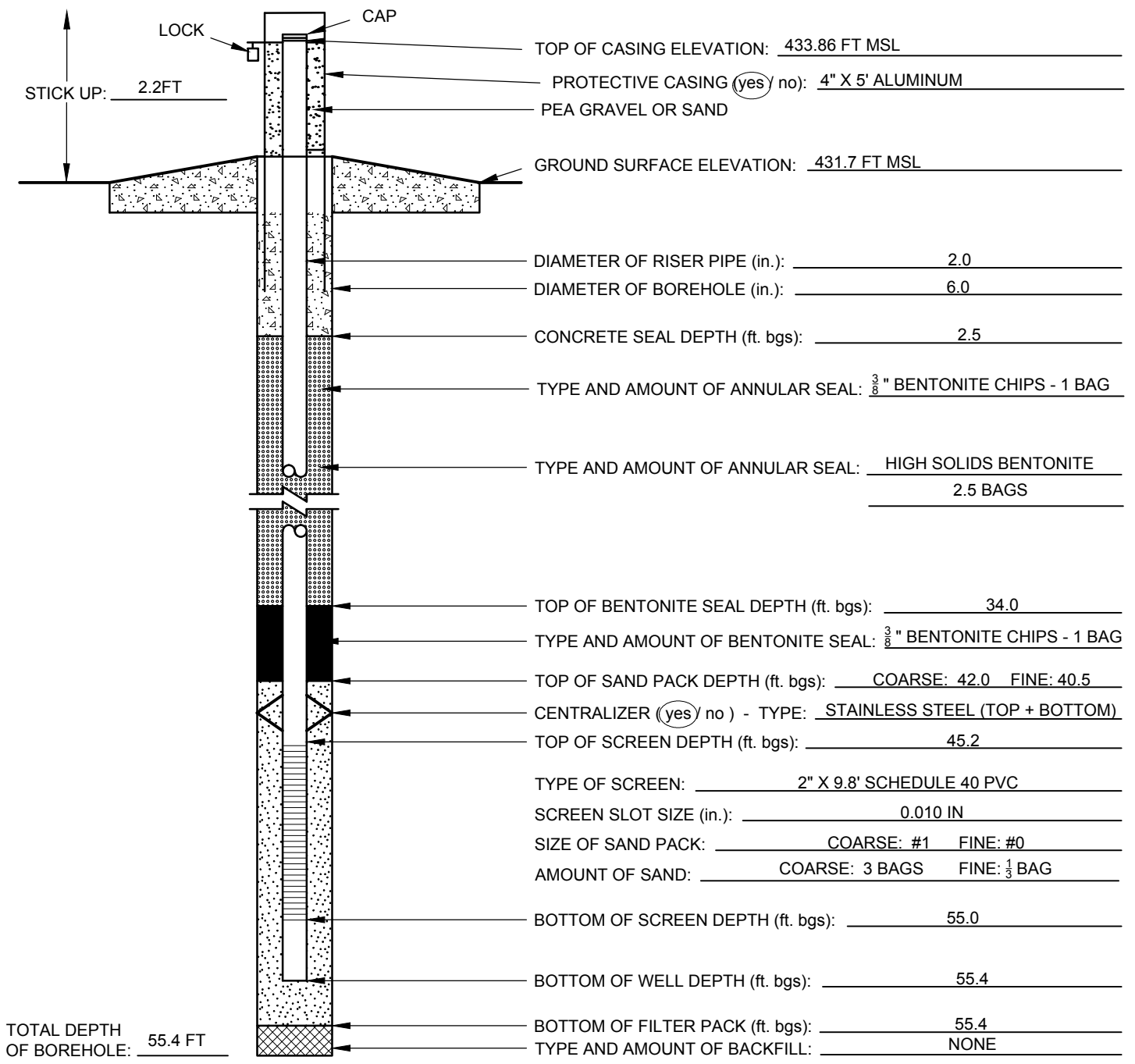
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 150 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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 UMW-2D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-2D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 431.7 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1120266.7	EASTING: 878981.6	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 10.65 FT BTOC	COMPLETION DATE: 12/17/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



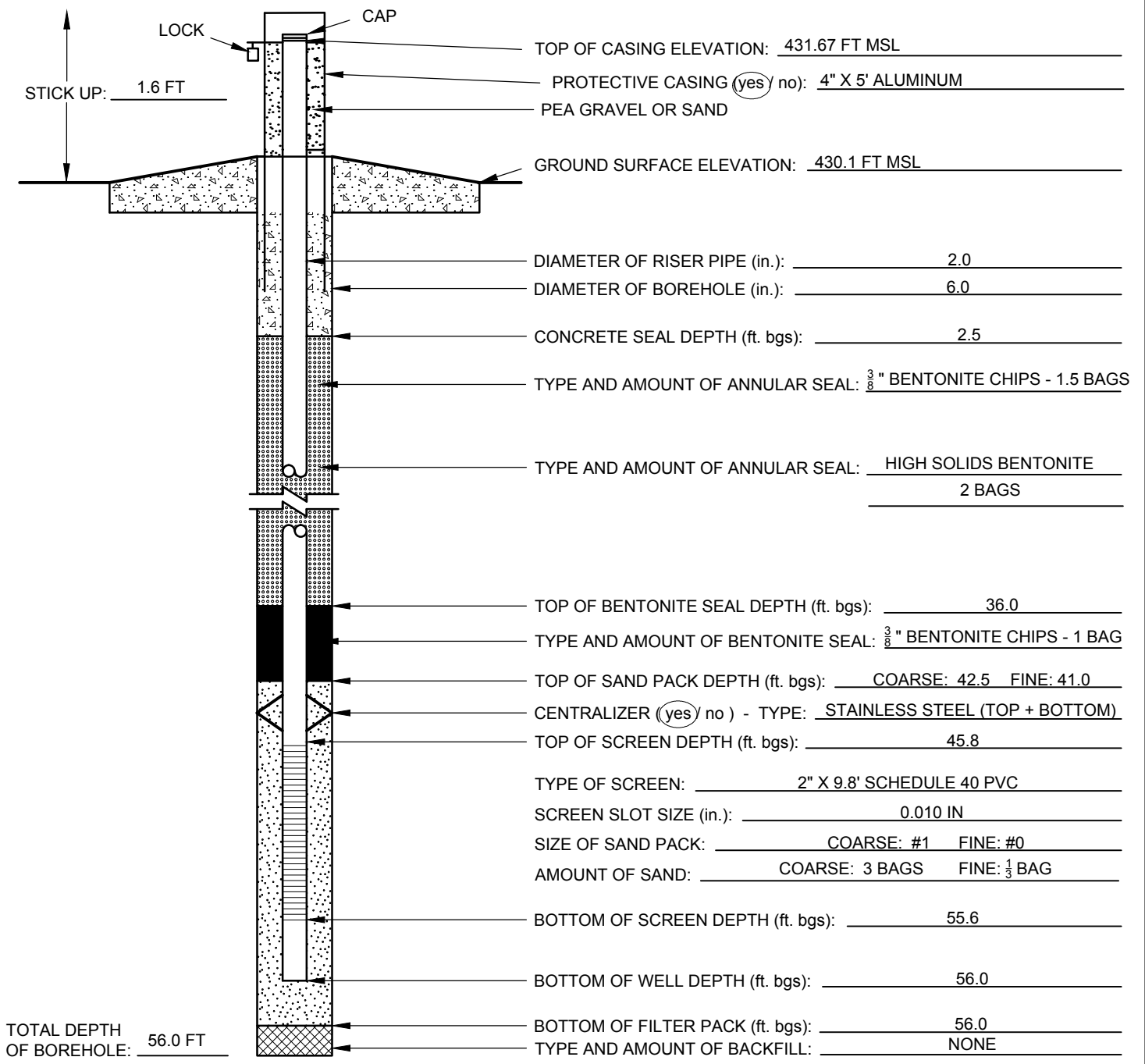
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 200 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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 UMW-3D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-3D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 430.1 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1120570.4	EASTING: 878251.1	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 10.57 FT BTOC	COMPLETION DATE: 12/16/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



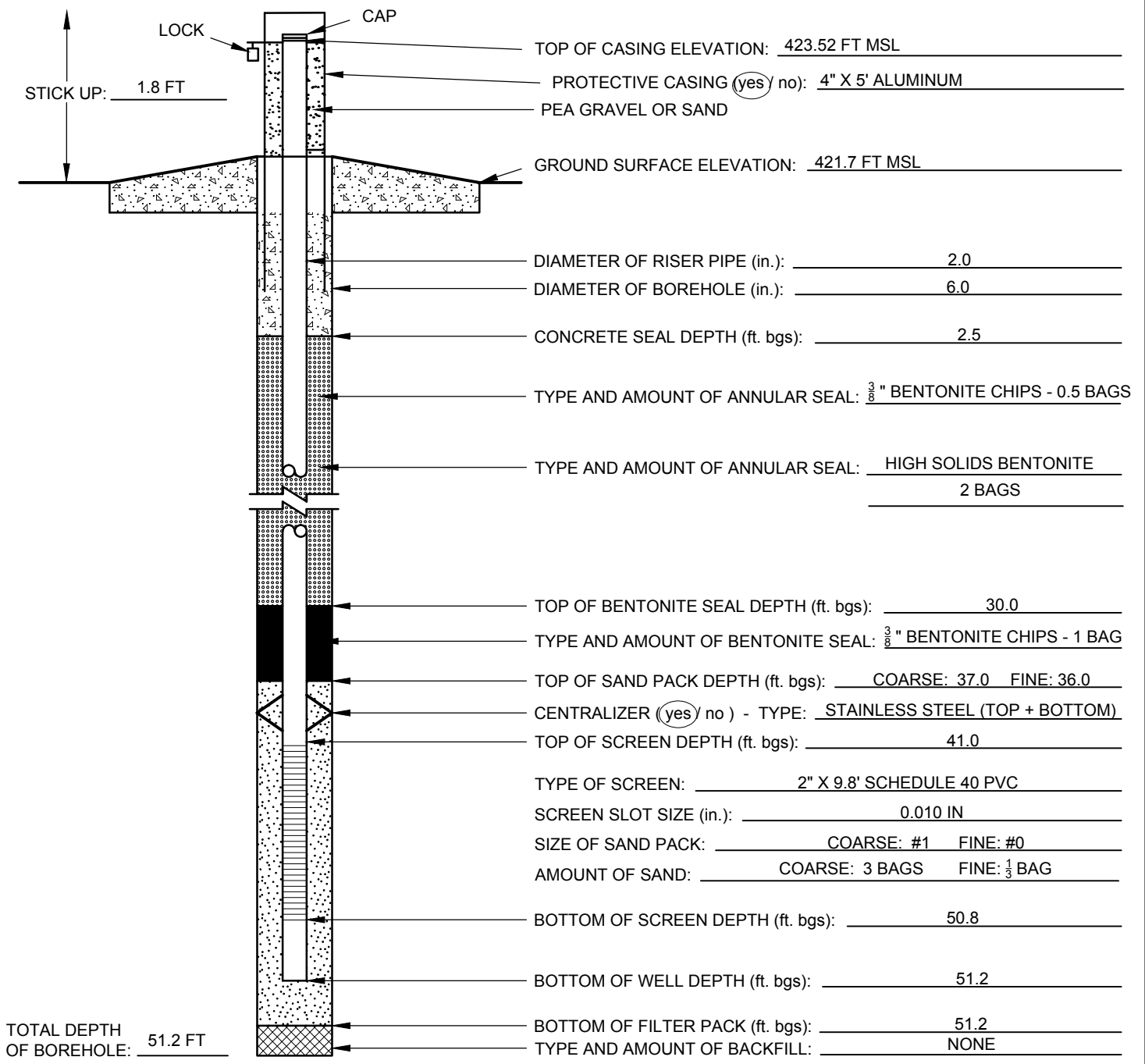
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 125 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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 UMW-4D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-4D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 421.7 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1121077.9	EASTING: 877859.9	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 2.95 FT BTOC	COMPLETION DATE: 12/16/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



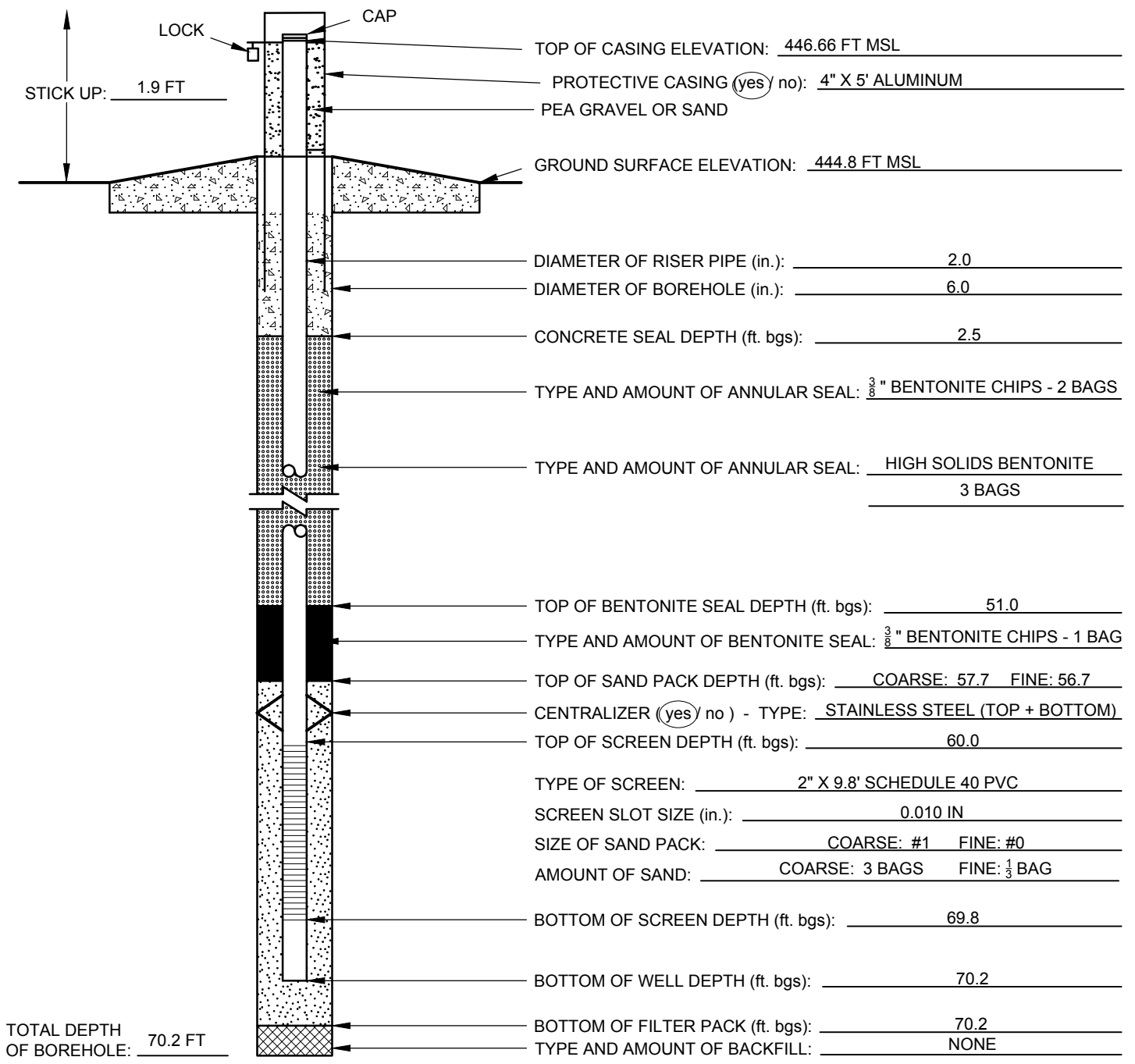
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 150 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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 UMW-5D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-5D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 444.8 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1121815.0	EASTING: 877799.1	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 26.01 FT BTOC	COMPLETION DATE: 12/17/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



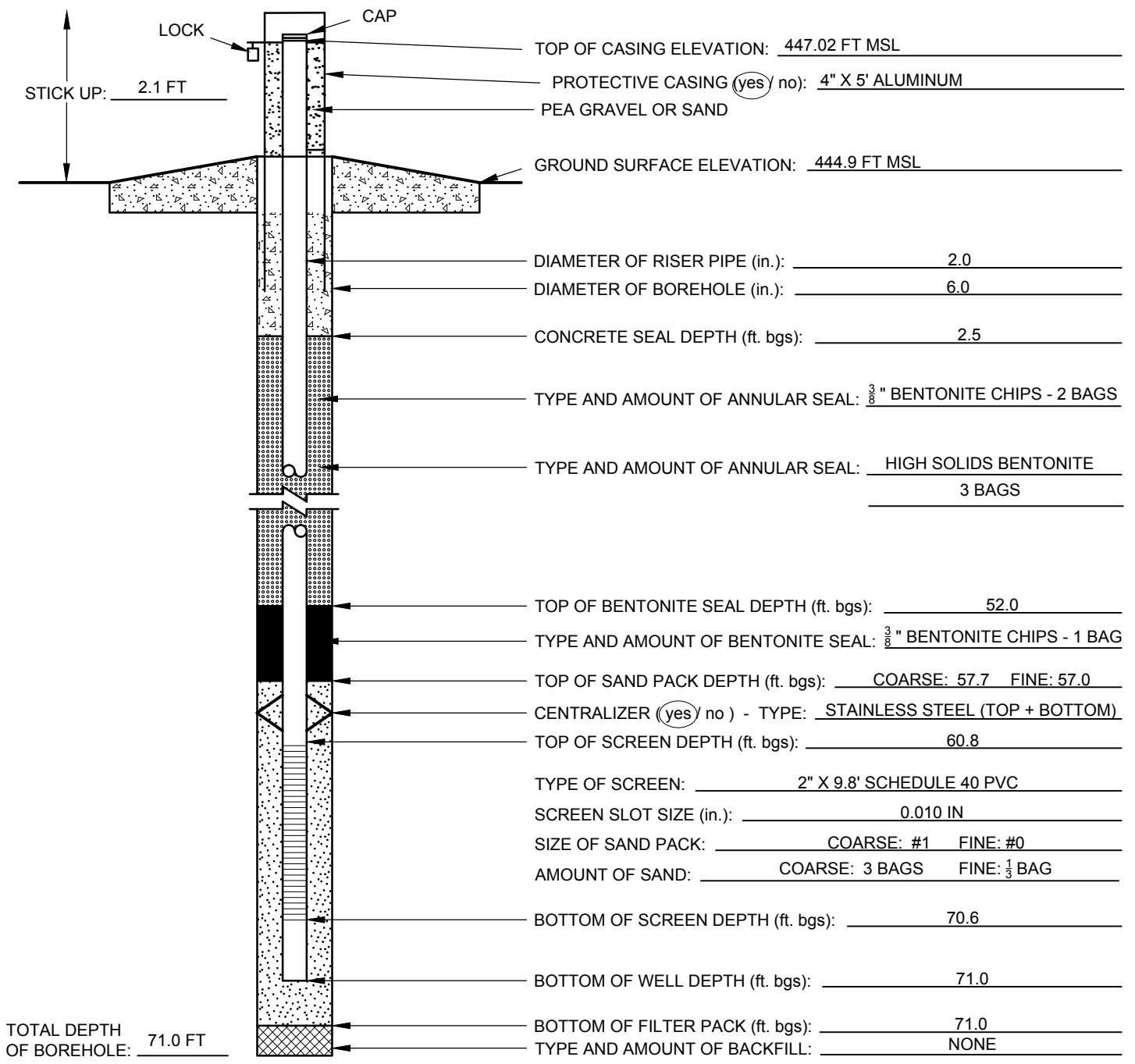
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 175 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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 UMW-6D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: UMW-6D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 444.9 FT MSL	
GEOLOGIST: J. SUOZZI	NORTHING: 1122312.0	EASTING: 878639.5	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 26.55 FT BTOC	COMPLETION DATE: 12/18/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



TOP OF CASING ELEVATION: 447.02 FT MSL  
 PROTECTIVE CASING (yes) no: 4" X 5' ALUMINUM  
 PEA GRAVEL OR SAND  
 GROUND SURFACE ELEVATION: 444.9 FT MSL  
 DIAMETER OF RISER PIPE (in.): 2.0  
 DIAMETER OF BOREHOLE (in.): 6.0  
 CONCRETE SEAL DEPTH (ft. bgs): 2.5  
 TYPE AND AMOUNT OF ANNULAR SEAL: 3/8" BENTONITE CHIPS - 2 BAGS  
 TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE 3 BAGS  
 TOP OF BENTONITE SEAL DEPTH (ft. bgs): 52.0  
 TYPE AND AMOUNT OF BENTONITE SEAL: 3/8" BENTONITE CHIPS - 1 BAG  
 TOP OF SAND PACK DEPTH (ft. bgs): COARSE: 57.7 FINE: 57.0  
 CENTRALIZER (yes) no - TYPE: STAINLESS STEEL (TOP + BOTTOM)  
 TOP OF SCREEN DEPTH (ft. bgs): 60.8  
 TYPE OF SCREEN: 2" X 9.8' SCHEDULE 40 PVC  
 SCREEN SLOT SIZE (in.): 0.010 IN  
 SIZE OF SAND PACK: COARSE: #1 FINE: #0  
 AMOUNT OF SAND: COARSE: 3 BAGS FINE: 1/3 BAG  
 BOTTOM OF SCREEN DEPTH (ft. bgs): 70.6  
 BOTTOM OF WELL DEPTH (ft. bgs): 71.0  
 BOTTOM OF FILTER PACK (ft. bgs): 71.0  
 TYPE AND AMOUNT OF BACKFILL: NONE

TOTAL DEPTH OF BOREHOLE: 71.0 FT

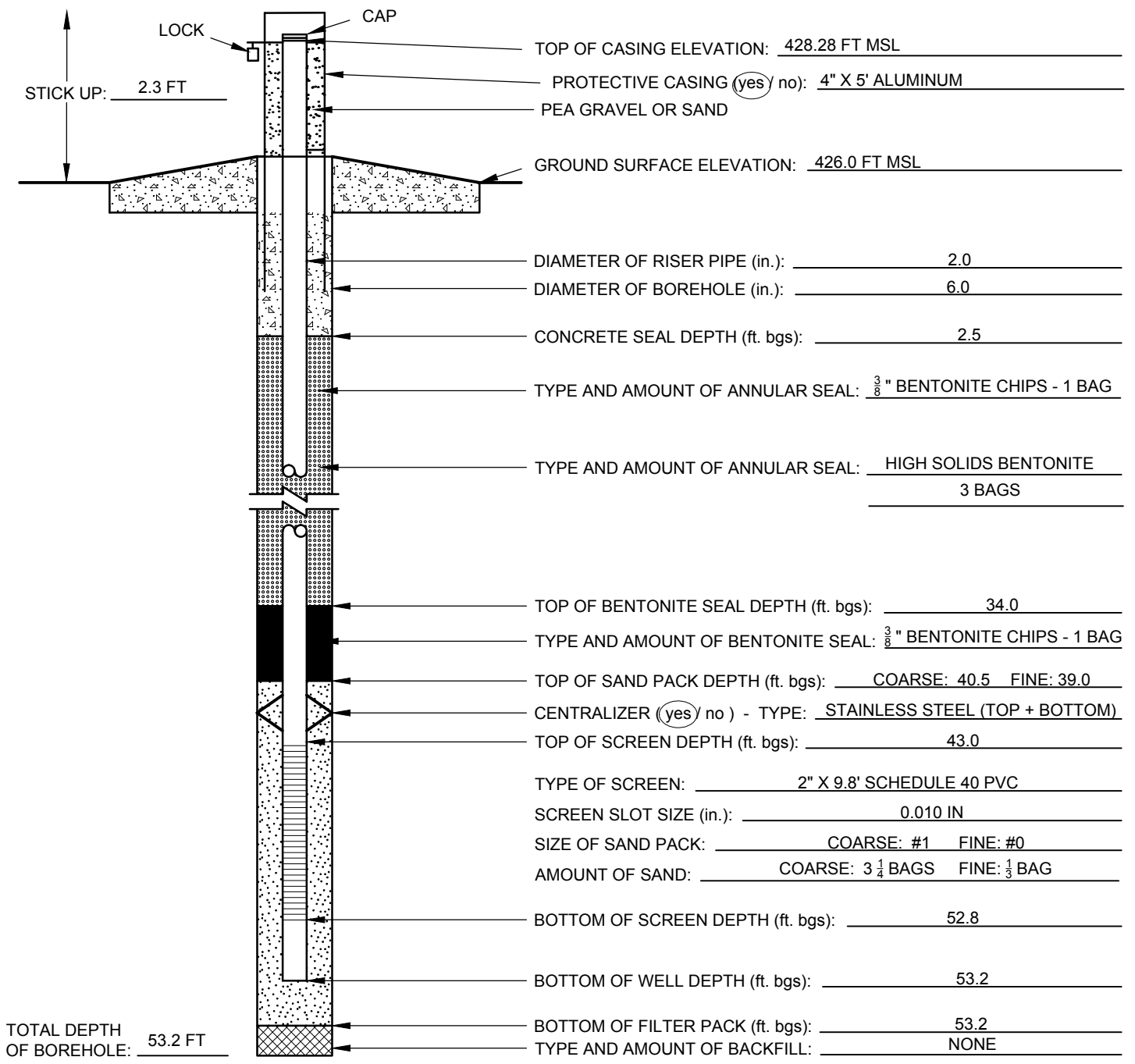
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
150 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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-1D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: BMW-1D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 426.0 FT MSL	
GEOLOGIST: J. INGRAM	NORTHING: 1121713.6	EASTING: 876740.9	
DRILLER: J. DRABEK	STATIC WATER LEVEL: 8.70 FT BTOC	COMPLETION DATE: 12/8/2015	
DRILLING COMPANY: CASCADE		DRILLING METHODS: SONIC	



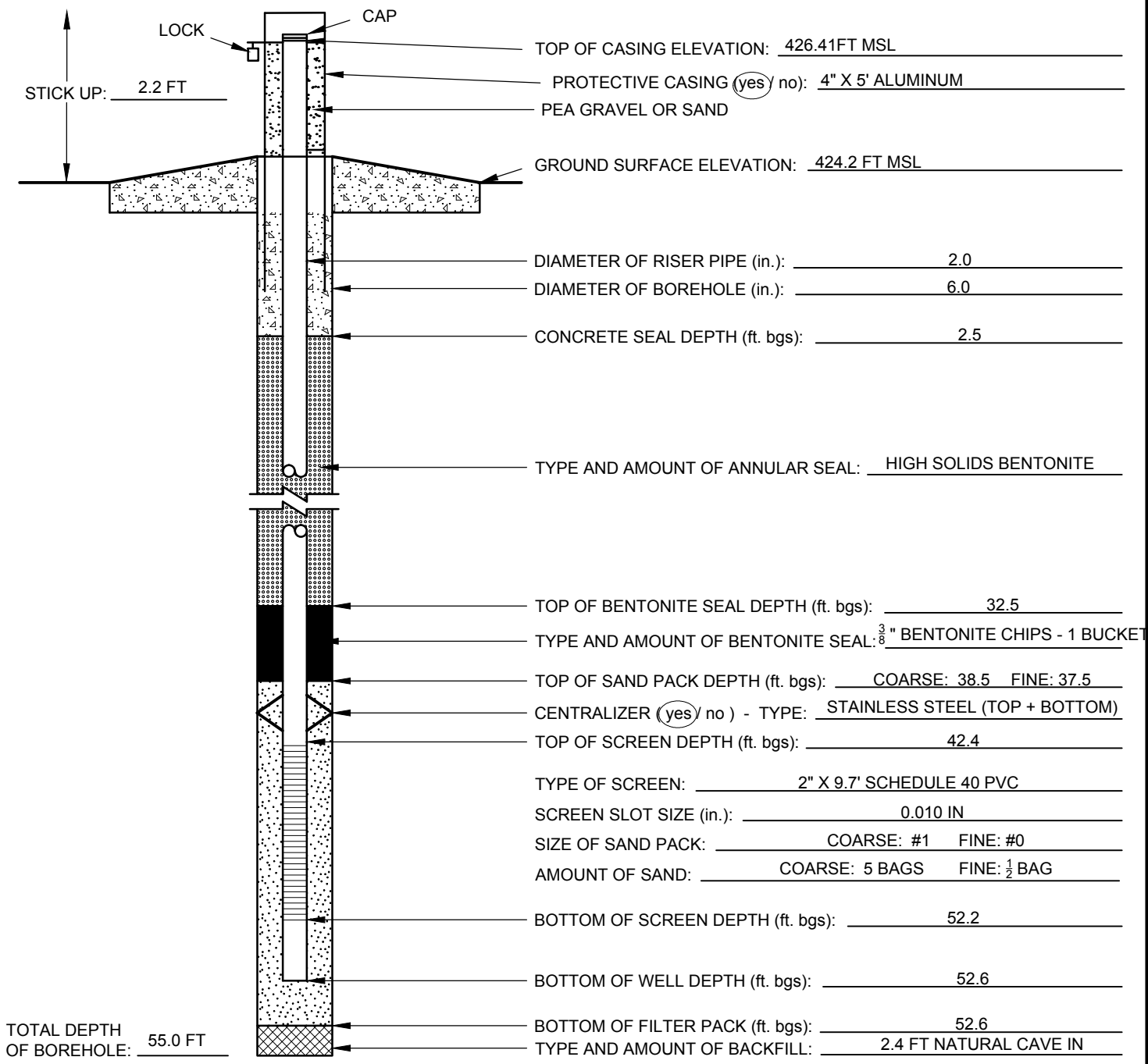
ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.  
 150 GALLONS OF H2O USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FEET (2000)  
 MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88. WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JANUARY 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-3D

PROJECT NAME: AMEREN CCR GW MONITORING		PROJECT NUMBER: 153-1406.0003A	
SITE NAME: SIOUX ENERGY CENTER		LOCATION: BMW-3D	
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 424.2 FT MSL	
GEOLOGIST: J. INGRAM/M. GORE	NORTHING: 1121798.8	EASTING: 875798.3	
DRILLER: M. RODRIGUES	STATIC WATER LEVEL: 8.38 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.  
 200 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 02, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
Pace Project No.: 60215288

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, 1/2/18: Revision

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

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

## CERTIFICATIONS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

---

### 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 #: 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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without the written consent of Pace Analytical Services, LLC.

## SAMPLE SUMMARY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60215288001	S-UMW-1D	Water	03/17/16 13:57	03/19/16 05:55
60215288002	S-UMW-2D	Water	03/16/16 15:02	03/19/16 05:55
60215288003	S-UMW-3D	Water	03/16/16 13:07	03/19/16 05:55
60215288004	S-UMW-4D	Water	03/16/16 11:42	03/19/16 05:55
60215288005	S-UMW-5D	Water	03/16/16 15:30	03/19/16 05:55
60215288006	S-UMW-6D	Water	03/17/16 14:28	03/19/16 05:55
60215288007	S-BMW-1D	Water	03/16/16 10:01	03/19/16 05:55
60215288009	S-UMW-DUP-1	Water	03/16/16 08:00	03/19/16 05:55
60215288010	S-UMW-FB-1	Water	03/16/16 11:10	03/19/16 05:55
60215288011	S-UMW-1D MS	Water	03/17/16 13:57	03/19/16 05:55
60215288012	S-UMW-1D MSD	Water	03/17/16 13:57	03/19/16 05:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60215288001	S-UMW-1D	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
60215288002	S-UMW-2D	EPA 300.0	RAB	3	PASI-K
		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
60215288003	S-UMW-3D	SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288004	S-UMW-4D	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288005	S-UMW-5D	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	AGO	1	PASI-K
		EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	WRR	1	PASI-PA
		EPA 7470	TDS	1	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 200.7	ZBM	8	PASI-K

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60215288006	S-UMW-6D	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288007	S-BMW-1D	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288009	S-UMW-DUP-1	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288010	S-UMW-FB-1	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		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
60215288011	S-UMW-1D MS	SM 2540C	AGO	1	PASI-K
		SM 4500-H+B	LJS	1	PASI-K
		EPA 300.0	RAB	3	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60215288012	S-UMW-1D MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Sample: S-UMW-1D Lab ID: 60215288001 Collected: 03/17/16 13:57 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	161	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:29	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:29	7440-41-7	
Boron	254	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:29	7440-42-8	
Calcium	78400	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:29	7440-70-2	M1
Cobalt	<0.72	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:29	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:29	7439-92-1	
Lithium	13.1	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:29	7439-93-2	
Molybdenum	31.7	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:29	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.13J	ug/L	1.0	0.058	1	03/22/16 13:30	03/23/16 15:42	7440-36-0	
Arsenic	0.90J	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 15:42	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 15:42	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 15:42	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 15:42	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 15:42	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	04/01/16 10:45	04/01/16 15:54	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	389	mg/L	5.0	5.0	1		03/23/16 08:22		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	8.3	Std. Units	0.10	0.10	1		04/03/16 12:05		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	18.9	mg/L	1.0	0.50	1		03/21/16 16:22	16887-00-6	
Fluoride	0.34	mg/L	0.20	0.073	1		03/21/16 16:22	16984-48-8	
Sulfate	80.5	mg/L	20.0	5.0	20		03/21/16 14:54	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-2D**      **Lab ID: 60215288002**      Collected: 03/16/16 15:02      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>122</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:36	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:36	7440-41-7	
Boron	<b>15100</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:36	7440-42-8	
Calcium	<b>200000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:36	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:36	7440-48-4	
Lead	<b>3.9J</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:36	7439-92-1	
Lithium	<b>24.6</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:36	7439-93-2	
Molybdenum	<b>1310</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:36	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.067J</b>	ug/L	1.0	0.058	1	03/22/16 13:30	03/23/16 15:56	7440-36-0	
Arsenic	<b>0.87J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 15:56	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 15:56	7440-43-9	
Chromium	<b>0.35J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 15:56	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 15:56	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 15:56	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 16:01	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1010</b>	mg/L	5.0	5.0	1		03/22/16 10:29		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.1</b>	Std. Units	0.10	0.10	1		03/23/16 10:35		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.5</b>	mg/L	2.0	1.0	2		03/22/16 09:55	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.073	1		03/21/16 17:14	16984-48-8	
Sulfate	<b>524</b>	mg/L	50.0	12.4	50		03/22/16 10:12	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-3D**      **Lab ID: 60215288003**      Collected: 03/16/16 13:07      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>88.0</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:38	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:38	7440-41-7	
Boron	<b>30200</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:38	7440-42-8	
Calcium	<b>293000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:38	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:38	7440-48-4	
Lead	<b>4.2J</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:38	7439-92-1	
Lithium	<b>14.7</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:38	7439-93-2	
Molybdenum	<b>4800</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:38	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.083J</b>	ug/L	1.0	0.058	1	03/22/16 13:30	03/23/16 16:00	7440-36-0	
Arsenic	<b>0.82J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:00	7440-38-2	
Cadmium	<b>&lt;0.058</b>	ug/L	1.0	0.058	2	03/22/16 13:30	03/25/16 13:44	7440-43-9	D3
Chromium	<b>0.56J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:00	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:00	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:00	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	04/01/16 10:45	04/01/16 16:03	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1450</b>	mg/L	5.0	5.0	1		03/22/16 10:29		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</b>	Std. Units	0.10	0.10	1		03/23/16 10:35		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>17.2</b>	mg/L	1.0	0.50	1		03/21/16 17:49	16887-00-6	
Fluoride	<b>0.81</b>	mg/L	0.20	0.073	1		03/21/16 17:49	16984-48-8	
Sulfate	<b>833</b>	mg/L	100	24.8	100		03/22/16 10:30	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-4D**      **Lab ID: 60215288004**      Collected: 03/16/16 11:42      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>95.9</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:40	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:40	7440-41-7	
Boron	<b>31200</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:40	7440-42-8	
Calcium	<b>191000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:40	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:40	7440-48-4	
Lead	<b>3.6J</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:40	7439-92-1	
Lithium	<b>37.9</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:40	7439-93-2	
Molybdenum	<b>8300</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:40	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	03/22/16 13:30	03/23/16 16:04	7440-36-0	
Arsenic	<b>0.70J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:04	7440-38-2	
Cadmium	<b>&lt;0.087</b>	ug/L	1.5	0.087	3	03/22/16 13:30	03/25/16 13:53	7440-43-9	D3
Chromium	<b>0.40J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:04	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:04	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:04	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 16:05	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1100</b>	mg/L	5.0	5.0	1		03/22/16 10:30		
<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		03/23/16 10:35		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.5</b>	mg/L	2.0	1.0	2		03/22/16 11:39	16887-00-6	
Fluoride	<b>0.75</b>	mg/L	0.20	0.073	1		03/21/16 18:23	16984-48-8	
Sulfate	<b>511</b>	mg/L	50.0	12.4	50		03/22/16 10:47	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-5D**      **Lab ID: 60215288005**      Collected: 03/16/16 15:30      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>369</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:43	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:43	7440-41-7	
Boron	<b>10800</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:43	7440-42-8	
Calcium	<b>98400</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:43	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:43	7440-48-4	
Lead	<b>4.8J</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:43	7439-92-1	
Lithium	<b>31.4</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:43	7439-93-2	
Molybdenum	<b>264</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:43	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	03/22/16 13:30	03/23/16 16:09	7440-36-0	
Arsenic	<b>0.80J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:09	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 16:09	7440-43-9	
Chromium	<b>0.42J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:09	7440-47-3	
Selenium	<b>0.20J</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:09	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:09	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	04/01/16 10:45	04/01/16 16:07	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		03/22/16 10:30		
<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		03/23/16 10:35		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.7</b>	mg/L	2.0	1.0	2		03/22/16 11:57	16887-00-6	
Fluoride	<b>0.58</b>	mg/L	0.20	0.073	1		03/21/16 19:33	16984-48-8	
Sulfate	<b>41.5</b>	mg/L	5.0	1.2	5		03/22/16 12:14	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-6D**      **Lab ID: 60215288006**      Collected: 03/17/16 14:28      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>133</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:45	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:45	7440-41-7	
Boron	<b>647</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:45	7440-42-8	
Calcium	<b>79300</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:45	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:45	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:45	7439-92-1	
Lithium	<b>12.6</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:45	7439-93-2	
Molybdenum	<b>95.9</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:45	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	03/22/16 13:30	03/23/16 16:13	7440-36-0	
Arsenic	<b>0.31J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:13	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 16:13	7440-43-9	
Chromium	<b>0.37J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:13	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:13	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:13	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	04/01/16 10:45	04/01/16 16:14	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>345</b>	mg/L	5.0	5.0	1		03/23/16 08:23		
<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		04/03/16 12:05		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>17.3</b>	mg/L	1.0	0.50	1		03/21/16 20:08	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.073	1		03/21/16 20:08	16984-48-8	
Sulfate	<b>60.0</b>	mg/L	5.0	1.2	5		03/22/16 12:31	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-BMW-1D**      **Lab ID: 60215288007**      Collected: 03/16/16 10:01      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>334</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:47	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:47	7440-41-7	
Boron	<b>193</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:47	7440-42-8	
Calcium	<b>126000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:47	7440-70-2	
Cobalt	<b>0.73J</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:47	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:47	7439-92-1	
Lithium	<b>14.2</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:47	7439-93-2	
Molybdenum	<b>1.3J</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:47	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	03/22/16 13:30	03/23/16 16:27	7440-36-0	
Arsenic	<b>0.20J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:27	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 16:27	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:27	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 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	04/01/16 10:45	04/01/16 16:16	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>471</b>	mg/L	5.0	5.0	1		03/22/16 10:31		
<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		03/22/16 16:15		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.3</b>	mg/L	1.0	0.50	1		03/21/16 20:43	16887-00-6	
Fluoride	<b>0.30</b>	mg/L	0.20	0.073	1		03/21/16 20:43	16984-48-8	
Sulfate	<b>36.5</b>	mg/L	5.0	1.2	5		03/22/16 12:49	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-DUP-1**      **Lab ID: 60215288009**      Collected: 03/16/16 08:00      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>87.9</b>	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:56	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:56	7440-41-7	
Boron	<b>30000</b>	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:56	7440-42-8	
Calcium	<b>288000</b>	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:56	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:56	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:56	7439-92-1	
Lithium	<b>15.2</b>	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:56	7439-93-2	
Molybdenum	<b>4790</b>	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:56	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	03/22/16 13:30	03/23/16 16:35	7440-36-0	
Arsenic	<b>0.76J</b>	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:35	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 16:35	7440-43-9	
Chromium	<b>0.50J</b>	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:35	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:35	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:35	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 16:21	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1420</b>	mg/L	5.0	5.0	1		03/22/16 10:32		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</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>16.9</b>	mg/L	1.0	0.50	1		03/21/16 21:52	16887-00-6	
Fluoride	<b>0.82</b>	mg/L	0.20	0.073	1		03/21/16 21:52	16984-48-8	
Sulfate	<b>823</b>	mg/L	100	24.8	100		03/22/16 13:24	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-FB-1**      **Lab ID: 60215288010**      Collected: 03/16/16 11:10      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	<0.58	ug/L	10.0	0.58	1	03/22/16 13:30	03/23/16 14:58	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	03/22/16 13:30	03/23/16 14:58	7440-41-7	
Boron	52.4J	ug/L	100	50.0	1	03/22/16 13:30	03/23/16 14:58	7440-42-8	
Calcium	930	ug/L	100	8.1	1	03/22/16 13:30	03/23/16 14:58	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	03/22/16 13:30	03/23/16 14:58	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	03/22/16 13:30	03/23/16 14:58	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	03/22/16 13:30	03/23/16 14:58	7439-93-2	
Molybdenum	2.0J	ug/L	20.0	0.52	1	03/22/16 13:30	03/23/16 14:58	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	03/22/16 13:30	03/23/16 16:40	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	03/22/16 13:30	03/23/16 16:40	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	03/22/16 13:30	03/23/16 16:40	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	03/22/16 13:30	03/23/16 16:40	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	03/22/16 13:30	03/23/16 16:40	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	03/22/16 13:30	03/23/16 16:40	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	04/01/16 10:45	04/01/16 16:23	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	8.0	mg/L	5.0	5.0	1		03/22/16 10:32		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	5.9	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	<0.50	mg/L	1.0	0.50	1		03/21/16 23:02	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		03/21/16 23:02	16984-48-8	
Sulfate	<0.25	mg/L	1.0	0.25	1		03/21/16 23:02	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

QC Batch: 423332 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010

METHOD BLANK: 1728575 Matrix: Water  
 Associated Lab Samples: 60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	03/23/16 14:20	
Beryllium	ug/L	<0.26	1.0	0.26	03/23/16 14:20	
Boron	ug/L	<50.0	100	50.0	03/23/16 14:20	
Calcium	ug/L	14.2J	100	8.1	03/23/16 14:20	
Cobalt	ug/L	<0.72	5.0	0.72	03/23/16 14:20	
Lead	ug/L	<2.5	5.0	2.5	03/23/16 14:20	
Lithium	ug/L	<4.9	10.0	4.9	03/23/16 14:20	
Molybdenum	ug/L	<0.52	20.0	0.52	03/23/16 14:20	

LABORATORY CONTROL SAMPLE: 1728576

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1040	104	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	1030	103	85-115	
Lead	ug/L	1000	1020	102	85-115	
Lithium	ug/L	1000	986	99	85-115	
Molybdenum	ug/L	1000	1080	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1728577 1728578

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60215288001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Barium	ug/L	161	1000	1000	1160	1160	100	100	70-130	0	20	
Beryllium	ug/L	<0.26	1000	1000	985	985	98	99	70-130	0	20	
Boron	ug/L	254	1000	1000	1260	1260	100	101	70-130	0	20	
Calcium	ug/L	78400	10000	10000	84100	85400	57	71	70-130	2	20	M1
Cobalt	ug/L	<0.72	1000	1000	988	987	99	99	70-130	0	20	
Lead	ug/L	<2.5	1000	1000	992	991	99	99	70-130	0	20	
Lithium	ug/L	13.1	1000	1000	998	1000	98	99	70-130	0	20	
Molybdenum	ug/L	31.7	1000	1000	1090	1090	106	105	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

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QC Batch: 423333 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010

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METHOD BLANK: 1728579 Matrix: Water  
 Associated Lab Samples: 60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	03/23/16 15:34	
Arsenic	ug/L	<0.10	1.0	0.10	03/23/16 15:34	
Cadmium	ug/L	<0.029	0.50	0.029	03/23/16 15:34	
Chromium	ug/L	<0.34	1.0	0.34	03/23/16 15:34	
Selenium	ug/L	<0.18	1.0	0.18	03/23/16 15:34	
Thallium	ug/L	<0.50	1.0	0.50	03/23/16 15:34	

LABORATORY CONTROL SAMPLE: 1728580

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	42.1	105	85-115	
Arsenic	ug/L	40	40.7	102	85-115	
Cadmium	ug/L	40	42.2	105	85-115	
Chromium	ug/L	40	40.9	102	85-115	
Selenium	ug/L	40	43.3	108	85-115	
Thallium	ug/L	40	38.2	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1728581 1728582

Parameter	Units	60215288001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	0.13J	40	40	40.5	40.2	101	100	70-130	1	20		
Arsenic	ug/L	0.90J	40	40	40.4	40.0	99	98	70-130	1	20		
Cadmium	ug/L	<0.029	40	40	39.5	38.7	99	97	70-130	2	20		
Chromium	ug/L	<0.34	40	40	39.7	39.4	98	98	70-130	1	20		
Selenium	ug/L	<0.18	40	40	39.6	39.6	99	99	70-130	0	20		
Thallium	ug/L	<0.50	40	40	37.2	36.9	93	92	70-130	1	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

QC Batch: 423301

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60215288002, 60215288003, 60215288004, 60215288005, 60215288007, 60215288009, 60215288010

METHOD BLANK: 1728448

Matrix: Water

Associated Lab Samples: 60215288002, 60215288003, 60215288004, 60215288005, 60215288007, 60215288009, 60215288010

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-BOTTOM

Pace Project No.: 60215288

QC Batch: 423408

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60215288001, 60215288006

METHOD BLANK: 1728797

Matrix: Water

Associated Lab Samples: 60215288001, 60215288006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/23/16 08:20	

LABORATORY CONTROL SAMPLE: 1728798

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	951	95	80-120	

SAMPLE DUPLICATE: 1728799

Parameter	Units	60215288001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	389	389	0	10	

SAMPLE DUPLICATE: 1728800

Parameter	Units	60215292004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	468	609	26	10 D6	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

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

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

Associated Lab Samples: 60215288007, 60215288009, 60215288010

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-BOTTOM

Pace Project No.: 60215288

QC Batch: 423374 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60215288002, 60215288003, 60215288004, 60215288005

SAMPLE DUPLICATE: 1728707

Parameter	Units	60215292004 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

QC Batch: 424886 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60215288001, 60215288006

SAMPLE DUPLICATE: 1735395

Parameter	Units	60215288001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.3	8.3	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

QC Batch:	423186	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010		

METHOD BLANK: 1728031 Matrix: Water  
Associated Lab Samples: 60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/21/16 14:20	
Fluoride	mg/L	<0.073	0.20	0.073	03/21/16 14:20	
Sulfate	mg/L	<0.25	1.0	0.25	03/21/16 14:20	

METHOD BLANK: 1728422 Matrix: Water  
Associated Lab Samples: 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/22/16 09:20	
Sulfate	mg/L	<0.25	1.0	0.25	03/22/16 09:20	

LABORATORY CONTROL SAMPLE: 1728032

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	
Sulfate	mg/L	5	5.0	99	90-110	

LABORATORY CONTROL SAMPLE: 1728423

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1728033 1728034

Parameter	Units	60215288001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Chloride	mg/L	18.9	5	5	23.4	23.4	90	89	80-120	0	15		
Fluoride	mg/L	0.34	2.5	2.5	2.6	2.6	92	91	80-120	1	15		
Sulfate	mg/L	80.5	100	100	173	175	92	94	80-120	1	15		

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.119 ± 0.369 (0.715)</b> <b>C:NA T:92%</b>	pCi/L	04/07/16 12:51	13982-63-3	
Radium-228	EPA 904.0	<b>0.290 ± 0.366 (0.778)</b> <b>C:80% T:91%</b>	pCi/L	04/08/16 13:25	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-2D**      **Lab ID: 60215288002**      Collected: 03/16/16 15:02      Received: 03/19/16 05:55      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>0.319 ± 0.333 (0.469)</b> <b>C:NA T:90%</b>	pCi/L	04/07/16 12:39	13982-63-3	
Radium-228	EPA 904.0	<b>-0.0628 ± 0.299 (0.709)</b> <b>C:82% T:90%</b>	pCi/L	04/08/16 12:45	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-3D**      **Lab ID: 60215288003**      Collected: 03/16/16 13:07      Received: 03/19/16 05:55      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>0.280 ± 0.293 (0.413)</b> <b>C:NA T:90%</b>	pCi/L	04/07/16 13:02	13982-63-3	
Radium-228	EPA 904.0	<b>0.251 ± 0.299 (0.629)</b> <b>C:83% T:87%</b>	pCi/L	04/08/16 12:46	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-4D**      **Lab ID: 60215288004**      Collected: 03/16/16 11:42      Received: 03/19/16 05:55      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>0.235 ± 0.432 (0.771)</b> <b>C:NA T:95%</b>	pCi/L	04/07/16 13:02	13982-63-3	
Radium-228	EPA 904.0	<b>0.449 ± 0.510 (1.08)</b> <b>C:83% T:83%</b>	pCi/L	04/08/16 16:55	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Sample: <b>S-UMW-5D</b>	Lab ID: <b>60215288005</b>	Collected: 03/16/16 15:30	Received: 03/19/16 05:55	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>0.553 ± 0.367 (0.166)</b> <b>C:NA T:90%</b>	pCi/L	04/07/16 12:29	13982-63-3	
Radium-228	EPA 904.0	<b>0.730 ± 0.399 (0.730)</b> <b>C:83% T:91%</b>	pCi/L	04/08/16 16:55	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-6D**      **Lab ID: 60215288006**      Collected: 03/17/16 14:28      Received: 03/19/16 05:55      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>0.111 ± 0.254 (0.151)</b> <b>C:NA T:90%</b>	pCi/L	04/07/16 12:52	13982-63-3	
Radium-228	EPA 904.0	<b>0.472 ± 0.444 (0.919)</b> <b>C:85% T:83%</b>	pCi/L	04/08/16 16:55	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.158 ± 0.311 (0.568)</b> C:NA T:99%	pCi/L	04/07/16 19:57	13982-63-3	
Radium-228	EPA 904.0	<b>0.638 ± 0.430 (0.840)</b> C:84% T:89%	pCi/L	04/08/16 16:55	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-DUP-1**      **Lab ID: 60215288009**      Collected: 03/16/16 08:00      Received: 03/19/16 05:55      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>-0.057 ± 0.260 (0.613)</b> <b>C:NA T:93%</b>	pCi/L	04/07/16 19:57	13982-63-3	
Radium-228	EPA 904.0	<b>0.187 ± 0.349 (0.766)</b> <b>C:80% T:86%</b>	pCi/L	04/08/16 16:59	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-FB-1**      **Lab ID: 60215288010**      Collected: 03/16/16 11:10      Received: 03/19/16 05:55      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>0.114 ± 0.273 (0.528)</b> C:NA T:91%	pCi/L	04/07/16 20:09	13982-63-3	
Radium-228	EPA 904.0	<b>0.447 ± 0.348 (0.691)</b> C:82% T:94%	pCi/L	04/08/16 16:59	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-1D MS**      **Lab ID: 60215288011**      Collected: 03/17/16 13:57      Received: 03/19/16 05:55      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>85.11 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	04/07/16 19:57	13982-63-3	
Radium-228	EPA 904.0	<b>82.6 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	04/08/16 17:29	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

**Sample: S-UMW-1D MSD**      **Lab ID: 60215288012**      Collected: 03/17/16 13:57      Received: 03/19/16 05:55      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>95.29 %REC</b> <b>11.29 RPD ±</b> <b>NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	04/07/16 21:24	13982-63-3	
Radium-228	EPA 904.0	<b>80.4 %REC</b> <b>2.70 RPD +/-</b> <b>NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	04/08/16 17:29	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

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QC Batch:	214144	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010, 60215288011, 60215288012		

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METHOD BLANK:	1046812	Matrix:	Water
Associated Lab Samples:	60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010, 60215288011, 60215288012		

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Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.113 ± 0.259 (0.610) C:NA T:101%	pCi/L	04/07/16 12:28	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

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QC Batch:	214972	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010, 60215288011, 60215288012		

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METHOD BLANK:	1050674	Matrix:	Water
Associated Lab Samples:	60215288001, 60215288002, 60215288003, 60215288004, 60215288005, 60215288006, 60215288007, 60215288009, 60215288010, 60215288011, 60215288012		

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	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

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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

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

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.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60215288001	S-UMW-1D	EPA 200.7	423332	EPA 200.7	423386
60215288002	S-UMW-2D	EPA 200.7	423332	EPA 200.7	423386
60215288003	S-UMW-3D	EPA 200.7	423332	EPA 200.7	423386
60215288004	S-UMW-4D	EPA 200.7	423332	EPA 200.7	423386
60215288005	S-UMW-5D	EPA 200.7	423332	EPA 200.7	423386
60215288006	S-UMW-6D	EPA 200.7	423332	EPA 200.7	423386
60215288007	S-BMW-1D	EPA 200.7	423332	EPA 200.7	423386
60215288009	S-UMW-DUP-1	EPA 200.7	423332	EPA 200.7	423386
60215288010	S-UMW-FB-1	EPA 200.7	423332	EPA 200.7	423386
60215288001	S-UMW-1D	EPA 200.8	423333	EPA 200.8	423387
60215288002	S-UMW-2D	EPA 200.8	423333	EPA 200.8	423387
60215288003	S-UMW-3D	EPA 200.8	423333	EPA 200.8	423387
60215288004	S-UMW-4D	EPA 200.8	423333	EPA 200.8	423387
60215288005	S-UMW-5D	EPA 200.8	423333	EPA 200.8	423387
60215288006	S-UMW-6D	EPA 200.8	423333	EPA 200.8	423387
60215288007	S-BMW-1D	EPA 200.8	423333	EPA 200.8	423387
60215288009	S-UMW-DUP-1	EPA 200.8	423333	EPA 200.8	423387
60215288010	S-UMW-FB-1	EPA 200.8	423333	EPA 200.8	423387
60215288001	S-UMW-1D	EPA 7470	424743	EPA 7470	424782
60215288002	S-UMW-2D	EPA 7470	424743	EPA 7470	424782
60215288003	S-UMW-3D	EPA 7470	424743	EPA 7470	424782
60215288004	S-UMW-4D	EPA 7470	424743	EPA 7470	424782
60215288005	S-UMW-5D	EPA 7470	424743	EPA 7470	424782
60215288006	S-UMW-6D	EPA 7470	424743	EPA 7470	424782
60215288007	S-BMW-1D	EPA 7470	424743	EPA 7470	424782
60215288009	S-UMW-DUP-1	EPA 7470	424743	EPA 7470	424782
60215288010	S-UMW-FB-1	EPA 7470	424743	EPA 7470	424782
60215288001	S-UMW-1D	EPA 903.1	214144		
60215288002	S-UMW-2D	EPA 903.1	214144		
60215288003	S-UMW-3D	EPA 903.1	214144		
60215288004	S-UMW-4D	EPA 903.1	214144		
60215288005	S-UMW-5D	EPA 903.1	214144		
60215288006	S-UMW-6D	EPA 903.1	214144		
60215288007	S-BMW-1D	EPA 903.1	214144		
60215288009	S-UMW-DUP-1	EPA 903.1	214144		
60215288010	S-UMW-FB-1	EPA 903.1	214144		
60215288011	S-UMW-1D MS	EPA 903.1	214144		
60215288012	S-UMW-1D MSD	EPA 903.1	214144		
60215288001	S-UMW-1D	EPA 904.0	214972		
60215288002	S-UMW-2D	EPA 904.0	214972		
60215288003	S-UMW-3D	EPA 904.0	214972		
60215288004	S-UMW-4D	EPA 904.0	214972		
60215288005	S-UMW-5D	EPA 904.0	214972		
60215288006	S-UMW-6D	EPA 904.0	214972		
60215288007	S-BMW-1D	EPA 904.0	214972		
60215288009	S-UMW-DUP-1	EPA 904.0	214972		
60215288010	S-UMW-FB-1	EPA 904.0	214972		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60215288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60215288011	S-UMW-1D MS	EPA 904.0	214972		
60215288012	S-UMW-1D MSD	EPA 904.0	214972		
60215288001	S-UMW-1D	SM 2540C	423408		
60215288002	S-UMW-2D	SM 2540C	423301		
60215288003	S-UMW-3D	SM 2540C	423301		
60215288004	S-UMW-4D	SM 2540C	423301		
60215288005	S-UMW-5D	SM 2540C	423301		
60215288006	S-UMW-6D	SM 2540C	423408		
60215288007	S-BMW-1D	SM 2540C	423301		
60215288009	S-UMW-DUP-1	SM 2540C	423301		
60215288010	S-UMW-FB-1	SM 2540C	423301		
60215288001	S-UMW-1D	SM 4500-H+B	424886		
60215288002	S-UMW-2D	SM 4500-H+B	423374		
60215288003	S-UMW-3D	SM 4500-H+B	423374		
60215288004	S-UMW-4D	SM 4500-H+B	423374		
60215288005	S-UMW-5D	SM 4500-H+B	423374		
60215288006	S-UMW-6D	SM 4500-H+B	424886		
60215288007	S-BMW-1D	SM 4500-H+B	423206		
60215288009	S-UMW-DUP-1	SM 4500-H+B	423206		
60215288010	S-UMW-FB-1	SM 4500-H+B	423206		
60215288001	S-UMW-1D	EPA 300.0	423186		
60215288002	S-UMW-2D	EPA 300.0	423186		
60215288003	S-UMW-3D	EPA 300.0	423186		
60215288004	S-UMW-4D	EPA 300.0	423186		
60215288005	S-UMW-5D	EPA 300.0	423186		
60215288006	S-UMW-6D	EPA 300.0	423186		
60215288007	S-BMW-1D	EPA 300.0	423186		
60215288009	S-UMW-DUP-1	EPA 300.0	423186		
60215288010	S-UMW-FB-1	EPA 300.0	423186		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60215288



60215288

Client Name: Goldner

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 and Blue None  Samples received on ice, cooling process has begun.

Cooler Temperature: 15.1, 3.6, 13.4

Temperature should be above freezing to 6°C

Date and initials of person examining contents: JS 3/9/16

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1. - Cooler temps acceptable.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2. - 2 cooler w/o ice contained
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3. Radium testing volume only
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:		
Pace containers used:	<u>Jami Church</u>	
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	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	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: 3/21/16

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

<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)	Company Name: Jeffrey Ingram	Attention: Mark Haddock	Company Name: Jeffrey Ingram	Attention: Mark Haddock
Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Copy To: Jeffrey Ingram	Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Project Name: Ameren Sioux Energy Center - Bottom Ash	Address: 820 South Main Street, Suite 100 St Charles, MO 63301	Project Name: Ameren Sioux Energy Center - Bottom Ash
Email To: mhaddock@golder.com	Purchase Order No.:	Project Name: Ameren Sioux Energy Center - Bottom Ash	Project Profile #: 9285	Project Name: Ameren Sioux Energy Center - Bottom Ash	Project Profile #: 9285
Phone: 636-724-9191	Fax: 636-724-9323	Project Number: 153-1406.0003A		Project Number: 153-1406.0003A	
Requested Due Date/TAT: Standard					

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW 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	PRESERVATIVES		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				DATE	TIME							
1	S-UMW-1D			G	WT	18				3	7	3	12		001
2	S-UMW-2D			G	WT	6				1	1	1	4		002
3	S-UMW-3D			G	WT	6				1	1	1	4		003
4	S-UMW-4D			G	WT	6				1	1	1	4		004
5	S-UMW-5D			G	WT	6				1	1	1	4		005
6	S-UMW-6D			G	WT	6				1	1	1	4		006
7	S-BMW-1D			G	WT	6				1	1	1	4		007
8	S-BMW-2D			G	WT	6				1	1	1	4		008
9	S-UMW-DUP-1			G	WT	6				1	1	1	4		009
10	S-UMW-FB-1			G	WT	6				1	1	1	4		010

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		DATE		TIME		SAMPLE CONDITIONS	
	DATE	TIME	DATE	TIME	RECEIVED ON	COOLER (Y/N)	TEMP IN °C	SAMPLES INTACT		
	3/18/16	12:11	3/18/16	12:11	15.1	N	15.1	Y		
	3/18/16	17:02	3/19/16	05:55	3.6	Y	3.6	Y		
					13.4	N	13.4	Y		

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: John Sworezi  
 SIGNATURE of SAMPLER: *John Sworezi*  
 DATE Signed (MM/DD/YYYY): 03/18/2016

\*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.

January 02, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
Pace Project No.: 60219054

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.

REV-1, 1/2/18: Revision

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-BOTTOM

Pace Project No.: 60219054

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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-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60219054001	S-UMW-1D	Water	05/10/16 10:19	05/13/16 03:30
60219054002	S-UMW-2D	Water	05/10/16 14:45	05/13/16 03:30
60219054003	S-UMW-3D	Water	05/10/16 13:17	05/13/16 03:30
60219054004	S-UMW-4D	Water	05/10/16 11:55	05/13/16 03:30
60219054005	S-UMW-5D	Water	05/10/16 14:17	05/13/16 03:30
60219054006	S-UMW-6D	Water	05/10/16 13:02	05/13/16 03:30
60219054007	S-BMW-1D	Water	05/09/16 11:15	05/13/16 03:30
60219054009	S-UMW-DUP-1	Water	05/10/16 08:00	05/13/16 03:30
60219054010	S-UMW-FB-1	Water	05/10/16 12:52	05/13/16 03:30
60219054011	S-UMW-1D MS	Water	05/10/13 10:19	05/13/16 03:30
60219054012	S-UMW-1D MSD	Water	05/10/13 10:19	05/13/16 03:30

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60219054001	S-UMW-1D	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
		SM 4500-H+B	CRS	1	PASI-K
60219054002	S-UMW-2D	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
60219054003	S-UMW-3D	SM 4500-H+B	CRS	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
60219054004	S-UMW-4D	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	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
60219054005	S-UMW-5D	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
		EPA 200.7	ZBM	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	TDS	1	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60219054006	S-UMW-6D	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	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
60219054007	S-BMW-1D	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	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
60219054009	S-UMW-DUP-1	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	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
60219054010	S-UMW-FB-1	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	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
60219054011	S-UMW-1D MS	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	CRS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60219054012	S-UMW-1D MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-1D**      **Lab ID: 60219054001**      Collected: 05/10/16 10:19      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>120</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 09:50	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 09:50	7440-41-7	
Boron	<b>614</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 09:50	7440-42-8	
Calcium	<b>62700</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 09:50	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 09:50	7440-48-4	
Lead	<b>3.0J</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 09:50	7439-92-1	
Lithium	<b>14.6</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 09:50	7439-93-2	
Molybdenum	<b>38.3</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 09:50	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.11J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 11:36	7440-36-0	
Arsenic	<b>0.90J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 11:36	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 11:36	7440-43-9	
Chromium	<b>0.62J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 11:36	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 11:36	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 11:36	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	05/19/16 10:00	05/19/16 13:45	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>321</b>	mg/L	5.0	5.0	1		05/16/16 08:50		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>20.0</b>	mg/L	1.0	0.50	1		05/25/16 20:27	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.073	1		05/25/16 20:27	16984-48-8	
Sulfate	<b>61.1</b>	mg/L	5.0	1.2	5		05/27/16 14:13	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-2D**      **Lab ID: 60219054002**      Collected: 05/10/16 14:45      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>121</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 09:56	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 09:56	7440-41-7	
Boron	<b>18800</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 09:56	7440-42-8	
Calcium	<b>226000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 09:56	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 09:56	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 09:56	7439-92-1	
Lithium	<b>29.7</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 09:56	7439-93-2	
Molybdenum	<b>1440</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 09:56	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.077J</b>	ug/L	1.0	0.058	1	05/16/16 15:30	05/24/16 11:49	7440-36-0	
Arsenic	<b>1.1</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 11:49	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 11:49	7440-43-9	
Chromium	<b>0.66J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 11:49	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 11:49	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 11:49	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 13:52	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1110</b>	mg/L	5.0	5.0	1		05/16/16 08:55		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</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>21.2</b>	mg/L	2.0	1.0	2		05/27/16 14:58	16887-00-6	
Fluoride	<b>1.3</b>	mg/L	0.20	0.073	1		05/25/16 21:10	16984-48-8	
Sulfate	<b>641</b>	mg/L	50.0	12.4	50		05/27/16 15:13	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-3D**      **Lab ID: 60219054003**      Collected: 05/10/16 13:17      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>75.6</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 09:59	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 09:59	7440-41-7	
Boron	<b>26100</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 09:59	7440-42-8	
Calcium	<b>256000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 09:59	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 09:59	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 09:59	7439-92-1	
Lithium	<b>27.2</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 09:59	7439-93-2	
Molybdenum	<b>4250</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 09:59	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	05/16/16 15:30	05/24/16 11:54	7440-36-0	
Arsenic	<b>0.85J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 11:54	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 11:54	7440-43-9	
Chromium	<b>0.62J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 11:54	7440-47-3	
Selenium	<b>0.23J</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 11:54	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 11:54	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	05/19/16 10:00	05/19/16 13:54	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1210</b>	mg/L	5.0	5.0	1		05/16/16 08:56		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>23.5</b>	mg/L	2.0	1.0	2		05/27/16 15:28	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.073	1		05/25/16 21:38	16984-48-8	
Sulfate	<b>663</b>	mg/L	100	24.8	100		05/27/16 15:42	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-4D**      **Lab ID: 60219054004**      Collected: 05/10/16 11:55      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>78.4</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:01	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:01	7440-41-7	
Boron	<b>26300</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:01	7440-42-8	
Calcium	<b>177000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:01	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:01	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:01	7439-92-1	
Lithium	<b>39.6</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:01	7439-93-2	
Molybdenum	<b>7220</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:01	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	05/16/16 15:30	05/24/16 11:58	7440-36-0	
Arsenic	<b>0.60J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 11:58	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 11:58	7440-43-9	
Chromium	<b>0.48J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 11:58	7440-47-3	
Selenium	<b>0.21J</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 11:58	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 11:58	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	05/19/16 10:00	05/19/16 13:56	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1000</b>	mg/L	5.0	5.0	1		05/16/16 08:56		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.5</b>	mg/L	2.0	1.0	2		05/27/16 15:57	16887-00-6	
Fluoride	<b>0.89</b>	mg/L	0.20	0.073	1		05/25/16 22:35	16984-48-8	
Sulfate	<b>397</b>	mg/L	50.0	12.4	50		05/27/16 16:12	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-5D**      **Lab ID: 60219054005**      Collected: 05/10/16 14:17      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>333</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:03	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:03	7440-41-7	
Boron	<b>11800</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:03	7440-42-8	
Calcium	<b>97000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:03	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:03	7440-48-4	
Lead	<b>2.5J</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:03	7439-92-1	
Lithium	<b>32.5</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:03	7439-93-2	
Molybdenum	<b>271</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:03	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	05/16/16 15:30	05/24/16 12:02	7440-36-0	
Arsenic	<b>0.88J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:02	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:02	7440-43-9	
Chromium	<b>0.56J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:02	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:02	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:02	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 13:58	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>453</b>	mg/L	5.0	5.0	1		05/16/16 08:57		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>7.3</b>	mg/L	2.0	1.0	2		05/27/16 16:27	16887-00-6	
Fluoride	<b>0.65</b>	mg/L	0.20	0.073	1		05/25/16 22:49	16984-48-8	
Sulfate	<b>26.1</b>	mg/L	2.0	0.50	2		05/27/16 16:27	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-6D**      **Lab ID: 60219054006**      Collected: 05/10/16 13:02      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>129</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:05	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:05	7440-41-7	
Boron	<b>680</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:05	7440-42-8	
Calcium	<b>82800</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:05	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:05	7440-48-4	
Lead	<b>2.9J</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:05	7439-92-1	
Lithium	<b>14.4</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:05	7439-93-2	
Molybdenum	<b>106</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:05	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	05/16/16 15:30	05/24/16 12:07	7440-36-0	
Arsenic	<b>0.20J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:07	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:07	7440-43-9	
Chromium	<b>0.41J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:07	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:07	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:07	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 14:05	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>377</b>	mg/L	5.0	5.0	1		05/16/16 08:57		
<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>18.6</b>	mg/L	5.0	2.5	5		05/28/16 15:59	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.073	1		05/28/16 15:44	16984-48-8	
Sulfate	<b>66.2</b>	mg/L	5.0	1.2	5		05/28/16 15:59	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-BMW-1D**      **Lab ID: 60219054007**      Collected: 05/09/16 11:15      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>314</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:12	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:12	7440-41-7	
Boron	<b>182</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:12	7440-42-8	
Calcium	<b>132000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:12	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:12	7440-48-4	
Lead	<b>3.7J</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:12	7439-92-1	
Lithium	<b>16.8</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:12	7439-93-2	
Molybdenum	<b>0.53J</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:12	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	05/16/16 15:30	05/24/16 12:24	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:24	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:24	7440-43-9	
Chromium	<b>0.58J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:24	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:24	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:24	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 14:07	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>465</b>	mg/L	5.0	5.0	1		05/16/16 08:40		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.5</b>	mg/L	1.0	0.50	1		05/25/16 23:18	16887-00-6	
Fluoride	<b>0.35</b>	mg/L	0.20	0.073	1		05/25/16 23:18	16984-48-8	
Sulfate	<b>39.9</b>	mg/L	5.0	1.2	5		05/27/16 17:42	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-DUP-1**      **Lab ID: 60219054009**      Collected: 05/10/16 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>80.4</b>	ug/L	10.0	0.58	1	05/16/16 15:25	05/20/16 10:17	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:17	7440-41-7	
Boron	<b>26800</b>	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:17	7440-42-8	
Calcium	<b>183000</b>	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:17	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:17	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:17	7439-92-1	
Lithium	<b>39.3</b>	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:17	7439-93-2	
Molybdenum	<b>7380</b>	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:17	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	05/16/16 15:30	05/24/16 12:37	7440-36-0	
Arsenic	<b>0.71J</b>	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:37	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:37	7440-43-9	
Chromium	<b>0.53J</b>	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:37	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:37	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:37	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 14:12	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>989</b>	mg/L	5.0	5.0	1		05/17/16 10:00		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>26.3</b>	mg/L	2.0	1.0	2		05/27/16 18:26	16887-00-6	
Fluoride	<b>0.88</b>	mg/L	0.20	0.073	1		05/25/16 23:46	16984-48-8	
Sulfate	<b>484</b>	mg/L	50.0	12.4	50		05/27/16 18:41	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-FB-1**      **Lab ID: 60219054010**      Collected: 05/10/16 12:52      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 15:25	05/20/16 10:19	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	05/16/16 15:25	05/20/16 10:19	7440-41-7	
Boron	51.1J	ug/L	100	50.0	1	05/16/16 15:25	05/20/16 10:19	7440-42-8	
Calcium	58.9J	ug/L	100	8.1	1	05/16/16 15:25	05/20/16 10:19	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	05/16/16 15:25	05/20/16 10:19	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	05/16/16 15:25	05/20/16 10:19	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	05/16/16 15:25	05/20/16 10:19	7439-93-2	
Molybdenum	4.3J	ug/L	20.0	0.52	1	05/16/16 15:25	05/20/16 10:19	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 12:20	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	05/16/16 15:30	05/24/16 12:20	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	05/16/16 15:30	05/24/16 12:20	7440-43-9	
Chromium	0.56J	ug/L	1.0	0.34	1	05/16/16 15:30	05/24/16 12:20	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	05/16/16 15:30	05/24/16 12:20	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	05/16/16 15:30	05/24/16 12:20	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 14:14	7439-97-6	L3
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		05/17/16 10:00		
<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		05/13/16 13:45		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		05/26/16 00:00	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		05/26/16 00:00	16984-48-8	
Sulfate	0.39J	mg/L	1.0	0.25	1		05/26/16 00:00	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

QC Batch:	430503	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010		

METHOD BLANK:	1759373	Matrix:	Water
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010		

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 CTR-BOTTOM

Pace Project No.: 60219054

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 CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 430505 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010

METHOD BLANK: 1759384 Matrix: Water  
 Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.11J	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	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

MATRIX SPIKE SAMPLE:		1759388					
Parameter	Units	60219054007 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
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 CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 430413

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007

METHOD BLANK: 1759175

Matrix: Water

Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007

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 CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 430619

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60219054009, 60219054010

METHOD BLANK: 1759725

Matrix: Water

Associated Lab Samples: 60219054009, 60219054010

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 CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 430313

Analysis Method: SM 4500-H+B

QC Batch Method: SM 4500-H+B

Analysis Description: 4500H+B pH

Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010

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 CTR-BOTTOM

Pace Project No.: 60219054

QC Batch:	431968	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054007, 60219054009, 60219054010		

METHOD BLANK:	1765145	Matrix:	Water
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054007, 60219054009, 60219054010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	05/25/16 19:59	
Fluoride	mg/L	<0.073	0.20	0.073	05/25/16 19:59	
Sulfate	mg/L	<0.25	1.0	0.25	05/25/16 19:59	

LABORATORY CONTROL SAMPLE: 1765146						
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	97	90-110	
Sulfate	mg/L	5	5.1	103	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1765147												1765148	
Parameter	Units	60219054001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Chloride	mg/L	20.0	10	10	29.2	29.1	92	92	80-120	0	15		
Fluoride	mg/L	0.31	5	5	5.1	5.1	96	95	80-120	0	15		

MATRIX SPIKE SAMPLE: 1765149											
Parameter	Units	60219054002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers				
Fluoride	mg/L	1.3	2.5	3.9	106	80-120					

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

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QC Batch: 432356 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054007, 60219054009

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METHOD BLANK: 1766802 Matrix: Water  
 Associated Lab Samples: 60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054007, 60219054009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	05/27/16 13:13	
Sulfate	mg/L	<0.25	1.0	0.25	05/27/16 13:13	

LABORATORY CONTROL SAMPLE: 1766803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1766804 1766805

Parameter	Units	60219054001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	61.1	25	25	87.6	87.7	106	106	80-120	0	15	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 432449

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60219054006

METHOD BLANK: 1767357

Matrix: Water

Associated Lab Samples: 60219054006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	05/28/16 14:00	
Fluoride	mg/L	<0.073	0.20	0.073	05/28/16 14:00	
Sulfate	mg/L	<0.25	1.0	0.25	05/28/16 14:00	

LABORATORY CONTROL SAMPLE: 1767358

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	
Sulfate	mg/L	5	5.4	108	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 CTR-BOTTOM

Pace Project No.: 60219054

Sample: S-UMW-1D		Lab ID: 60219054001	Collected: 05/10/16 10:19	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>0.247 ± 0.344 (0.574)</b>		pCi/L	06/07/16 13:15	13982-63-3	
		<b>C:NA T:99%</b>					
Radium-228	EPA 904.0	<b>0.939 ± 0.493 (0.879)</b>		pCi/L	06/13/16 19:33	15262-20-1	
		<b>C:81% T:87%</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-2D**      **Lab ID: 60219054002**      Collected: 05/10/16 14:45      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>0.0653 ± 0.424 (0.856)</b> C:NA T:93%	pCi/L	06/07/16 13:09	13982-63-3	
Radium-228	EPA 904.0	<b>0.432 ± 0.450 (0.935)</b> C:75% T:72%	pCi/L	06/02/16 12:11	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-3D**      **Lab ID: 60219054003**      Collected: 05/10/16 13:17      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>-0.068 ± 0.312 (0.735)</b> C:NA T:92%	pCi/L	06/07/16 13:46	13982-63-3	
Radium-228	EPA 904.0	<b>0.775 ± 0.437 (0.804)</b> C:80% T:82%	pCi/L	06/02/16 12:12	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-4D**      **Lab ID: 60219054004**      Collected: 05/10/16 11:55      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>0.351 ± 0.415 (0.653)</b> <b>C:NA T:95%</b>	pCi/L	06/07/16 14:10	13982-63-3	
Radium-228	EPA 904.0	<b>0.385 ± 0.338 (0.681)</b> <b>C:80% T:80%</b>	pCi/L	06/02/16 12:04	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.864 ± 0.499 (0.195)</b> C:NA T:92%	pCi/L	06/07/16 19:14	13982-63-3	
Radium-228	EPA 904.0	<b>0.671 ± 0.353 (0.609)</b> C:76% T:86%	pCi/L	06/02/16 12:05	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

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:91%	pCi/L	06/07/16 19:31	13982-63-3	
Radium-228	EPA 904.0	<b>0.594 ± 0.382 (0.713)</b> C:79% T:75%	pCi/L	06/02/16 12:04	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-BMW-1D**      **Lab ID: 60219054007**      Collected: 05/09/16 11:15      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>0.264 ± 0.410 (0.709)</b> C:NA T:94%	pCi/L	06/07/16 19:13	13982-63-3	
Radium-228	EPA 904.0	<b>0.785 ± 0.422 (0.761)</b> C:77% T:85%	pCi/L	06/02/16 12:07	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-DUP-1**      **Lab ID: 60219054009**      Collected: 05/10/16 08:00      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>0.662 ± 0.491 (0.615)</b> <b>C:NA T:93%</b>	pCi/L	06/07/16 19:29	13982-63-3	
Radium-228	EPA 904.0	<b>0.572 ± 0.394 (0.759)</b> <b>C:78% T:80%</b>	pCi/L	06/02/16 12:04	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-FB-1**      **Lab ID: 60219054010**      Collected: 05/10/16 12:52      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>0.000 ± 0.388 (0.820)</b> <b>C:NA T:98%</b>	pCi/L	06/07/16 19:43	13982-63-3	
Radium-228	EPA 904.0	<b>0.831 ± 0.424 (0.751)</b> <b>C:79% T:86%</b>	pCi/L	06/02/16 12:04	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

**Sample: S-UMW-1D MS**      **Lab ID: 60219054011**      Collected: 05/10/13 10:19      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>110.2 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	06/07/16 19:13	13982-63-3	
Radium-228	EPA 904.0	<b>88.8 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	06/13/16 19:34	15262-20-1	

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	95.17 %REC 14.68 RPD ± NA (NA) C:NA T:NA	pCi/L	06/07/16 19:55	13982-63-3	
Radium-228	EPA 904.0	106 %REC 18.1 RPD +/- NA (NA) C:NA T:NA	pCi/L	06/13/16 21:06	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

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QC Batch:	221102	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010, 60219054011, 60219054012		

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METHOD BLANK:	1081799	Matrix:	Water
Associated Lab Samples:	60219054001, 60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010, 60219054011, 60219054012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.069 ± 0.317 (0.748) C:NA T:92%	pCi/L	06/07/16 12:57	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

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QC Batch:	221116	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010		

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METHOD BLANK:	1081826	Matrix:	Water
Associated Lab Samples:	60219054002, 60219054003, 60219054004, 60219054005, 60219054006, 60219054007, 60219054009, 60219054010		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0584 ± 0.321 (0.762) C:77% T:83%	pCi/L	06/02/16 12:11	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

QC Batch: 222601 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60219054001, 60219054011, 60219054012

METHOD BLANK: 1088745 Matrix: Water

Associated Lab Samples: 60219054001, 60219054011, 60219054012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.554 ± 0.425 (0.838) C:82% T:77%	pCi/L	06/13/16 19:33	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

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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.

L0 Analyte recovery in the laboratory control sample (LCS) was outside QC limits.

L3 Analyte recovery in the laboratory control sample (LCS) exceeded QC limits. Analyte presence below reporting limits in associated samples.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60219054001	S-UMW-1D	EPA 200.7	430503	EPA 200.7	430607
60219054002	S-UMW-2D	EPA 200.7	430503	EPA 200.7	430607
60219054003	S-UMW-3D	EPA 200.7	430503	EPA 200.7	430607
60219054004	S-UMW-4D	EPA 200.7	430503	EPA 200.7	430607
60219054005	S-UMW-5D	EPA 200.7	430503	EPA 200.7	430607
60219054006	S-UMW-6D	EPA 200.7	430503	EPA 200.7	430607
60219054007	S-BMW-1D	EPA 200.7	430503	EPA 200.7	430607
60219054009	S-UMW-DUP-1	EPA 200.7	430503	EPA 200.7	430607
60219054010	S-UMW-FB-1	EPA 200.7	430503	EPA 200.7	430607
60219054001	S-UMW-1D	EPA 200.8	430505	EPA 200.8	430611
60219054002	S-UMW-2D	EPA 200.8	430505	EPA 200.8	430611
60219054003	S-UMW-3D	EPA 200.8	430505	EPA 200.8	430611
60219054004	S-UMW-4D	EPA 200.8	430505	EPA 200.8	430611
60219054005	S-UMW-5D	EPA 200.8	430505	EPA 200.8	430611
60219054006	S-UMW-6D	EPA 200.8	430505	EPA 200.8	430611
60219054007	S-BMW-1D	EPA 200.8	430505	EPA 200.8	430611
60219054009	S-UMW-DUP-1	EPA 200.8	430505	EPA 200.8	430611
60219054010	S-UMW-FB-1	EPA 200.8	430505	EPA 200.8	430611
60219054001	S-UMW-1D	EPA 7470	431064	EPA 7470	431138
60219054002	S-UMW-2D	EPA 7470	431064	EPA 7470	431138
60219054003	S-UMW-3D	EPA 7470	431064	EPA 7470	431138
60219054004	S-UMW-4D	EPA 7470	431064	EPA 7470	431138
60219054005	S-UMW-5D	EPA 7470	431064	EPA 7470	431138
60219054006	S-UMW-6D	EPA 7470	431064	EPA 7470	431138
60219054007	S-BMW-1D	EPA 7470	431064	EPA 7470	431138
60219054009	S-UMW-DUP-1	EPA 7470	431064	EPA 7470	431138
60219054010	S-UMW-FB-1	EPA 7470	431064	EPA 7470	431138
60219054001	S-UMW-1D	EPA 903.1	221102		
60219054002	S-UMW-2D	EPA 903.1	221102		
60219054003	S-UMW-3D	EPA 903.1	221102		
60219054004	S-UMW-4D	EPA 903.1	221102		
60219054005	S-UMW-5D	EPA 903.1	221102		
60219054006	S-UMW-6D	EPA 903.1	221102		
60219054007	S-BMW-1D	EPA 903.1	221102		
60219054009	S-UMW-DUP-1	EPA 903.1	221102		
60219054010	S-UMW-FB-1	EPA 903.1	221102		
60219054011	S-UMW-1D MS	EPA 903.1	221102		
60219054012	S-UMW-1D MSD	EPA 903.1	221102		
60219054001	S-UMW-1D	EPA 904.0	222601		
60219054002	S-UMW-2D	EPA 904.0	221116		
60219054003	S-UMW-3D	EPA 904.0	221116		
60219054004	S-UMW-4D	EPA 904.0	221116		
60219054005	S-UMW-5D	EPA 904.0	221116		
60219054006	S-UMW-6D	EPA 904.0	221116		
60219054007	S-BMW-1D	EPA 904.0	221116		
60219054009	S-UMW-DUP-1	EPA 904.0	221116		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60219054

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60219054010	S-UMW-FB-1	EPA 904.0	221116		
60219054011	S-UMW-1D MS	EPA 904.0	222601		
60219054012	S-UMW-1D MSD	EPA 904.0	222601		
60219054001	S-UMW-1D	SM 2540C	430413		
60219054002	S-UMW-2D	SM 2540C	430413		
60219054003	S-UMW-3D	SM 2540C	430413		
60219054004	S-UMW-4D	SM 2540C	430413		
60219054005	S-UMW-5D	SM 2540C	430413		
60219054006	S-UMW-6D	SM 2540C	430413		
60219054007	S-BMW-1D	SM 2540C	430413		
60219054009	S-UMW-DUP-1	SM 2540C	430619		
60219054010	S-UMW-FB-1	SM 2540C	430619		
60219054001	S-UMW-1D	SM 4500-H+B	430313		
60219054002	S-UMW-2D	SM 4500-H+B	430313		
60219054003	S-UMW-3D	SM 4500-H+B	430313		
60219054004	S-UMW-4D	SM 4500-H+B	430313		
60219054005	S-UMW-5D	SM 4500-H+B	430313		
60219054006	S-UMW-6D	SM 4500-H+B	430313		
60219054007	S-BMW-1D	SM 4500-H+B	430313		
60219054009	S-UMW-DUP-1	SM 4500-H+B	430313		
60219054010	S-UMW-FB-1	SM 4500-H+B	430313		
60219054001	S-UMW-1D	EPA 300.0	431968		
60219054001	S-UMW-1D	EPA 300.0	432356		
60219054002	S-UMW-2D	EPA 300.0	431968		
60219054002	S-UMW-2D	EPA 300.0	432356		
60219054003	S-UMW-3D	EPA 300.0	431968		
60219054003	S-UMW-3D	EPA 300.0	432356		
60219054004	S-UMW-4D	EPA 300.0	431968		
60219054004	S-UMW-4D	EPA 300.0	432356		
60219054005	S-UMW-5D	EPA 300.0	431968		
60219054005	S-UMW-5D	EPA 300.0	432356		
60219054006	S-UMW-6D	EPA 300.0	432449		
60219054007	S-BMW-1D	EPA 300.0	431968		
60219054007	S-BMW-1D	EPA 300.0	432356		
60219054009	S-UMW-DUP-1	EPA 300.0	431968		
60219054009	S-UMW-DUP-1	EPA 300.0	432356		
60219054010	S-UMW-FB-1	EPA 300.0	431968		

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**Sample Condition Upon Receipt**

**WO# : 60219054**



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

Cooler Temperature: 2.0, 14.4, 15.4  
 Temperature should be above freezing to 6°C

Date and initials of person examining contents: JSS 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 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>PM</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 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: \_\_\_\_\_  
 \_\_\_\_\_ Jami Church \_\_\_\_\_ 5/13/16 \_\_\_\_\_

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





January 02, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
Pace Project No.: 60223196

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.

REV-1, 1/2/18: Revision

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-BOTTOM

Pace Project No.: 60223196

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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-BOTTOM

Pace Project No.: 60223196

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60223196001	S-UMW-1D	Water	07/05/16 16:54	07/09/16 04:45
60223196002	S-UMW-2D	Water	07/06/16 11:53	07/09/16 04:45
60223196003	S-UMW-3D	Water	07/06/16 10:35	07/09/16 04:45
60223196004	S-UMW-4D	Water	07/06/16 09:30	07/09/16 04:45
60223196005	S-UMW-5D	Water	07/07/16 13:01	07/09/16 04:45
60223196006	S-UMW-6D	Water	07/07/16 11:59	07/09/16 04:45
60223196007	S-BMW-1D	Water	07/05/16 13:35	07/09/16 04:45
60223196009	S-UMW-DUP-1	Water	07/06/16 08:00	07/09/16 04:45
60223196010	S-UMW-FB-1	Water	07/06/16 10:01	07/09/16 04:45
60223196011	S-UMW-1D MS	Water	07/05/16 16:54	07/09/16 04:45
60223196012	S-UMW-1D MSD	Water	07/05/16 16:54	07/09/16 04:45

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60223196001	S-UMW-1D	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
60223196002	S-UMW-2D	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
60223196003	S-UMW-3D	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
60223196004	S-UMW-4D	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
60223196005	S-UMW-5D	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
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K
60223196005	S-UMW-5D	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60223196006	S-UMW-6D	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
60223196007	S-BMW-1D	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
60223196009	S-UMW-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
60223196010	S-UMW-FB-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
60223196011	S-UMW-1D MS	SM 2540C	HAC	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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**SAMPLE ANALYTE COUNT**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
Pace Project No.: 60223196

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60223196012	S-UMW-1D MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-1D**      **Lab ID: 60223196001**      Collected: 07/05/16 16:54      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>138</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:02	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:02	7440-41-7	
Boron	<b>810</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:02	7440-42-8	
Calcium	<b>68600</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:02	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:02	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:02	7439-92-1	
Lithium	<b>13.7</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:02	7439-93-2	
Molybdenum	<b>40.3</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:02	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.078J</b>	ug/L	1.0	0.058	1	07/13/16 12:10	07/21/16 17:40	7440-36-0	
Arsenic	<b>1.1</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 17:40	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 17:40	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 17:40	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 17:40	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 17:40	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 10:32	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>376</b>	mg/L	5.0	5.0	1		07/11/16 16:11		
<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		07/11/16 11:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>21.2</b>	mg/L	2.0	1.0	2		07/23/16 18:26	16887-00-6	
Fluoride	<b>0.22</b>	mg/L	0.20	0.073	1		07/20/16 19:45	16984-48-8	
Sulfate	<b>65.1</b>	mg/L	5.0	1.2	5		07/23/16 19:36	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-2D**      **Lab ID: 60223196002**      Collected: 07/06/16 11:53      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>119</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:08	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:08	7440-41-7	
Boron	<b>16800</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:08	7440-42-8	
Calcium	<b>209000</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:08	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:08	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:08	7439-92-1	
Lithium	<b>28.7</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:08	7439-93-2	
Molybdenum	<b>1360</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:08	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	07/13/16 12:10	07/21/16 17:50	7440-36-0	
Arsenic	<b>1.4</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 17:50	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 17:50	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 17:50	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 17:50	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 17:50	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 10:43	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1090</b>	mg/L	5.0	5.0	1		07/12/16 11:27		
<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		07/11/16 11:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.9</b>	mg/L	2.0	1.0	2		07/23/16 20:19	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.073	1		07/20/16 20:30	16984-48-8	
Sulfate	<b>594</b>	mg/L	50.0	12.4	50		07/23/16 20:33	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-3D**      **Lab ID: 60223196003**      Collected: 07/06/16 10:35      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>70.1</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:11	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:11	7440-41-7	
Boron	<b>24000</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:11	7440-42-8	
Calcium	<b>219000</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:11	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:11	7440-48-4	
Lead	<b>2.7J</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:11	7439-92-1	
Lithium	<b>26.0</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:11	7439-93-2	
Molybdenum	<b>3770</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:11	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	07/13/16 12:10	07/21/16 17:53	7440-36-0	
Arsenic	<b>0.44J</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 17:53	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/22/16 13:36	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 17:53	7440-47-3	
Selenium	<b>0.30J</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 17:53	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 17:53	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 10:45	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1150</b>	mg/L	5.0	5.0	1		07/12/16 11:28		
<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		07/11/16 11:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.6</b>	mg/L	2.0	1.0	2		07/23/16 20:47	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.073	1		07/20/16 20:44	16984-48-8	
Sulfate	<b>565</b>	mg/L	50.0	12.4	50		07/23/16 21:01	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-4D**      **Lab ID: 60223196004**      Collected: 07/06/16 09:30      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	83.4	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:13	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:13	7440-41-7	
Boron	26500	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:13	7440-42-8	
Calcium	178000	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:13	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:13	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:13	7439-92-1	
Lithium	37.9	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:13	7439-93-2	
Molybdenum	7550	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:13	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	07/13/16 12:10	07/21/16 17:56	7440-36-0	
Arsenic	0.27J	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 17:56	7440-38-2	
Cadmium	<0.058	ug/L	1.0	0.058	2	07/13/16 12:10	07/22/16 13:41	7440-43-9	D3
Chromium	<0.34	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 17:56	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 17:56	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 17:56	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 10:48	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	1100	mg/L	5.0	5.0	1		07/12/16 11:29		
<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		07/11/16 11:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	25.5	mg/L	2.0	1.0	2		07/23/16 21:15	16887-00-6	
Fluoride	0.86	mg/L	0.20	0.073	1		07/20/16 20:59	16984-48-8	
Sulfate	522	mg/L	50.0	12.4	50		07/23/16 21:57	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-5D**      **Lab ID: 60223196005**      Collected: 07/07/16 13:01      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	312	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:15	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:15	7440-41-7	
Boron	12900	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:15	7440-42-8	
Calcium	94600	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:15	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:15	7440-48-4	
Lead	3.0J	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:15	7439-92-1	
Lithium	29.8	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:15	7439-93-2	
Molybdenum	280	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:15	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	07/13/16 12:10	07/21/16 17:59	7440-36-0	
Arsenic	0.65J	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 17:59	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 17:59	7440-43-9	
Chromium	0.46J	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 17:59	7440-47-3	
Selenium	0.22J	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 17:59	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 17:59	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 10:54	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	461	mg/L	5.0	5.0	1		07/12/16 14:19		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.2	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	24.7	mg/L	2.0	1.0	2		07/23/16 22:12	16887-00-6	
Fluoride	0.66	mg/L	0.20	0.073	1		07/20/16 21:14	16984-48-8	
Sulfate	40.4	mg/L	5.0	1.2	5		07/23/16 22:26	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-6D**      **Lab ID: 60223196006**      Collected: 07/07/16 11:59      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>118</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:17	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:17	7440-41-7	
Boron	<b>760</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:17	7440-42-8	
Calcium	<b>76500</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:17	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:17	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:17	7439-92-1	
Lithium	<b>12.1</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:17	7439-93-2	
Molybdenum	<b>109</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:17	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	07/13/16 12:10	07/21/16 18:02	7440-36-0	
Arsenic	<b>0.32J</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 18:02	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 18:02	7440-43-9	
Chromium	<b>0.67J</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 18:02	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 18:02	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 18:02	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 10:56	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>364</b>	mg/L	5.0	5.0	1		07/12/16 14:20		
<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		07/12/16 09:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>21.7</b>	mg/L	2.0	1.0	2		07/23/16 22:40	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.073	1		07/20/16 21:28	16984-48-8	
Sulfate	<b>77.8</b>	mg/L	5.0	1.2	5		07/23/16 22:54	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-BMW-1D**      **Lab ID: 60223196007**      Collected: 07/05/16 13:35      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>261</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:24	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:24	7440-41-7	
Boron	<b>236</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:24	7440-42-8	
Calcium	<b>121000</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:24	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:24	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:24	7439-92-1	
Lithium	<b>12.8</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:24	7439-93-2	
Molybdenum	<b>1.1J</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:24	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	07/13/16 12:10	07/21/16 18:12	7440-36-0	
Arsenic	<b>0.17J</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 18:12	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 18:12	7440-43-9	
Chromium	<b>0.35J</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 18:12	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 18:12	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 18:12	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 10:59	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>475</b>	mg/L	5.0	5.0	1		07/11/16 16:12		
<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>5.8</b>	mg/L	1.0	0.50	1		07/20/16 21:43	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.073	1		07/20/16 21:43	16984-48-8	
Sulfate	<b>41.1</b>	mg/L	5.0	1.2	5		07/23/16 23:08	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-DUP-1**      **Lab ID: 60223196009**      Collected: 07/06/16 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>118</b>	ug/L	10.0	0.58	1	07/13/16 12:10	07/15/16 17:28	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:28	7440-41-7	
Boron	<b>17000</b>	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:28	7440-42-8	
Calcium	<b>216000</b>	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:28	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:28	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:28	7439-92-1	
Lithium	<b>26.3</b>	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:28	7439-93-2	
Molybdenum	<b>1360</b>	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:28	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	07/13/16 12:10	07/21/16 18:18	7440-36-0	
Arsenic	<b>1.4</b>	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 18:18	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 18:18	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 18:18	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 18:18	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 18:18	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	07/11/16 16:00	07/12/16 11:08	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1090</b>	mg/L	5.0	5.0	1		07/12/16 11:30		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</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>19.7</b>	mg/L	2.0	1.0	2		07/23/16 23:50	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.073	1		07/20/16 22:42	16984-48-8	
Sulfate	<b>595</b>	mg/L	50.0	12.4	50		07/24/16 00:04	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-FB-1**      **Lab ID: 60223196010**      Collected: 07/06/16 10:01      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	07/13/16 12:10	07/15/16 17:31	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	07/13/16 12:10	07/15/16 17:31	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	07/13/16 12:10	07/15/16 17:31	7440-42-8	
Calcium	50.1J	ug/L	100	8.1	1	07/13/16 12:10	07/15/16 17:31	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	07/13/16 12:10	07/15/16 17:31	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	07/13/16 12:10	07/15/16 17:31	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	07/13/16 12:10	07/15/16 17:31	7439-93-2	
Molybdenum	0.85J	ug/L	20.0	0.52	1	07/13/16 12:10	07/15/16 17:31	7439-98-7	B
<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	07/13/16 12:10	07/21/16 18:21	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	07/13/16 12:10	07/21/16 18:21	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	07/13/16 12:10	07/21/16 18:21	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	07/13/16 12:10	07/21/16 18:21	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	07/13/16 12:10	07/21/16 18:21	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	07/13/16 12:10	07/21/16 18:21	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 11:10	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		07/12/16 11:31		
<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		07/11/16 11:40		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 22:57	16887-00-6	
Fluoride	<0.073	mg/L	0.20	0.073	1		07/20/16 22:57	16984-48-8	
Sulfate	<0.25	mg/L	1.0	0.25	1		07/20/16 22:57	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

QC Batch: 438034 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004

METHOD BLANK: 1791509 Matrix: Water  
 Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004

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		60223195002		60223195003		60223195004		% 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.				
Mercury	ug/L	<0.039	5	5	4.8	5.0	96	101	75-125	5	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1791513 1791514

Parameter	Units	60223196001		60223196002		60223196003		60223196004		% 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.				
Mercury	ug/L	<0.039	5	5	5.3	5.8	106	115	75-125	9	20		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

QC Batch: 438036

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60223196005, 60223196006, 60223196007, 60223196009, 60223196010

METHOD BLANK: 1791515

Matrix: Water

Associated Lab Samples: 60223196005, 60223196006, 60223196007, 60223196009, 60223196010

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		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	5.1	4.9	102	98	75-125	4	20			

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
 Pace Project No.: 60223196

QC Batch: 438289 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010

METHOD BLANK: 1792560 Matrix: Water  
 Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010

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	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60223196001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
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-BOTTOM

Pace Project No.: 60223196

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-BOTTOM

Pace Project No.: 60223196

QC Batch:	438290	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010		

METHOD BLANK:	1792566	Matrix:	Water
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010		

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		60223196002		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
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		60223199003		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MSD Result								
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		

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

Parameter	Units	60223199002		1792570		1792571		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
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			
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-BOTTOM

Pace Project No.: 60223196

QC Batch: 438032

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60223196001, 60223196007

METHOD BLANK: 1791505

Matrix: Water

Associated Lab Samples: 60223196001, 60223196007

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-BOTTOM

Pace Project No.: 60223196

QC Batch: 438068

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60223196002, 60223196003, 60223196004, 60223196009, 60223196010

METHOD BLANK: 1791594

Matrix: Water

Associated Lab Samples: 60223196002, 60223196003, 60223196004, 60223196009, 60223196010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/12/16 11:26	

LABORATORY CONTROL SAMPLE: 1791595

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

SAMPLE DUPLICATE: 1791596

Parameter	Units	60222988001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	767	771	1	10	

SAMPLE DUPLICATE: 1791597

Parameter	Units	60222988005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	365	368	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

QC Batch: 438069 Analysis Method: SM 2540C  
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids  
 Associated Lab Samples: 60223196005, 60223196006

METHOD BLANK: 1791598 Matrix: Water

Associated Lab Samples: 60223196005, 60223196006

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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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

QC Batch: 437868 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004, 60223196007, 60223196009, 60223196010

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-BOTTOM

Pace Project No.: 60223196

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

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

Associated Lab Samples: 60223196005, 60223196006

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-BOTTOM

Pace Project No.: 60223196

QC Batch:	439323	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010		

METHOD BLANK: 1796773 Matrix: Water  
Associated Lab Samples: 60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010

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	
Sulfate	mg/L	<0.15	1.0	0.15	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	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1796775 1796776

Parameter	Units	60223196001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.22	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-BOTTOM

Pace Project No.: 60223196

QC Batch:	439703	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009		

METHOD BLANK:	1798953	Matrix:	Water
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	07/23/16 17:58	
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
Chloride	mg/L	10	9.7	97	90-110	
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	
Chloride	mg/L	21.2	10	10	30.5	30.1	93	89	80-120	1	15		
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				
Chloride	mg/L		7.5	31.2							
Sulfate	mg/L		36.5	25	61.0	98	80-120				

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-1D**      **Lab ID: 60223196001**      Collected: 07/05/16 16:54      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>0.0581 ± 0.410 (0.819)</b> C:NA T:92%	pCi/L	08/05/16 00:27	13982-63-3	
Radium-228	EPA 904.0	<b>1.22 ± 0.447 (0.651)</b> C:75% T:83%	pCi/L	08/01/16 21:17	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.226 ± 0.444 (0.797)</b> C:NA T:94%	pCi/L	08/05/16 01:07	13982-63-3	
Radium-228	EPA 904.0	<b>1.48 ± 0.488 (0.664)</b> C:78% T:80%	pCi/L	08/01/16 21:17	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-3D**      **Lab ID: 60223196003**      Collected: 07/06/16 10:35      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 ± 0.396 (0.801)</b> C:NA T:96%	pCi/L	08/05/16 00:53	13982-63-3	
Radium-228	EPA 904.0	<b>1.24 ± 0.454 (0.654)</b> C:75% T:80%	pCi/L	08/01/16 21:17	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-4D**      **Lab ID: 60223196004**      Collected: 07/06/16 09:30      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>0.0561 ± 0.256 (0.413)</b> C:NA T:91%	pCi/L	08/05/16 00:30	13982-63-3	
Radium-228	EPA 904.0	<b>1.34 ± 0.448 (0.586)</b> C:74% T:82%	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-5D**      **Lab ID: 60223196005**      Collected: 07/07/16 13:01      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>0.0523 ± 0.239 (0.485)</b> C:NA T:97%	pCi/L	08/05/16 00:54	13982-63-3	
Radium-228	EPA 904.0	<b>1.05 ± 0.407 (0.619)</b> C:77% T:87%	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-6D**      **Lab ID: 60223196006**      Collected: 07/07/16 11:59      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>0.0536 ± 0.245 (0.394)</b> C:NA T:94%	pCi/L	08/05/16 00:53	13982-63-3	
Radium-228	EPA 904.0	<b>0.683 ± 0.377 (0.676)</b> C:75% T:83%	pCi/L	08/01/16 21:18	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

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**Sample: S-BMW-1D**      **Lab ID: 60223196007**      Collected: 07/05/16 13:35      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>0.213 ± 0.443 (0.799)</b> C:NA T:94%	pCi/L	08/05/16 01:19	13982-63-3	
Radium-228	EPA 904.0	<b>1.07 ± 0.406 (0.606)</b> C:78% T:86%	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-DUP-1**      **Lab ID: 60223196009**      Collected: 07/06/16 08:00      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>0.185 ± 0.363 (0.664)</b> C:NA T:90%	pCi/L	08/04/16 11:34	13982-63-3	
Radium-228	EPA 904.0	<b>0.588 ± 0.332 (0.589)</b> C:80% T:81%	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-FB-1**      **Lab ID: 60223196010**      Collected: 07/06/16 10:01      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>0.124 ± 0.284 (0.168)</b> <b>C:NA T:93%</b>	pCi/L	08/04/16 11:59	13982-63-3	
Radium-228	EPA 904.0	<b>0.661 ± 0.356 (0.631)</b> <b>C:77% T:88%</b>	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-1D MS**      **Lab ID: 60223196011**      Collected: 07/05/16 16:54      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>91.0 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	08/05/16 01:00	13982-63-3	
Radium-228	EPA 904.0	<b>82.1 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	08/01/16 21:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

**Sample: S-UMW-1D MSD**      **Lab ID: 60223196012**      Collected: 07/05/16 16:54      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>92.7 %REC</b> <b>NA (NA)</b> <b>C:NA T:NA</b>	<b>1.80 RPD +/-</b>	pCi/L	08/05/16 01:13	13982-63-3
Radium-228	EPA 904.0	<b>96.7 %REC</b> <b>NA (NA)</b> <b>C:NA T:NA</b>	<b>16.3 RPD +/-</b>	pCi/L	08/01/16 21:19	15262-20-1

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

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QC Batch:	227042	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010, 60223196011, 60223196012		

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METHOD BLANK:	1112344	Matrix:	Water
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196009, 60223196010, 60223196011, 60223196012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.103 ± 0.284 (0.621) C:80% T:82%	pCi/L	08/01/16 21:16	

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-BOTTOM

Pace Project No.: 60223196

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QC Batch:	227063	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196011, 60223196012		

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METHOD BLANK:	1112380	Matrix:	Water
Associated Lab Samples:	60223196001, 60223196002, 60223196003, 60223196004, 60223196005, 60223196006, 60223196007, 60223196011, 60223196012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.266 (0.429) C:NA T:98%	pCi/L	08/04/16 23:51	

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-BOTTOM

Pace Project No.: 60223196

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QC Batch:	227765	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60223196009, 60223196010		

---

METHOD BLANK: 1115869 Matrix: Water

Associated Lab Samples: 60223196009, 60223196010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.210 ± 0.320 (0.840) C:NA T:85%	pCi/L	08/03/16 11:54	

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-BOTTOM

Pace Project No.: 60223196

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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.

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

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-BOTTOM

Pace Project No.: 60223196

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60223196001	S-UMW-1D	EPA 200.7	438289	EPA 200.7	438335
60223196002	S-UMW-2D	EPA 200.7	438289	EPA 200.7	438335
60223196003	S-UMW-3D	EPA 200.7	438289	EPA 200.7	438335
60223196004	S-UMW-4D	EPA 200.7	438289	EPA 200.7	438335
60223196005	S-UMW-5D	EPA 200.7	438289	EPA 200.7	438335
60223196006	S-UMW-6D	EPA 200.7	438289	EPA 200.7	438335
60223196007	S-BMW-1D	EPA 200.7	438289	EPA 200.7	438335
60223196009	S-UMW-DUP-1	EPA 200.7	438289	EPA 200.7	438335
60223196010	S-UMW-FB-1	EPA 200.7	438289	EPA 200.7	438335
60223196001	S-UMW-1D	EPA 200.8	438290	EPA 200.8	438336
60223196002	S-UMW-2D	EPA 200.8	438290	EPA 200.8	438336
60223196003	S-UMW-3D	EPA 200.8	438290	EPA 200.8	438336
60223196004	S-UMW-4D	EPA 200.8	438290	EPA 200.8	438336
60223196005	S-UMW-5D	EPA 200.8	438290	EPA 200.8	438336
60223196006	S-UMW-6D	EPA 200.8	438290	EPA 200.8	438336
60223196007	S-BMW-1D	EPA 200.8	438290	EPA 200.8	438336
60223196009	S-UMW-DUP-1	EPA 200.8	438290	EPA 200.8	438336
60223196010	S-UMW-FB-1	EPA 200.8	438290	EPA 200.8	438336
60223196001	S-UMW-1D	EPA 7470	438034	EPA 7470	438049
60223196002	S-UMW-2D	EPA 7470	438034	EPA 7470	438049
60223196003	S-UMW-3D	EPA 7470	438034	EPA 7470	438049
60223196004	S-UMW-4D	EPA 7470	438034	EPA 7470	438049
60223196005	S-UMW-5D	EPA 7470	438036	EPA 7470	438050
60223196006	S-UMW-6D	EPA 7470	438036	EPA 7470	438050
60223196007	S-BMW-1D	EPA 7470	438036	EPA 7470	438050
60223196009	S-UMW-DUP-1	EPA 7470	438036	EPA 7470	438050
60223196010	S-UMW-FB-1	EPA 7470	438036	EPA 7470	438050
60223196001	S-UMW-1D	EPA 903.1	227063		
60223196002	S-UMW-2D	EPA 903.1	227063		
60223196003	S-UMW-3D	EPA 903.1	227063		
60223196004	S-UMW-4D	EPA 903.1	227063		
60223196005	S-UMW-5D	EPA 903.1	227063		
60223196006	S-UMW-6D	EPA 903.1	227063		
60223196007	S-BMW-1D	EPA 903.1	227063		
60223196009	S-UMW-DUP-1	EPA 903.1	227765		
60223196010	S-UMW-FB-1	EPA 903.1	227765		
60223196011	S-UMW-1D MS	EPA 903.1	227063		
60223196012	S-UMW-1D MSD	EPA 903.1	227063		
60223196001	S-UMW-1D	EPA 904.0	227042		
60223196002	S-UMW-2D	EPA 904.0	227042		
60223196003	S-UMW-3D	EPA 904.0	227042		
60223196004	S-UMW-4D	EPA 904.0	227042		
60223196005	S-UMW-5D	EPA 904.0	227042		
60223196006	S-UMW-6D	EPA 904.0	227042		
60223196007	S-BMW-1D	EPA 904.0	227042		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60223196009	S-UMW-DUP-1	EPA 904.0	227042		
60223196010	S-UMW-FB-1	EPA 904.0	227042		
60223196011	S-UMW-1D MS	EPA 904.0	227042		
60223196012	S-UMW-1D MSD	EPA 904.0	227042		
60223196001	S-UMW-1D	SM 2540C	438032		
60223196002	S-UMW-2D	SM 2540C	438068		
60223196003	S-UMW-3D	SM 2540C	438068		
60223196004	S-UMW-4D	SM 2540C	438068		
60223196005	S-UMW-5D	SM 2540C	438069		
60223196006	S-UMW-6D	SM 2540C	438069		
60223196007	S-BMW-1D	SM 2540C	438032		
60223196009	S-UMW-DUP-1	SM 2540C	438068		
60223196010	S-UMW-FB-1	SM 2540C	438068		
60223196001	S-UMW-1D	SM 4500-H+B	437868		
60223196002	S-UMW-2D	SM 4500-H+B	437868		
60223196003	S-UMW-3D	SM 4500-H+B	437868		
60223196004	S-UMW-4D	SM 4500-H+B	437868		
60223196005	S-UMW-5D	SM 4500-H+B	437870		
60223196006	S-UMW-6D	SM 4500-H+B	437870		
60223196007	S-BMW-1D	SM 4500-H+B	437868		
60223196009	S-UMW-DUP-1	SM 4500-H+B	437868		
60223196010	S-UMW-FB-1	SM 4500-H+B	437868		
60223196001	S-UMW-1D	EPA 300.0	439323		
60223196001	S-UMW-1D	EPA 300.0	439703		
60223196002	S-UMW-2D	EPA 300.0	439323		
60223196002	S-UMW-2D	EPA 300.0	439703		
60223196003	S-UMW-3D	EPA 300.0	439323		
60223196003	S-UMW-3D	EPA 300.0	439703		
60223196004	S-UMW-4D	EPA 300.0	439323		
60223196004	S-UMW-4D	EPA 300.0	439703		
60223196005	S-UMW-5D	EPA 300.0	439323		
60223196005	S-UMW-5D	EPA 300.0	439703		
60223196006	S-UMW-6D	EPA 300.0	439323		
60223196006	S-UMW-6D	EPA 300.0	439703		
60223196007	S-BMW-1D	EPA 300.0	439323		
60223196007	S-BMW-1D	EPA 300.0	439703		
60223196009	S-UMW-DUP-1	EPA 300.0	439323		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60223196

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Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60223196009	S-UMW-DUP-1	EPA 300.0	439703		
60223196010	S-UMW-FB-1	EPA 300.0	439323		

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Sample Condition Upon Receipt

WO#: 60223196



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: 18 25.6

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 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>W</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: Jamie Church Date: 7/11/16





January 12, 2018

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOT  
Pace Project No.: 60227900

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between September 16, 2016 and October 21, 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.

Due to Lab Error sample S-BMW-1D required recollection for anions.

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-BOT

Pace Project No.: 60227900

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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-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60227403018	S-UMW-1D	Water	09/15/16 15:25	09/16/16 04:30
60227403019	S-UMW-2D	Water	09/14/16 15:50	09/16/16 04:30
60227403021	S-UMW-4D	Water	09/14/16 14:33	09/16/16 04:30
60227403022	S-BMW-1D	Water	09/14/16 13:13	09/16/16 04:30
60227403023	S-UMW-DUP-1	Water	09/14/16 08:00	09/16/16 04:30
60227403020	S-UMW-3D	Water	09/14/16 14:22	09/16/16 04:30
60227900008	S-UMW-FB-1	Water	09/14/16 14:15	09/16/16 04:30
60227900009	S-UMW-5D	Water	09/16/16 09:55	09/16/16 20:45
60227900010	S-UMW-6D	Water	09/16/16 10:35	09/16/16 20:45
60227900011	S-UMW-5D MS	Water	09/16/16 09:55	09/16/16 20:45
60227900012	S-UMW-5D MSD	Water	09/16/16 09:55	09/16/16 20:45
60227900013	S-BMW-1D	Water	10/20/16 10:17	10/21/16 03:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60227403018	S-UMW-1D	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	JMC1	1	PASI-K
		SM 4500-H+B	LDB	1	PASI-K
60227403019	S-UMW-2D	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
60227403021	S-UMW-4D	SM 4500-H+B	HAC	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
60227403022	S-BMW-1D	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HAC	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
60227403023	S-UMW-DUP-1	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	NDJ	1	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60227403020	S-UMW-3D	SM 4500-H+B	HAC	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	JSS	1	PASI-K
60227900008	S-UMW-FB-1	SM 4500-H+B	HAC	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	JSS	1	PASI-K
60227900009	S-UMW-5D	SM 4500-H+B	HAC	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		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	JMC1	1	PASI-K
60227900010	S-UMW-6D	SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		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	JMC1	1	PASI-K
60227900011	S-UMW-5D MS	SM 4500-H+B	LDB	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60227900012	S-UMW-5D MSD	EPA 903.1	WRR	1	PASI-PA

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**SAMPLE ANALYTE COUNT**

Project: AMEREN SIOUX ENERGY CTR-BOT  
Pace Project No.: 60227900

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60227900013	S-BMW-1D	EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-1D**      **Lab ID: 60227403018**      Collected: 09/15/16 15:25      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>195</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:23	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:23	7440-41-7	
Boron	<b>318</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:23	7440-42-8	
Calcium	<b>99000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:23	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:23	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:23	7439-92-1	
Lithium	<b>14.2</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:23	7439-93-2	
Molybdenum	<b>27.9</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:23	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.066J</b>	ug/L	1.0	0.058	1	09/19/16 16:10	09/29/16 19:24	7440-36-0	
Arsenic	<b>0.98J</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:24	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:24	7440-43-9	
Chromium	<b>0.36J</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:24	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:24	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:24	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 13:43	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>588</b>	mg/L	5.0	5.0	1		09/22/16 16:59		
<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		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>23.2</b>	mg/L	2.0	1.0	2		10/10/16 00:42	16887-00-6	
Fluoride	<b>0.19J</b>	mg/L	0.20	0.027	1		10/08/16 17:08	16984-48-8	
Sulfate	<b>213</b>	mg/L	20.0	3.1	20		10/10/16 00:56	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-2D**      **Lab ID: 60227403019**      Collected: 09/14/16 15:50      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>105</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:25	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:25	7440-41-7	
Boron	<b>14700</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:25	7440-42-8	
Calcium	<b>192000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:25	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:25	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:25	7439-92-1	
Lithium	<b>28.0</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:25	7439-93-2	
Molybdenum	<b>1270</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:25	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 16:10	09/29/16 19:27	7440-36-0	
Arsenic	<b>1.3</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:27	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:27	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:27	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:27	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	09/20/16 08:30	09/20/16 13:45	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1010</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>8.1</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>19.7</b>	mg/L	2.0	1.0	2		10/10/16 01:11	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.027	1		10/08/16 17:22	16984-48-8	
Sulfate	<b>528</b>	mg/L	50.0	7.7	50		10/10/16 01:53	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-4D**      **Lab ID: 60227403021**      Collected: 09/14/16 14:33      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>81.2</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:29	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:29	7440-41-7	
Boron	<b>24100</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:29	7440-42-8	
Calcium	<b>176000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:29	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:29	7440-48-4	
Lead	<b>6.3</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:29	7439-92-1	
Lithium	<b>38.0</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:29	7439-93-2	
Molybdenum	<b>7200</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:29	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 16:10	09/29/16 19:33	7440-36-0	
Arsenic	<b>0.20J</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:33	7440-38-2	
Cadmium	<b>0.45J</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:33	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:33	7440-47-3	
Selenium	<b>0.27J</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:33	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:33	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	09/20/16 08:30	09/20/16 14:05	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1110</b>	mg/L	5.0	5.0	1		09/21/16 16:02		
<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>24.7</b>	mg/L	2.0	1.0	2		10/10/16 02:36	16887-00-6	
Fluoride	<b>0.84</b>	mg/L	0.20	0.027	1		10/08/16 17:51	16984-48-8	
Sulfate	<b>624</b>	mg/L	50.0	7.7	50		10/10/16 02:50	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-BMW-1D**      **Lab ID: 60227403022**      Collected: 09/14/16 13:13      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>309</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:32	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:32	7440-41-7	
Boron	<b>240</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:32	7440-42-8	
Calcium	<b>123000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:32	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:32	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:32	7439-92-1	
Lithium	<b>12.9</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:32	7439-93-2	
Molybdenum	<b>6.4J</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:32	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	09/19/16 16:10	09/29/16 19:36	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:36	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:36	7440-43-9	
Chromium	<b>0.41J</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:36	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:36	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:36	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	09/20/16 08:30	09/20/16 14:07	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		09/21/16 16:03		
<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		09/23/16 11:25		H6

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-DUP-1**      **Lab ID: 60227403023**      Collected: 09/14/16 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>102</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:39	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:39	7440-41-7	
Boron	<b>14200</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:39	7440-42-8	
Calcium	<b>188000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:39	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:39	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:39	7439-92-1	
Lithium	<b>28.1</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:39	7439-93-2	
Molybdenum	<b>1250</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:39	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 16:10	09/29/16 19:39	7440-36-0	
Arsenic	<b>1.4</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:39	7440-38-2	
Cadmium	<b>0.061J</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:39	7440-43-9	
Chromium	<b>0.77J</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:39	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:39	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:39	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 14:10	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>978</b>	mg/L	5.0	5.0	1		09/21/16 16:04		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.0</b>	Std. Units	0.10	0.10	1		09/20/16 10:55		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>20.1</b>	mg/L	2.0	1.0	2		10/10/16 03:04	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.027	1		10/08/16 18:05	16984-48-8	
Sulfate	<b>516</b>	mg/L	50.0	7.7	50		10/10/16 03:18	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-3D**      **Lab ID: 60227403020**      Collected: 09/14/16 14:22      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>71.8</b>	ug/L	10.0	0.58	1	09/19/16 16:10	09/20/16 15:27	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:27	7440-41-7	
Boron	<b>25200</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:27	7440-42-8	
Calcium	<b>220000</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:27	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:27	7440-48-4	
Lead	<b>3.1J</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:27	7439-92-1	
Lithium	<b>18.4</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:27	7439-93-2	
Molybdenum	<b>4280</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:27	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 16:10	09/29/16 19:30	7440-36-0	
Arsenic	<b>0.29J</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:30	7440-38-2	
Cadmium	<b>0.25J</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:30	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:30	7440-47-3	
Selenium	<b>0.30J</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:30	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:30	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 13:59	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1170</b>	mg/L	5.0	5.0	1		09/21/16 16:02		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</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>22.4</b>	mg/L	2.0	1.0	2		10/10/16 02:07	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.027	1		10/08/16 17:36	16984-48-8	
Sulfate	<b>684</b>	mg/L	50.0	7.7	50		10/10/16 02:21	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-FB-1**      **Lab ID: 60227900008**      Collected: 09/14/16 14:15      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 16:10	09/20/16 15:41	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:41	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:41	7440-42-8	
Calcium	34.0J	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:41	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:41	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:41	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:41	7439-93-2	
Molybdenum	1.2J	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:41	7439-98-7	B
<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 16:10	09/29/16 19:55	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:55	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:55	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:55	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:55	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:55	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 14:12	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		09/21/16 16:04		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	6.0	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	<0.50	mg/L	1.0	0.50	1		10/08/16 18:19	16887-00-6	
Fluoride	<0.027	mg/L	0.20	0.027	1		10/08/16 18:19	16984-48-8	
Sulfate	<0.15	mg/L	1.0	0.15	1		10/08/16 18:19	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-5D**      **Lab ID: 60227900009**      Collected: 09/16/16 09:55      Received: 09/16/16 20:45      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>300</b>	ug/L	5.0	0.58	1	09/19/16 16:10	09/20/16 15:50	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:50	7440-41-7	
Boron	<b>11400</b>	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:50	7440-42-8	
Calcium	<b>90400</b>	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:50	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:50	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:50	7439-92-1	
Lithium	<b>31.0</b>	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:50	7439-93-2	
Molybdenum	<b>259</b>	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:50	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	09/19/16 16:10	09/29/16 20:02	7440-36-0	
Arsenic	<b>0.51J</b>	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 20:02	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 20:02	7440-43-9	
Chromium	<b>0.64J</b>	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 20:02	7440-47-3	
Selenium	<b>0.20J</b>	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 20:02	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 20:02	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 14:23	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		09/23/16 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		09/25/16 20:20		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.5</b>	mg/L	2.0	1.0	2		10/09/16 10:33	16887-00-6	
Fluoride	<b>0.63</b>	mg/L	0.20	0.027	1		10/08/16 19:47	16984-48-8	
Sulfate	<b>38.6</b>	mg/L	5.0	0.77	5		10/09/16 11:16	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-6D**      **Lab ID: 60227900010**      Collected: 09/16/16 10:35      Received: 09/16/16 20:45      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	117	ug/L	5.0	0.58	1	09/19/16 16:10	09/20/16 15:43	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	09/19/16 16:10	09/20/16 15:43	7440-41-7	
Boron	802	ug/L	100	50.0	1	09/19/16 16:10	09/20/16 15:43	7440-42-8	
Calcium	74100	ug/L	100	8.1	1	09/19/16 16:10	09/20/16 15:43	7440-70-2	M1
Cobalt	<0.72	ug/L	5.0	0.72	1	09/19/16 16:10	09/20/16 15:43	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	09/19/16 16:10	09/20/16 15:43	7439-92-1	
Lithium	12.0	ug/L	10.0	4.9	1	09/19/16 16:10	09/20/16 15:43	7439-93-2	
Molybdenum	112	ug/L	20.0	0.52	1	09/19/16 16:10	09/20/16 15:43	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 16:10	09/29/16 19:42	7440-36-0	
Arsenic	0.34J	ug/L	1.0	0.10	1	09/19/16 16:10	09/29/16 19:42	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	09/19/16 16:10	09/29/16 19:42	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	09/19/16 16:10	09/29/16 19:42	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	09/19/16 16:10	09/29/16 19:42	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	09/19/16 16:10	09/29/16 19:42	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 14:16	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	347	mg/L	5.0	5.0	1		09/23/16 10:55		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.3	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	20.8	mg/L	2.0	1.0	2		10/09/16 15:02	16887-00-6	
Fluoride	0.44	mg/L	0.20	0.027	1		10/08/16 21:19	16984-48-8	
Sulfate	80.2	mg/L	5.0	0.77	5		10/09/16 15:16	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

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**Sample: S-BMW-1D**      **Lab ID: 60227900013**      Collected: 10/20/16 10:17      Received: 10/21/16 03:50      Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.9</b>	mg/L	1.0	0.50	1		11/03/16 03:05	16887-00-6	
Fluoride	<b>0.32</b>	mg/L	0.20	0.027	1		11/03/16 03:05	16984-48-8	
Sulfate	<b>41.6</b>	mg/L	5.0	0.77	5		11/03/16 10:11	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 447159 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60227403018, 60227403019

METHOD BLANK: 1828989 Matrix: Water  
 Associated Lab Samples: 60227403018, 60227403019

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

LABORATORY CONTROL SAMPLE: 1828990

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: 1828991 1828992

Parameter	Units	60227580011		1828991		1828992		% 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	4.8	4.3	96	87	75-125	10	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 447160 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010

METHOD BLANK: 1828993 Matrix: Water  
 Associated Lab Samples: 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	09/20/16 13:47	

LABORATORY CONTROL SAMPLE: 1828994

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: 1828995 1828996

Parameter	Units	60227900010 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	4.0	3.9	79	78	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828997 1828998

Parameter	Units	60227901011 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	4.6	104	92	75-125	12	20	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT  
 Pace Project No.: 60227900

QC Batch: 447059 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010

METHOD BLANK: 1828808 Matrix: Water  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	09/20/16 15:20	
Beryllium	ug/L	<0.26	1.0	0.26	09/20/16 15:20	
Boron	ug/L	<50.0	100	50.0	09/20/16 15:20	
Calcium	ug/L	<8.1	100	8.1	09/20/16 15:20	
Cobalt	ug/L	<0.72	5.0	0.72	09/20/16 15:20	
Lead	ug/L	<2.5	5.0	2.5	09/20/16 15:20	
Lithium	ug/L	<4.9	10.0	4.9	09/20/16 15:20	
Molybdenum	ug/L	1.0J	20.0	0.52	09/20/16 15:20	

LABORATORY CONTROL SAMPLE: 1828809

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1020	102	85-115	
Beryllium	ug/L	1000	995	100	85-115	
Boron	ug/L	1000	983	98	85-115	
Calcium	ug/L	10000	9750	97	85-115	
Cobalt	ug/L	1000	1030	103	85-115	
Lead	ug/L	1000	1030	103	85-115	
Lithium	ug/L	1000	994	99	85-115	
Molybdenum	ug/L	1000	1070	107	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828810 1828811

Parameter	Units	60227900010		1828810		1828811		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Result							
Barium	ug/L	117	1000	1000	1120	1130	100	101	70-130	1	20			
Beryllium	ug/L	<0.26	1000	1000	986	1000	99	100	70-130	2	20			
Boron	ug/L	802	1000	1000	1740	1770	94	97	70-130	2	20			
Calcium	ug/L	74100	10000	10000	81000	82200	69	81	70-130	2	20	M1		
Cobalt	ug/L	<0.72	1000	1000	991	1000	99	100	70-130	1	20			
Lead	ug/L	<2.5	1000	1000	993	1010	99	101	70-130	2	20			
Lithium	ug/L	12.0	1000	1000	1010	1030	100	101	70-130	1	20			
Molybdenum	ug/L	112	1000	1000	1160	1180	105	107	70-130	1	20			

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Parameter	Units	1828812		1828813		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60227901011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Barium	ug/L	99.4	1000	1000	1110	1120	101	102	70-130	1	20	
Beryllium	ug/L	<0.26	1000	1000	994	997	99	100	70-130	0	20	
Boron	ug/L	5660	1000	1000	6380	6600	73	94	70-130	3	20	
Calcium	ug/L	152000	10000	10000	157000	163000	52	108	70-130	4	20	M1
Cobalt	ug/L	4.1J	1000	1000	1000	1010	100	100	70-130	0	20	
Lead	ug/L	<2.5	1000	1000	994	998	99	100	70-130	0	20	
Lithium	ug/L	20.6	1000	1000	1040	1050	102	103	70-130	1	20	
Molybdenum	ug/L	124	1000	1000	1200	1210	108	109	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch:	447060	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010		

METHOD BLANK:	1828814	Matrix:	Water
Associated Lab Samples:	60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900010		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.058	1.0	0.058	09/29/16 19:17	
Arsenic	ug/L	<0.10	1.0	0.10	09/29/16 19:17	
Cadmium	ug/L	<0.029	0.50	0.029	09/29/16 19:17	
Chromium	ug/L	<0.34	1.0	0.34	09/29/16 19:17	
Selenium	ug/L	<0.18	1.0	0.18	09/29/16 19:17	
Thallium	ug/L	<0.50	1.0	0.50	09/29/16 19:17	

LABORATORY CONTROL SAMPLE: 1828815

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.6	102	85-115	
Arsenic	ug/L	40	40.9	102	85-115	
Cadmium	ug/L	40	40.5	101	85-115	
Chromium	ug/L	40	41.2	103	85-115	
Selenium	ug/L	40	40.2	101	85-115	
Thallium	ug/L	40	38.4	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828816 1828817

Parameter	Units	60227900010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	<0.058	40	40	40.2	41.3	101	103	70-130	3	20	
Arsenic	ug/L	0.34J	40	40	40.4	41.5	100	103	70-130	3	20	
Cadmium	ug/L	<0.029	40	40	39.7	39.5	99	99	70-130	1	20	
Chromium	ug/L	<0.34	40	40	40.7	41.2	101	102	70-130	1	20	
Selenium	ug/L	<0.18	40	40	37.8	39.3	94	98	70-130	4	20	
Thallium	ug/L	<0.50	40	40	39.8	40.1	100	100	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1828818 1828819

Parameter	Units	60227901011 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.19J	40	40	40.8	40.2	101	100	70-130	1	20	
Arsenic	ug/L	1.1	40	40	43.9	43.0	107	105	70-130	2	20	
Cadmium	ug/L	0.082J	40	40	38.6	38.8	96	97	70-130	0	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Parameter	Units	60227901011		1828818		1828819		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Chromium	ug/L	0.46J	40	40	42.9	41.8	106	103	70-130	3	20			
Selenium	ug/L	<0.18	40	40	38.6	39.6	96	99	70-130	2	20			
Thallium	ug/L	<0.50	40	40	41.4	41.6	103	104	70-130	0	20			

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 447478

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008

METHOD BLANK: 1830494

Matrix: Water

Associated Lab Samples: 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008

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	

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	

SAMPLE DUPLICATE: 1830496

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

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 CTR-BOT

Pace Project No.: 60227900

QC Batch: 447623	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60227403018	

METHOD BLANK: 1831074 Matrix: Water  
Associated Lab Samples: 60227403018

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	09/22/16 16:57	

LABORATORY CONTROL SAMPLE: 1831075

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

SAMPLE DUPLICATE: 1831076

Parameter	Units	60227881007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	996	1010	1	10	

SAMPLE DUPLICATE: 1831116

Parameter	Units	60227637016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	824	863	5	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 447630

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60227900009, 60227900010

METHOD BLANK: 1831112

Matrix: Water

Associated Lab Samples: 60227900009, 60227900010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	09/23/16 10:54	

LABORATORY CONTROL SAMPLE: 1831113

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

SAMPLE DUPLICATE: 1831114

Parameter	Units	60227900009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	436	443	2	10	

SAMPLE DUPLICATE: 1831115

Parameter	Units	60227901011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	822	842	2	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 447131 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60227403023

SAMPLE DUPLICATE: 1828952

Parameter	Units	60227704003 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.0	8.0	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

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

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

Associated Lab Samples: 60227403019, 60227403020, 60227403021, 60227403022, 60227900008

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 CTR-BOT

Pace Project No.: 60227900

QC Batch: 447880 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60227403018, 60227900009, 60227900010

SAMPLE DUPLICATE: 1832509

Parameter	Units	60227900009 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.4	7.4	0	5	H6

SAMPLE DUPLICATE: 1832510

Parameter	Units	60227901011 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-BOT

Pace Project No.: 60227900

QC Batch: 449693	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60227900010	

METHOD BLANK: 1840299 Matrix: Water  
Associated Lab Samples: 60227900010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.027	0.20	0.027	10/08/16 09:13	

LABORATORY CONTROL SAMPLE: 1840300

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840301 1840302

Parameter	Units	60228562001		1840301		1840302		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	0.22	2.5	2.5	2.8	2.8	102	101	80-120	0	15

MATRIX SPIKE SAMPLE: 1840303

Parameter	Units	60228563001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.41	2.5	2.8	94	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 449695 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403023, 60227900008

METHOD BLANK: 1840314 Matrix: Water  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403023, 60227900008

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	
Sulfate	mg/L	<0.15	1.0	0.15	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	
Sulfate	mg/L	5	4.7	94	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840316 1840317

Parameter	Units	60227402015 Result	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	MSD Result						
Fluoride	mg/L	0.18J	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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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 449698	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60227900009	

METHOD BLANK: 1840351 Matrix: Water  
Associated Lab Samples: 60227900009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.027	0.20	0.027	10/08/16 16:57	

LABORATORY CONTROL SAMPLE: 1840352

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840353 1840354

Parameter	Units	60227900009		1840353		1840354		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	0.63	2.5	2.5	3.0	3.1	95	100	80-120	3	15

MATRIX SPIKE SAMPLE: 1840355

Parameter	Units	60227901011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	1.0	2.5	3.5	98	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 449710 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403023

METHOD BLANK: 1840645 Matrix: Water  
 Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403023

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		1840648		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result							
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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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch:	449712	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60227900009, 60227900010		

METHOD BLANK: 1840654 Matrix: Water  
Associated Lab Samples: 60227900009, 60227900010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	10/09/16 09:54	
Sulfate	mg/L	<0.15	1.0	0.15	10/09/16 09:54	

LABORATORY CONTROL SAMPLE: 1840655

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	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1840656 1840657

Parameter	Units	60227900009		1840657		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	25.5	10	10	34.6	34.7	92	92	80-120	0	15
Sulfate	mg/L	38.6	25	25	63.1	64.1	98	102	80-120	2	15

MATRIX SPIKE SAMPLE: 1840658

Parameter	Units	60227901011 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	39.4	25	65.7	105	80-120	
Sulfate	mg/L	386	250	647	105	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 453075	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60227900013	

METHOD BLANK: 1854685 Matrix: Water  
Associated Lab Samples: 60227900013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	11/02/16 21:15	
Fluoride	mg/L	<0.027	0.20	0.027	11/02/16 21:15	

LABORATORY CONTROL SAMPLE: 1854686

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	2.5	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1854687 1854688

Parameter	Units	60230483002		1854687		1854688		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	0.81	2.5	2.5	3.6	3.6	112	113	80-120	1	15

MATRIX SPIKE SAMPLE: 1854689

Parameter	Units	60230508001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	2.5	2.9	115	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 453197

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60227900013

METHOD BLANK: 1855165

Matrix: Water

Associated Lab Samples: 60227900013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.15	1.0	0.15	11/03/16 08:05	

LABORATORY CONTROL SAMPLE: 1855166

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.4	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1855167 1855168

Parameter	Units	60230483002		1855167		1855168		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
Sulfate	mg/L	157	100	100	259	260	103	103	80-120	0	15

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.126 ± 0.302 (0.583)</b> C:NA T:83%	pCi/L	10/05/16 22:58	13982-63-3	
Radium-228	EPA 904.0	<b>0.786 ± 0.586 (1.15)</b> C:67% T:71%	pCi/L	10/05/16 16:36	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-2D**      **Lab ID: 60227403019**      Collected: 09/14/16 15:50      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>0.154 ± 0.235 (0.378)</b> C:NA T:97%	pCi/L	10/05/16 23:21	13982-63-3	
Radium-228	EPA 904.0	<b>0.598 ± 0.469 (0.926)</b> C:70% T:81%	pCi/L	10/05/16 16:37	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-4D**      **Lab ID: 60227403021**      Collected: 09/14/16 14:33      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>0.124 ± 0.284 (0.457)</b> C:NA T:84%	pCi/L	10/05/16 23:58	13982-63-3	
Radium-228	EPA 904.0	<b>0.187 ± 0.435 (0.968)</b> C:71% T:78%	pCi/L	10/05/16 16:37	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0589 ± 0.306 (0.635)</b> C:NA T:92%	pCi/L	10/05/16 23:27	13982-63-3	
Radium-228	EPA 904.0	<b>0.714 ± 0.392 (0.700)</b> C:73% T:84%	pCi/L	10/05/16 20:45	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-DUP-1**      **Lab ID: 60227403023**      Collected: 09/14/16 08:00      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>0.0531 ± 0.242 (0.493)</b> <b>C:NA T:99%</b>	pCi/L	10/05/16 23:47	13982-63-3	
Radium-228	EPA 904.0	<b>0.305 ± 0.366 (0.751)</b> <b>C:68% T:83%</b>	pCi/L	10/05/16 21:00	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-3D**      **Lab ID: 60227403020**      Collected: 09/14/16 14:22      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>0.418 ± 0.391 (0.554)</b> <b>C:NA T:84%</b>	pCi/L	10/05/16 23:28	13982-63-3	
Radium-228	EPA 904.0	<b>1.88 ± 0.866 (1.44)</b> <b>C:67% T:79%</b>	pCi/L	10/05/16 16:37	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-FB-1**      **Lab ID: 60227900008**      Collected: 09/14/16 14:15      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>0.116 ± 0.280 (0.541)</b> <b>C:NA T:89%</b>	pCi/L	10/05/16 23:27	13982-63-3	
Radium-228	EPA 904.0	<b>-0.0122 ± 0.314 (0.700)</b> <b>C:70% T:88%</b>	pCi/L	10/05/16 21:01	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-5D**      **Lab ID: 60227900009**      Collected: 09/16/16 09:55      Received: 09/16/16 20:45      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>0.108 ± 0.246 (0.396)</b> <b>C:NA T:100%</b>	pCi/L	10/06/16 00:09	13982-63-3	
Radium-228	EPA 904.0	<b>0.574 ± 0.373 (0.694)</b> <b>C:73% T:83%</b>	pCi/L	10/05/16 21:01	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-6D**      **Lab ID: 60227900010**      Collected: 09/16/16 10:35      Received: 09/16/16 20:45      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>-0.176 ± 0.269 (0.706)</b> <b>C:NA T:92%</b>	pCi/L	10/05/16 12:52	13982-63-3	
Radium-228	EPA 904.0	<b>0.823 ± 0.345 (0.523)</b> <b>C:73% T:81%</b>	pCi/L	10/05/16 20:42	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

<b>Sample: S-UMW-5D MS</b>		<b>Lab ID: 60227900011</b>	Collected: 09/16/16 09:55	Received: 09/16/16 20:45	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>78.8%REC ± NA (NA)</b>	pCi/L	10/05/16 23:51	13982-63-3	
Radium-228	EPA 904.0	<b>94.4 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	10/05/16 20:46	15262-20-1	

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

**Sample: S-UMW-5D MSD**      **Lab ID: 60227900012**      Collected: 09/16/16 09:55      Received: 09/16/16 20:45      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>103.2%REC 26.83RPD ± NA (NA)</b>	pCi/L	10/05/16 23:52	13982-63-3	
Radium-228	EPA 904.0	<b>111 %REC 16.0 RPD +/- NA (NA) C:NA T:NA</b>	pCi/L	10/05/16 20:45	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 234076

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900011, 60227900012

METHOD BLANK: 1147973

Matrix: Water

Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900011, 60227900012

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 CTR-BOT

Pace Project No.: 60227900

QC Batch: 234072

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900011, 60227900012

METHOD BLANK: 1147966

Matrix: Water

Associated Lab Samples: 60227403018, 60227403019, 60227403020, 60227403021, 60227403022, 60227403023, 60227900008, 60227900009, 60227900011, 60227900012

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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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 234074

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60227900010

METHOD BLANK: 1147971

Matrix: Water

Associated Lab Samples: 60227900010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0610 ± 0.278 (0.449) C:NA T:94%	pCi/L	10/05/16 12:30	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

QC Batch: 234081

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60227900010

METHOD BLANK: 1147988

Matrix: Water

Associated Lab Samples: 60227900010

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.575 ± 0.292 (0.497) C:83% T:85%	pCi/L	10/05/16 20:41	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

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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 CTR-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227403018	S-UMW-1D	EPA 200.7	447059	EPA 200.7	447197
60227403019	S-UMW-2D	EPA 200.7	447059	EPA 200.7	447197
60227403020	S-UMW-3D	EPA 200.7	447059	EPA 200.7	447197
60227403021	S-UMW-4D	EPA 200.7	447059	EPA 200.7	447197
60227403022	S-BMW-1D	EPA 200.7	447059	EPA 200.7	447197
60227403023	S-UMW-DUP-1	EPA 200.7	447059	EPA 200.7	447197
60227900008	S-UMW-FB-1	EPA 200.7	447059	EPA 200.7	447197
60227900009	S-UMW-5D	EPA 200.7	447059	EPA 200.7	447197
60227900010	S-UMW-6D	EPA 200.7	447059	EPA 200.7	447197
60227403018	S-UMW-1D	EPA 200.8	447060	EPA 200.8	447199
60227403019	S-UMW-2D	EPA 200.8	447060	EPA 200.8	447199
60227403020	S-UMW-3D	EPA 200.8	447060	EPA 200.8	447199
60227403021	S-UMW-4D	EPA 200.8	447060	EPA 200.8	447199
60227403022	S-BMW-1D	EPA 200.8	447060	EPA 200.8	447199
60227403023	S-UMW-DUP-1	EPA 200.8	447060	EPA 200.8	447199
60227900008	S-UMW-FB-1	EPA 200.8	447060	EPA 200.8	447199
60227900009	S-UMW-5D	EPA 200.8	447060	EPA 200.8	447199
60227900010	S-UMW-6D	EPA 200.8	447060	EPA 200.8	447199
60227403018	S-UMW-1D	EPA 7470	447159	EPA 7470	447212
60227403019	S-UMW-2D	EPA 7470	447159	EPA 7470	447212
60227403020	S-UMW-3D	EPA 7470	447160	EPA 7470	447213
60227403021	S-UMW-4D	EPA 7470	447160	EPA 7470	447213
60227403022	S-BMW-1D	EPA 7470	447160	EPA 7470	447213
60227403023	S-UMW-DUP-1	EPA 7470	447160	EPA 7470	447213
60227900008	S-UMW-FB-1	EPA 7470	447160	EPA 7470	447213
60227900009	S-UMW-5D	EPA 7470	447160	EPA 7470	447213
60227900010	S-UMW-6D	EPA 7470	447160	EPA 7470	447213
60227403018	S-UMW-1D	EPA 903.1	234072		
60227403019	S-UMW-2D	EPA 903.1	234072		
60227403020	S-UMW-3D	EPA 903.1	234072		
60227403021	S-UMW-4D	EPA 903.1	234072		
60227403022	S-BMW-1D	EPA 903.1	234072		
60227403023	S-UMW-DUP-1	EPA 903.1	234072		
60227900008	S-UMW-FB-1	EPA 903.1	234072		
60227900009	S-UMW-5D	EPA 903.1	234072		
60227900010	S-UMW-6D	EPA 903.1	234074		
60227900011	S-UMW-5D MS	EPA 903.1	234072		
60227900012	S-UMW-5D MSD	EPA 903.1	234072		
60227403018	S-UMW-1D	EPA 904.0	234076		
60227403019	S-UMW-2D	EPA 904.0	234076		
60227403020	S-UMW-3D	EPA 904.0	234076		
60227403021	S-UMW-4D	EPA 904.0	234076		
60227403022	S-BMW-1D	EPA 904.0	234076		
60227403023	S-UMW-DUP-1	EPA 904.0	234076		
60227900008	S-UMW-FB-1	EPA 904.0	234076		

### REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,  
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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227900009	S-UMW-5D	EPA 904.0	234076		
60227900010	S-UMW-6D	EPA 904.0	234081		
60227900011	S-UMW-5D MS	EPA 904.0	234076		
60227900012	S-UMW-5D MSD	EPA 904.0	234076		
60227403018	S-UMW-1D	SM 2540C	447623		
60227403019	S-UMW-2D	SM 2540C	447478		
60227403020	S-UMW-3D	SM 2540C	447478		
60227403021	S-UMW-4D	SM 2540C	447478		
60227403022	S-BMW-1D	SM 2540C	447478		
60227403023	S-UMW-DUP-1	SM 2540C	447478		
60227900008	S-UMW-FB-1	SM 2540C	447478		
60227900009	S-UMW-5D	SM 2540C	447630		
60227900010	S-UMW-6D	SM 2540C	447630		
60227403018	S-UMW-1D	SM 4500-H+B	447880		
60227403019	S-UMW-2D	SM 4500-H+B	447611		
60227403020	S-UMW-3D	SM 4500-H+B	447611		
60227403021	S-UMW-4D	SM 4500-H+B	447611		
60227403022	S-BMW-1D	SM 4500-H+B	447611		
60227403023	S-UMW-DUP-1	SM 4500-H+B	447131		
60227900008	S-UMW-FB-1	SM 4500-H+B	447611		
60227900009	S-UMW-5D	SM 4500-H+B	447880		
60227900010	S-UMW-6D	SM 4500-H+B	447880		
60227403018	S-UMW-1D	EPA 300.0	449695		
60227403018	S-UMW-1D	EPA 300.0	449710		
60227403019	S-UMW-2D	EPA 300.0	449695		
60227403019	S-UMW-2D	EPA 300.0	449710		
60227403020	S-UMW-3D	EPA 300.0	449695		
60227403020	S-UMW-3D	EPA 300.0	449710		
60227403021	S-UMW-4D	EPA 300.0	449695		
60227403021	S-UMW-4D	EPA 300.0	449710		
60227403023	S-UMW-DUP-1	EPA 300.0	449695		
60227403023	S-UMW-DUP-1	EPA 300.0	449710		
60227900008	S-UMW-FB-1	EPA 300.0	449695		
60227900009	S-UMW-5D	EPA 300.0	449698		
60227900009	S-UMW-5D	EPA 300.0	449712		
60227900010	S-UMW-6D	EPA 300.0	449693		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60227900

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60227900010	S-UMW-6D	EPA 300.0	449712		
60227900013	S-BMW-1D	EPA 300.0	453075		
60227900013	S-BMW-1D	EPA 300.0	453197		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

60227403



60227403

COC # 3

Client Name: Egolder

Mudr (circled)

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 2.6, 13.0 Corr. Factor CF +1.1 CF -0.1 Corrected 3.9, 14.9

Date and initials of person examining contents: 1005 9/16/16

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>watx</u>	<input checked="" type="checkbox"/> Yes <input 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: <u>N/A</u>		
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: \_\_\_\_\_

Jami Chack

9/16/16

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 - Bottom Ash**  
 Project Number: **153-1406.0003A**

**Section C**  
Invoice Information:

Attention:  
 Company Name:  
 Address:  
 Pace Quote Reference:  
 Pace Project Manager: **Jamie Church**  
 Pace Profile #: **9285**

**REGULATORY AGENCY**

NPDES  
 GROUND WATER  
 RCRA  
 UST  
 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	Section D Required Client Information	COLLECTED		DATE TIME	DATE TIME	DATE TIME	DATE TIME	DATE TIME	DATE TIME	DATE TIME	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.																					
			MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)								COMPOSITE START	COMPOSITE END/GRAB	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test ↑			Metals*	Chloride/Fluoride/Sulfate	TDS	pH	Radium 226 & 228																
1	S-UMW-1D				9/15/14	1535																																		
2	S-UMW-2D				9/14/14	1550																																		
3	S-UMW-3D					1422																																		
4	S-UMW-4D					1432																																		
5	S-UMW-5D																																							
6	S-UMW-6D				9/14/14	1313																																		
7	S-BMW-1D																																							
8	S-BMW-2D				9/14/14	-																																		
9	S-UMW-DUP-1				9/14/14	1455																																		
10	S-UMW-FB-1																																							
11																																								
12																																								

65227433

Pace Project No./ Lab I.D.  
 1052N 1052N 2052N 611  
 615  
 820  
 22  
 1052N 1052N 2052N 612  
 1052N 1052N 2052N 612  
 1052N 1052N 2052N 612

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	Jeffrey Ingram (golder)	9/15/14	1700	Mark Haddock	9/15/14	1700
	Mark Haddock	9/15/14	1730	Jeffrey Ingram	9/15/14	1730
	Mark Haddock	9/15/14	1730	Jeffrey Ingram	9/15/14	1730

Temp In °C	Temp In °F	Received on	Cooler Sealed	Samples Intact
39	Y	Y	Y	Y
14.9	N	Y	Y	Y

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: **Jeffrey Ingram**  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YY): **09/15/14**

\*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#: 60227900



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 1.1 2.1 Corr. Factor: CF +1.1 CF -0.1 Corrected 19.2 4.0

Date and initials of person examining contents: JB 9/17

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>W/S</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: \_\_\_\_\_

\_\_\_\_\_ 9/19/16 \_\_\_\_\_

Project Manager Review: Jamie Church 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: **Golden 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 - Bottom Ash**  
 Project Number: **153-1406.0003A**

**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 #	Valid Matrix Codes MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	Preservatives	Requested Analysis Filtered (Y/N)								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.		
			COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	pH	Radium 226 & 228				
1	S-UMMW-1D	WT G																
2	S-UMMW-2D	WT G																
3	S-UMMW-3D	WT G																
4	S-UMMW-4D	WT G																
5	S-UMMW-5D	WT G	9/16/14	0155	12	H2SO4												70
6	S-UMMW-6D	WT G	10:25		4	HNO3												
7	S-BMW-1D	WT G																
8	S-BMW-2D	WT G																
9	S-UMMW-DUP-1	WT G																
10	S-UMMW-FB-1	WT G																
11																		
12																		

**ADDITIONAL COMMENTS:**  
 [Handwritten notes and signatures]

**RELINQUISHED BY / AFFILIATION:** [Signature]

**DATE:** 9/16/14 **TIME:** 1600

**ACCEPTED BY / AFFILIATION:** [Signature]

**DATE:** 9/16/14 **TIME:** 1620

**RELINQUISHED BY / AFFILIATION:** [Signature]

**DATE:** 9/16/14 **TIME:** 1700

**RECEIVED ON (Y/N)** **CUSTODY SEALED (Y/N)** **COOLER (Y/N)** **SAMPLES INTACT (Y/N)**

Temp in °C: 18.2  
9.0

**SAMPLER NAME AND SIGNATURE:** [Signature]

**PRINT Name of SAMPLER:** Jeff Ingram

**SIGNATURE of SAMPLER:** [Signature]

**DATE Signed (MM/DD/YYYY):** 09/16/14



Sample Condition Upon Receipt

WO#: 60227900



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:

M10/21/16

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"/> 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: \_\_\_\_\_

\_\_\_\_\_ Jamie Chack \_\_\_\_\_ 10/21/16 \_\_\_\_\_

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



December 23, 2016

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOT  
Pace Project No.: 60231802

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.

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-BOT

Pace Project No.: 60231802

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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-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60231802001	S-UMW-1D	Water	11/08/16 11:40	11/09/16 04:20
60231802002	S-UMW-2D	Water	11/07/16 15:03	11/09/16 04:20
60231802003	S-UMW-3D	Water	11/07/16 13:52	11/09/16 04:20
60231802004	S-UMW-4D	Water	11/07/16 11:05	11/09/16 04:20
60231802005	S-UMW-5D	Water	11/07/16 15:51	11/09/16 04:20
60231802006	S-UMW-6D	Water	11/08/16 09:25	11/09/16 04:20
60231802007	S-BMW-1D	Water	11/07/16 09:45	11/09/16 04:20
60231802008	S-UMW-DUP-1	Water	11/07/16 08:00	11/09/16 04:20
60231802009	S-UMW-FB-1	Water	11/08/16 15:00	11/09/16 04:20
60231802010	S-UMW-4D MS	Water	11/07/16 11:05	11/09/16 04:20
60231802011	S-UMW-4D MSD	Water	11/07/16 11:05	11/09/16 04:20
60232579001	S-BMW-3D	Water	11/17/16 13:53	11/18/16 03:35

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231802001	S-UMW-1D	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	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
60231802002	S-UMW-2D	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	JSS	1	PASI-K
60231802003	S-UMW-3D	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
60231802004	S-UMW-4D	SM 2540C	JSS	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
60231802005	S-UMW-5D	EPA 904.0	JLW	1	PASI-PA
		SM 2540C	JSS	1	PASI-K
		EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	ACM	1	PASI-PA
		EPA 7470	ZBM	1	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 200.7	NDJ	8	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231802006	S-UMW-6D	SM 2540C	JSS	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
60231802007	S-BMW-1D	SM 2540C	JSS	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
60231802008	S-UMW-DUP-1	SM 2540C	JSS	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
60231802009	S-UMW-FB-1	SM 2540C	JSS	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
60231802010	S-UMW-4D MS	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	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 CTR-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60231802011	S-UMW-4D MSD	EPA 903.1	ACM	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60232579001	S-BMW-3D	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		

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-1D**      **Lab ID: 60231802001**      Collected: 11/08/16 11:40      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>184</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:09	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:09	7440-41-7	
Boron	<b>454</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:09	7440-42-8	
Calcium	<b>110000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:09	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:09	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:09	7439-92-1	
Lithium	<b>15.5</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:09	7439-93-2	
Molybdenum	<b>27.9</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:09	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	11/09/16 17:00	11/22/16 13:19	7440-36-0	
Arsenic	<b>1.0</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:19	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:19	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:19	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:19	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:19	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	11/16/16 16:10	11/17/16 12:22	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>551</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>7.6</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>27.9</b>	mg/L	2.0	1.0	2		11/19/16 10:39	16887-00-6	
Fluoride	<b>0.25</b>	mg/L	0.20	0.027	1		11/18/16 17:51	16984-48-8	
Sulfate	<b>194</b>	mg/L	20.0	3.1	20		11/19/16 10:54	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-2D**      **Lab ID: 6023180202**      Collected: 11/07/16 15:03      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>85.8</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:11	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:11	7440-41-7	
Boron	<b>10600</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:11	7440-42-8	
Calcium	<b>177000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:11	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:11	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:11	7439-92-1	
Lithium	<b>31.1</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:11	7439-93-2	
Molybdenum	<b>989</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:11	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	11/09/16 17:00	11/22/16 13:23	7440-36-0	
Arsenic	<b>1.5</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:23	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:23	7440-43-9	
Chromium	<b>0.55J</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:23	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:23	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:23	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	11/16/16 16:10	11/17/16 12:25	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>823</b>	mg/L	5.0	5.0	1		11/10/16 11:21		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.0</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>19.8</b>	mg/L	1.0	0.50	1		11/18/16 18:05	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.027	1		11/18/16 18:05	16984-48-8	
Sulfate	<b>444</b>	mg/L	50.0	7.7	50		11/19/16 11:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-3D**      **Lab ID: 60231802003**      Collected: 11/07/16 13:52      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>70.9</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:13	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:13	7440-41-7	
Boron	<b>26400</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:13	7440-42-8	
Calcium	<b>230000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:13	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:13	7440-48-4	
Lead	<b>3.5J</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:13	7439-92-1	
Lithium	<b>16.2</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:13	7439-93-2	
Molybdenum	<b>4230</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:13	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	11/09/16 17:00	11/22/16 13:28	7440-36-0	
Arsenic	<b>0.41J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:28	7440-38-2	
Cadmium	<b>0.12J</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:28	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:28	7440-47-3	
Selenium	<b>0.27J</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:28	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:28	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	11/16/16 16:10	11/17/16 12:27	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1120</b>	mg/L	5.0	5.0	1		11/10/16 11:22		
<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		11/12/16 11:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>21.0</b>	mg/L	2.0	1.0	2		11/19/16 11:25	16887-00-6	
Fluoride	<b>0.95</b>	mg/L	0.20	0.027	1		11/18/16 18:19	16984-48-8	
Sulfate	<b>810</b>	mg/L	50.0	7.7	50		11/19/16 11:41	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-4D**      **Lab ID: 60231802004**      Collected: 11/07/16 11:05      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>72.0</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:16	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:16	7440-41-7	
Boron	<b>24600</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:16	7440-42-8	M1
Calcium	<b>186000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:16	7440-70-2	M1
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:16	7440-48-4	
Lead	<b>5.6</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:16	7439-92-1	
Lithium	<b>41.3</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:16	7439-93-2	
Molybdenum	<b>7190</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:16	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	11/09/16 17:00	11/22/16 13:32	7440-36-0	
Arsenic	<b>0.18J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:32	7440-38-2	
Cadmium	<b>0.13J</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:32	7440-43-9	
Chromium	<b>0.34J</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:32	7440-47-3	
Selenium	<b>0.22J</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:32	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:32	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	11/16/16 16:10	11/17/16 12:29	7439-97-6	M1
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1020</b>	mg/L	5.0	5.0	1		11/10/16 11:22		
<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		11/12/16 12:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.1</b>	mg/L	2.0	1.0	2		11/19/16 12:27	16887-00-6	
Fluoride	<b>0.78</b>	mg/L	0.20	0.027	1		11/18/16 18:33	16984-48-8	
Sulfate	<b>600</b>	mg/L	50.0	7.7	50		11/19/16 13:13	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-5D**      **Lab ID: 60231802005**      Collected: 11/07/16 15:51      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>296</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:22	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:22	7440-41-7	
Boron	<b>12400</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:22	7440-42-8	
Calcium	<b>94000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:22	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:22	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:22	7439-92-1	
Lithium	<b>32.5</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:22	7439-93-2	
Molybdenum	<b>253</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:22	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	11/09/16 17:00	11/22/16 13:45	7440-36-0	
Arsenic	<b>0.62J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:45	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:45	7440-43-9	
Chromium	<b>0.44J</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:45	7440-47-3	
Selenium	<b>0.29J</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:45	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:45	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	11/16/16 16:10	11/17/16 12:40	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		11/10/16 11:23		
<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		11/12/16 11:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.1</b>	mg/L	2.0	1.0	2		11/19/16 13:59	16887-00-6	
Fluoride	<b>0.70</b>	mg/L	0.20	0.027	1		11/18/16 19:15	16984-48-8	
Sulfate	<b>48.7</b>	mg/L	5.0	0.77	5		11/19/16 14:15	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-6D**      **Lab ID: 60231802006**      Collected: 11/08/16 09:25      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>116</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:35	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:35	7440-41-7	
Boron	<b>902</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:35	7440-42-8	
Calcium	<b>77600</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:35	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:35	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:35	7439-92-1	
Lithium	<b>13.6</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:35	7439-93-2	
Molybdenum	<b>114</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:35	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	11/09/16 17:00	11/22/16 13:50	7440-36-0	
Arsenic	<b>0.38J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 13:50	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 13:50	7440-43-9	
Chromium	<b>0.37J</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 13:50	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 13:50	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 13:50	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	11/16/16 16:10	11/17/16 12:43	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>352</b>	mg/L	5.0	5.0	1		11/10/16 11:26		
<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		11/12/16 12:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.9</b>	mg/L	2.0	1.0	2		11/19/16 14:30	16887-00-6	
Fluoride	<b>0.40</b>	mg/L	0.20	0.027	1		11/18/16 19:28	16984-48-8	
Sulfate	<b>79.2</b>	mg/L	5.0	0.77	5		11/19/16 14:45	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-BMW-1D**      **Lab ID: 60231802007**      Collected: 11/07/16 09:45      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>308</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:38	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:38	7440-41-7	
Boron	<b>174</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:38	7440-42-8	
Calcium	<b>129000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:38	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:38	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:38	7439-92-1	
Lithium	<b>14.8</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:38	7439-93-2	
Molybdenum	<b>1.2J</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:38	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.058</b>	ug/L	1.0	0.058	1	11/09/16 17:00	11/22/16 14:07	7440-36-0	
Arsenic	<b>0.15J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 14:07	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 14:07	7440-43-9	
Chromium	<b>0.35J</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 14:07	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 14:07	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 14:07	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	11/16/16 16:10	11/17/16 12:45	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>469</b>	mg/L	5.0	5.0	1		11/10/16 11:24		
<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		11/12/16 11:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.6</b>	mg/L	1.0	0.50	1		11/18/16 20:10	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.027	1		11/18/16 20:10	16984-48-8	
Sulfate	<b>37.7</b>	mg/L	5.0	0.77	5		11/19/16 15:32	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-DUP-1**      **Lab ID: 6023180208**      Collected: 11/07/16 08:00      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>73.3</b>	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:40	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:40	7440-41-7	
Boron	<b>26700</b>	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:40	7440-42-8	
Calcium	<b>240000</b>	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:40	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:40	7440-48-4	
Lead	<b>3.2J</b>	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:40	7439-92-1	
Lithium	<b>20.3</b>	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:40	7439-93-2	
Molybdenum	<b>4340</b>	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:40	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	11/09/16 17:00	11/22/16 14:12	7440-36-0	
Arsenic	<b>0.44J</b>	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 14:12	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 14:12	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 14:12	7440-47-3	
Selenium	<b>0.23J</b>	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 14:12	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 14:12	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	11/16/16 16:10	11/17/16 12:47	7439-97-6	
<b>2540C Total Dissolved Solids</b>									
Analytical Method: SM 2540C									
Total Dissolved Solids	<b>1170</b>	mg/L	5.0	5.0	1		11/10/16 11:24		
<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		11/12/16 11:00		H6
<b>300.0 IC Anions 28 Days</b>									
Analytical Method: EPA 300.0									
Chloride	<b>21.2</b>	mg/L	2.0	1.0	2		11/19/16 15:47	16887-00-6	
Fluoride	<b>0.83</b>	mg/L	0.20	0.027	1		11/18/16 20:24	16984-48-8	
Sulfate	<b>774</b>	mg/L	50.0	7.7	50		11/19/16 16:03	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-FB-1**      **Lab ID: 6023180209**      Collected: 11/08/16 15:00      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	<0.58	ug/L	5.0	0.58	1	11/09/16 17:00	11/11/16 13:42	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	11/09/16 17:00	11/11/16 13:42	7440-41-7	
Boron	70.0J	ug/L	100	50.0	1	11/09/16 17:00	11/11/16 13:42	7440-42-8	
Calcium	89.4J	ug/L	100	8.1	1	11/09/16 17:00	11/11/16 13:42	7440-70-2	B
Cobalt	<0.72	ug/L	5.0	0.72	1	11/09/16 17:00	11/11/16 13:42	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	11/09/16 17:00	11/11/16 13:42	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	11/09/16 17:00	11/11/16 13:42	7439-93-2	
Molybdenum	4.5J	ug/L	20.0	0.52	1	11/09/16 17:00	11/11/16 13:42	7439-98-7	B
<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	11/09/16 17:00	11/22/16 14:03	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	11/09/16 17:00	11/22/16 14:03	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	11/09/16 17:00	11/22/16 14:03	7440-43-9	
Chromium	<0.34	ug/L	1.0	0.34	1	11/09/16 17:00	11/22/16 14:03	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	11/09/16 17:00	11/22/16 14:03	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	11/09/16 17:00	11/22/16 14:03	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	11/16/16 16:10	11/17/16 12:49	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		11/10/16 11:26		
<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		11/14/16 06:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		11/18/16 20:38	16887-00-6	
Fluoride	<0.027	mg/L	0.20	0.027	1		11/18/16 20:38	16984-48-8	
Sulfate	<0.15	mg/L	1.0	0.15	1		11/18/16 20:38	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-BMW-3D**      **Lab ID: 60232579001**      Collected: 11/17/16 13:53      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>612</b>	ug/L	5.0	0.58	1	11/18/16 16:30	11/23/16 14:37	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	11/18/16 16:30	11/23/16 14:37	7440-41-7	
Boron	<b>50.7J</b>	ug/L	100	50.0	1	11/18/16 16:30	11/23/16 14:37	7440-42-8	
Calcium	<b>104000</b>	ug/L	100	8.1	1	11/18/16 16:30	11/23/16 14:37	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	11/18/16 16:30	11/23/16 14:37	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	11/18/16 16:30	11/23/16 14:37	7439-92-1	
Lithium	<b>14.2</b>	ug/L	10.0	4.9	1	11/18/16 16:30	11/23/16 14:37	7439-93-2	
Molybdenum	<b>1.8J</b>	ug/L	20.0	0.52	1	11/18/16 16:30	11/23/16 14:37	7439-98-7	B
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.27J</b>	ug/L	1.0	0.058	1	11/18/16 16:30	11/30/16 16:23	7440-36-0	B
Arsenic	<b>0.24J</b>	ug/L	1.0	0.10	1	11/18/16 16:30	12/01/16 18:13	7440-38-2	
Cadmium	<b>0.046J</b>	ug/L	0.50	0.029	1	11/18/16 16:30	11/30/16 16:23	7440-43-9	B
Chromium	<b>0.46J</b>	ug/L	1.0	0.34	1	11/18/16 16:30	11/30/16 16:23	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	11/18/16 16:30	11/30/16 16:23	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	11/18/16 16:30	11/30/16 16:23	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470      Preparation Method: EPA 7470							
Mercury	<b>0.046J</b>	ug/L	0.20	0.039	1	11/28/16 16:30	11/29/16 11:50	7439-97-6	B
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>429</b>	mg/L	5.0	5.0	1		11/23/16 15:28		
<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>8.5</b>	mg/L	1.0	0.50	1		12/09/16 09:52	16887-00-6	M1
Fluoride	<b>0.28</b>	mg/L	0.20	0.027	1		12/09/16 09:52	16984-48-8	M1
Sulfate	<b>26.9</b>	mg/L	2.0	0.31	2		12/12/16 00:22	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 455125

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

METHOD BLANK: 1863621

Matrix: Water

Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.039	0.20	0.039	11/17/16 12:14	

LABORATORY CONTROL SAMPLE: 1863622

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.6	113	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1863623 1863624

Parameter	Units	60231802004 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	3.6	3.5	72	71	75-125	2	20	M1

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 456625 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60232579001

METHOD BLANK: 1869658 Matrix: Water  
 Associated Lab Samples: 60232579001

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		1869660		1869661		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % 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 CTR-BOT

Pace Project No.: 60231802

QC Batch:	454175	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009		

METHOD BLANK:	1859682	Matrix:	Water
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009		

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	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60231802004 Result	Spike Conc.	Spike Conc.	MS Result						
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 CTR-BOT

Pace Project No.: 60231802

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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 455694 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60232579001

METHOD BLANK: 1865875 Matrix: Water  
 Associated Lab Samples: 60232579001

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		1865877		1865878		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % 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 CTR-BOT

Pace Project No.: 60231802

MATRIX SPIKE SAMPLE: 1865879		60232589006	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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 CTR-BOT

Pace Project No.: 60231802

QC Batch:	454179	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009		

METHOD BLANK:	1859707	Matrix:	Water
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009		

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	<0.058	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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.35J	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	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameter	Units	60231804001		1859711		1859712		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result							
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			
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 CTR-BOT  
Pace Project No.: 60231802

QC Batch: 455691 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60232579001

METHOD BLANK: 1865866 Matrix: Water  
Associated Lab Samples: 60232579001

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		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	0.18J	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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 454266

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

METHOD BLANK: 1860122

Matrix: Water

Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 456308

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60232579001

METHOD BLANK: 1868508

Matrix: Water

Associated Lab Samples: 60232579001

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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 454661 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60231802008

SAMPLE DUPLICATE: 1862077

Parameter	Units	60231506002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	7.0	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 454662 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60231802002, 60231802003, 60231802005, 60231802007

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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 454663 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60231802004, 60231802006

SAMPLE DUPLICATE: 1862080

Parameter	Units	60231802004 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-BOT

Pace Project No.: 60231802

QC Batch: 454699 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60231802001, 60231802009

SAMPLE DUPLICATE: 1862311

Parameter	Units	60231804001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.3	7.3	0	5	H6

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 457036 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60232579001

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 CTR-BOT  
Pace Project No.: 60231802

QC Batch: 455675 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

METHOD BLANK: 1865810 Matrix: Water  
Associated Lab Samples: 60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009

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	
Sulfate	mg/L	<0.15	1.0	0.15	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	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1865812 1865813

Parameter	Units	60231802004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.78	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 CTR-BOT

Pace Project No.: 60231802

QC Batch:	455761	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008		

METHOD BLANK:	1866337	Matrix:	Water
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	11/19/16 08:46	
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
Chloride	mg/L	5	4.8	96	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1866339												1866340	
Parameter	Units	60231802004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
Chloride	mg/L	24.1	10	10	35.9	36.0	118	119	80-120	0	15		
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				
Chloride	mg/L		24.9	10	37.1	122	80-120 M1				
Sulfate	mg/L		115	50	167	103	80-120				

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 458214

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60232579001

METHOD BLANK: 1875991

Matrix: Water

Associated Lab Samples: 60232579001

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		1875994		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	8.5	5	5	14.6	14.6	122	121	80-120	0	15 M1
Fluoride	mg/L	0.28	2.5	2.5	3.3	3.3	122	122	80-120	1	15 M1

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 458452

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60232579001

METHOD BLANK: 1876996

Matrix: Water

Associated Lab Samples: 60232579001

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 CTR-BOT

Pace Project No.: 60231802

Sample: S-UMW-1D		Lab ID: 60231802001	Collected: 11/08/16 11:40	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>0.181 ± 0.276 (0.444)</b>		pCi/L	12/06/16 19:15	13982-63-3	
		<b>C:NA T:102%</b>					
Radium-228	EPA 904.0	<b>0.747 ± 0.375 (0.642)</b>		pCi/L	12/07/16 11:18	15262-20-1	
		<b>C:79% T:82%</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>-0.074 ± 0.437 (0.975)</b> <b>C:NA T:87%</b>	pCi/L	12/06/16 19:15	13982-63-3	
Radium-228	EPA 904.0	<b>0.477 ± 0.305 (0.562)</b> <b>C:80% T:83%</b>	pCi/L	12/07/16 11:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.284 (0.578)</b> C:NA T:94%	pCi/L	12/06/16 19:15	13982-63-3	
Radium-228	EPA 904.0	<b>0.567 ± 0.335 (0.595)</b> C:79% T:81%	pCi/L	12/07/16 11:58	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Sample: S-UMW-4D		Lab ID: 60231802004	Collected: 11/07/16 11:05	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>0.0677 ± 0.309 (0.629)</b>		pCi/L	12/06/16 19:15	13982-63-3	
		<b>C:NA T:87%</b>					
Radium-228	EPA 904.0	<b>0.615 ± 0.328 (0.568)</b>		pCi/L	12/07/16 11:18	15262-20-1	
		<b>C:81% T:85%</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.380 (0.804)</b> <b>C:NA T:94%</b>	pCi/L	12/06/16 19:15	13982-63-3	
Radium-228	EPA 904.0	<b>0.902 ± 0.409 (0.671)</b> <b>C:78% T:88%</b>	pCi/L	12/07/16 11:58	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.595 ± 0.410 (0.438)</b> <b>C:NA T:94%</b>	pCi/L	12/06/16 19:15	13982-63-3	
Radium-228	EPA 904.0	<b>0.0748 ± 0.314 (0.714)</b> <b>C:79% T:77%</b>	pCi/L	12/07/16 11:18	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-BMW-1D**      **Lab ID: 60231802007**      Collected: 11/07/16 09:45      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>0.659 ± 0.490 (0.645)</b> C:NA T:95%	pCi/L	12/06/16 19:44	13982-63-3	
Radium-228	EPA 904.0	<b>0.863 ± 0.358 (0.530)</b> C:85% T:84%	pCi/L	12/07/16 11:57	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Sample: S-UMW-DUP-1		Lab ID: 60231802008	Collected: 11/07/16 08:00	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>0.283 ± 0.341 (0.520)</b>		pCi/L	12/06/16 19:45	13982-63-3	
		<b>C:NA T:83%</b>					
Radium-228	EPA 904.0	<b>0.448 ± 0.309 (0.585)</b>		pCi/L	12/07/16 11:18	15262-20-1	
		<b>C:81% T:84%</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

**Sample: S-UMW-FB-1**      **Lab ID: 60231802009**      Collected: 11/08/16 15:00      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>0.000 ± 0.276 (0.620)</b> C:NA T:95%	pCi/L	12/06/16 19:44	13982-63-3	
Radium-228	EPA 904.0	<b>0.447 ± 0.354 (0.697)</b> C:86% T:75%	pCi/L	12/07/16 11:57	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Sample: S-UMW-4D MS		Lab ID: 60231802010	Collected: 11/07/16 11:05	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>94.0 %REC ± NA (NA)</b>		pCi/L	12/06/16 19:44	13982-63-3	
Radium-228	EPA 904.0	<b>136.05 %REC ± NA (NA)</b>		pCi/L	12/07/16 11:19	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>89.4 %REC 4.92 RPD ± NA (NA)</b> C:NA T:NA	pCi/L	12/06/16 19:45	13982-63-3	
Radium-228	EPA 904.0	<b>108.29 %REC 22.73 RPD ± NA (NA)</b> C:NA T:NA	pCi/L	12/07/16 11:19	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.340 ± 0.517 (0.890)</b> C:NA T:92%	pCi/L	12/19/16 12:50	13982-63-3	
Radium-228	EPA 904.0	<b>0.992 ± 0.415 (0.648)</b> C:77% T:85%	pCi/L	12/20/16 15:33	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

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QC Batch:	241596	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009, 60231802010, 60231802011		

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METHOD BLANK:	1187622	Matrix:	Water
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009, 60231802010, 60231802011		

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Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0612 ± 0.317 (0.659) C:NA T:97%	pCi/L	12/06/16 12:19	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

QC Batch: 242561

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60232579001

METHOD BLANK: 1192292

Matrix: Water

Associated Lab Samples: 60232579001

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	

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 CTR-BOT

Pace Project No.: 60231802

QC Batch: 242562

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60232579001

METHOD BLANK: 1192293

Matrix: Water

Associated Lab Samples: 60232579001

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 CTR-BOT

Pace Project No.: 60231802

---

QC Batch:	241603	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009, 60231802010, 60231802011		

---

METHOD BLANK:	1187635	Matrix:	Water
Associated Lab Samples:	60231802001, 60231802002, 60231802003, 60231802004, 60231802005, 60231802006, 60231802007, 60231802008, 60231802009, 60231802010, 60231802011		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.948 ± 0.429 (0.689) C:74% T:80%	pCi/L	12/07/16 11:57	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

---

### 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.

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-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231802001	S-UMW-1D	EPA 200.7	454175	EPA 200.7	454324
60231802002	S-UMW-2D	EPA 200.7	454175	EPA 200.7	454324
60231802003	S-UMW-3D	EPA 200.7	454175	EPA 200.7	454324
60231802004	S-UMW-4D	EPA 200.7	454175	EPA 200.7	454324
60231802005	S-UMW-5D	EPA 200.7	454175	EPA 200.7	454324
60231802006	S-UMW-6D	EPA 200.7	454175	EPA 200.7	454324
60231802007	S-BMW-1D	EPA 200.7	454175	EPA 200.7	454324
60231802008	S-UMW-DUP-1	EPA 200.7	454175	EPA 200.7	454324
60231802009	S-UMW-FB-1	EPA 200.7	454175	EPA 200.7	454324
60232579001	S-BMW-3D	EPA 200.7	455694	EPA 200.7	455911
60231802001	S-UMW-1D	EPA 200.8	454179	EPA 200.8	454325
60231802002	S-UMW-2D	EPA 200.8	454179	EPA 200.8	454325
60231802003	S-UMW-3D	EPA 200.8	454179	EPA 200.8	454325
60231802004	S-UMW-4D	EPA 200.8	454179	EPA 200.8	454325
60231802005	S-UMW-5D	EPA 200.8	454179	EPA 200.8	454325
60231802006	S-UMW-6D	EPA 200.8	454179	EPA 200.8	454325
60231802007	S-BMW-1D	EPA 200.8	454179	EPA 200.8	454325
60231802008	S-UMW-DUP-1	EPA 200.8	454179	EPA 200.8	454325
60231802009	S-UMW-FB-1	EPA 200.8	454179	EPA 200.8	454325
60232579001	S-BMW-3D	EPA 200.8	455691	EPA 200.8	455912
60231802001	S-UMW-1D	EPA 7470	455125	EPA 7470	455349
60231802002	S-UMW-2D	EPA 7470	455125	EPA 7470	455349
60231802003	S-UMW-3D	EPA 7470	455125	EPA 7470	455349
60231802004	S-UMW-4D	EPA 7470	455125	EPA 7470	455349
60231802005	S-UMW-5D	EPA 7470	455125	EPA 7470	455349
60231802006	S-UMW-6D	EPA 7470	455125	EPA 7470	455349
60231802007	S-BMW-1D	EPA 7470	455125	EPA 7470	455349
60231802008	S-UMW-DUP-1	EPA 7470	455125	EPA 7470	455349
60231802009	S-UMW-FB-1	EPA 7470	455125	EPA 7470	455349
60232579001	S-BMW-3D	EPA 7470	456625	EPA 7470	456654
60231802001	S-UMW-1D	EPA 903.1	241596		
60231802002	S-UMW-2D	EPA 903.1	241596		
60231802003	S-UMW-3D	EPA 903.1	241596		
60231802004	S-UMW-4D	EPA 903.1	241596		
60231802005	S-UMW-5D	EPA 903.1	241596		
60231802006	S-UMW-6D	EPA 903.1	241596		
60231802007	S-BMW-1D	EPA 903.1	241596		
60231802008	S-UMW-DUP-1	EPA 903.1	241596		
60231802009	S-UMW-FB-1	EPA 903.1	241596		
60231802010	S-UMW-4D MS	EPA 903.1	241596		
60231802011	S-UMW-4D MSD	EPA 903.1	241596		
60232579001	S-BMW-3D	EPA 903.1	242561		
60231802001	S-UMW-1D	EPA 904.0	241603		
60231802002	S-UMW-2D	EPA 904.0	241603		
60231802003	S-UMW-3D	EPA 904.0	241603		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231802004	S-UMW-4D	EPA 904.0	241603		
60231802005	S-UMW-5D	EPA 904.0	241603		
60231802006	S-UMW-6D	EPA 904.0	241603		
60231802007	S-BMW-1D	EPA 904.0	241603		
60231802008	S-UMW-DUP-1	EPA 904.0	241603		
60231802009	S-UMW-FB-1	EPA 904.0	241603		
60231802010	S-UMW-4D MS	EPA 904.0	241603		
60231802011	S-UMW-4D MSD	EPA 904.0	241603		
60232579001	S-BMW-3D	EPA 904.0	242562		
60231802001	S-UMW-1D	SM 2540C	454266		
60231802002	S-UMW-2D	SM 2540C	454266		
60231802003	S-UMW-3D	SM 2540C	454266		
60231802004	S-UMW-4D	SM 2540C	454266		
60231802005	S-UMW-5D	SM 2540C	454266		
60231802006	S-UMW-6D	SM 2540C	454266		
60231802007	S-BMW-1D	SM 2540C	454266		
60231802008	S-UMW-DUP-1	SM 2540C	454266		
60231802009	S-UMW-FB-1	SM 2540C	454266		
60232579001	S-BMW-3D	SM 2540C	456308		
60231802001	S-UMW-1D	SM 4500-H+B	454699		
60231802002	S-UMW-2D	SM 4500-H+B	454662		
60231802003	S-UMW-3D	SM 4500-H+B	454662		
60231802004	S-UMW-4D	SM 4500-H+B	454663		
60231802005	S-UMW-5D	SM 4500-H+B	454662		
60231802006	S-UMW-6D	SM 4500-H+B	454663		
60231802007	S-BMW-1D	SM 4500-H+B	454662		
60231802008	S-UMW-DUP-1	SM 4500-H+B	454661		
60231802009	S-UMW-FB-1	SM 4500-H+B	454699		
60232579001	S-BMW-3D	SM 4500-H+B	457036		
60231802001	S-UMW-1D	EPA 300.0	455675		
60231802001	S-UMW-1D	EPA 300.0	455761		
60231802002	S-UMW-2D	EPA 300.0	455675		
60231802002	S-UMW-2D	EPA 300.0	455761		
60231802003	S-UMW-3D	EPA 300.0	455675		
60231802003	S-UMW-3D	EPA 300.0	455761		
60231802004	S-UMW-4D	EPA 300.0	455675		
60231802004	S-UMW-4D	EPA 300.0	455761		
60231802005	S-UMW-5D	EPA 300.0	455675		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOT

Pace Project No.: 60231802

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60231802005	S-UMW-5D	EPA 300.0	455761		
60231802006	S-UMW-6D	EPA 300.0	455675		
60231802006	S-UMW-6D	EPA 300.0	455761		
60231802007	S-BMW-1D	EPA 300.0	455675		
60231802007	S-BMW-1D	EPA 300.0	455761		
60231802008	S-UMW-DUP-1	EPA 300.0	455675		
60231802008	S-UMW-DUP-1	EPA 300.0	455761		
60231802009	S-UMW-FB-1	EPA 300.0	455675		
60232579001	S-BMW-3D	EPA 300.0	458214		
60232579001	S-BMW-3D	EPA 300.0	458452		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60231802  
60231802

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 1.4/13.9 Corr. Factor CF +0.7 / CF -0.5 Corrected 2.1/14.6/13.3

Date and initials of person examining contents:

Temperature should be above freezing to 6°C 12.6

pm 11/9/16

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 Chok \_\_\_\_\_ Date: 11/9/16

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





Sample Condition Upon Receipt

WO#: 60232579
Barcode
60232579

Client Name: Golder

JLC

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: 11/18/16

Table with 2 columns: Question/Requirement and Yes/No/N/A checkboxes. Rows include Chain of Custody, Short Hold Time, Rush Turn Around Time, Sufficient volume, Correct containers used, Pace containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match COC, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, Lead acetate strip, Potassium iodide test strip, Trip Blank present, Headspace in VOA vials, Samples from USDA Regulated Area, Additional labels attached.

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: 11/18/16

# 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](mailto: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 - Bottom Ash  
 Project Number: 153-1406.0003A

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

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

ITEM #	Valid Matrix Codes MATRIX DRINKING WATER WASTE WATER PRODUCT SOLID OIL	MATRIX CODE (see valid codes to left)	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	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> S <sub>2</sub> O <sub>3</sub> Methanol Other	Requested Analysis Filtered (Y/N)	Temp in °C	Received on	Custody Sealed	Cooler (Y/N)	Samples Intact (Y/N)					
			COMPOSITE START	COMPOSITE END/GRAB											DATE	TIME	DATE	TIME	
1	<del>S-UWW-1D</del>	WT G																	
2	<del>S-UWW-2D</del>	WT G																	
3	<del>S-UWW-3B</del>	WT G																	
4	<del>S-UWW-4D</del>	WT G																	
5	<del>S-UWW-5D</del>	WT G																	
6	<del>S-UWW-5D</del>	WT G																	
7	<del>S-UWW-4D</del>	WT G																	
8	<del>S-UWW-2D</del>	WT G																	
9	<del>S-UWW-DUP-1</del>	WT G																	
10	<del>S-UWW-FB-1</del>	WT G																	
11	S-UWW-3D	WT G	09/17/16	1353	WT G	11/17/16	1353	4	3	18/16	18/16	1500	0335	2-2	Y	Y	Y	Y	
12																			

**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**  
 DATE: 11/17/16 TIME: 1500  
 SIGNATURE: [Signature]

**ACCEPTED BY / AFFILIATION**  
 DATE: 11/18/16 TIME: 0335  
 SIGNATURE: [Signature]

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: John Loretz  
 SIGNATURE of SAMPLER: [Signature]  
 DATE Signed (MM/DD/YYYY): 11/17/16

\*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.



January 12, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTTOM  
Pace Project No.: 60233958

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-BOTTOM

Pace Project No.: 60233958

---

### 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-BOTTOM

Pace Project No.: 60233958

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60233958001	S-BMW-3D	Water	12/08/16 11:15	12/09/16 04:40

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60233958001	S-BMW-3D	EPA 200.7	TDS	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	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

**Sample: S-BMW-3D**      **Lab ID: 60233958001**      Collected: 12/08/16 11:15      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>667</b>	ug/L	5.0	0.58	1	12/13/16 15:05	12/15/16 14:49	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	12/13/16 15:05	12/15/16 14:49	7440-41-7	
Boron	<b>53.1J</b>	ug/L	100	50.0	1	12/13/16 15:05	12/15/16 14:49	7440-42-8	
Calcium	<b>103000</b>	ug/L	100	8.1	1	12/13/16 15:05	12/15/16 14:49	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	12/13/16 15:05	12/15/16 14:49	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	12/13/16 15:05	12/15/16 14:49	7439-92-1	
Lithium	<b>20.6</b>	ug/L	10.0	4.9	1	12/13/16 15:05	12/15/16 14:49	7439-93-2	
Molybdenum	<b>1.8J</b>	ug/L	20.0	0.52	1	12/13/16 15:05	12/15/16 14:49	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	0.058	1	12/13/16 10:50	12/14/16 12:29	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	12/13/16 10:50	12/14/16 12:29	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	12/13/16 10:50	12/14/16 12:29	7440-43-9	
Chromium	<b>0.99J</b>	ug/L	1.0	0.34	1	12/13/16 10:50	12/14/16 12:29	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	12/13/16 10:50	12/14/16 12:29	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	12/13/16 10:50	12/14/16 12:29	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 10:24	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>425</b>	mg/L	5.0	5.0	1		12/13/16 16:45		
<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		12/19/16 08:40		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>10.8</b>	mg/L	1.0	0.50	1		12/22/16 00:18	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		12/22/16 00:18	16984-48-8	
Sulfate	<b>36.8</b>	mg/L	2.0	0.31	2		12/22/16 10:52	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

QC Batch: 458785

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60233958001

METHOD BLANK: 1878151

Matrix: Water

Associated Lab Samples: 60233958001

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		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
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-BOTTOM

Pace Project No.: 60233958

QC Batch: 458773 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60233958001

METHOD BLANK: 1878108 Matrix: Water  
Associated Lab Samples: 60233958001

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-BOTTOM

Pace Project No.: 60233958

MATRIX SPIKE SAMPLE: 1878112		60233958001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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-BOTTOM

Pace Project No.: 60233958

QC Batch: 458723	Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8	Analysis Description: 200.8 MET
Associated Lab Samples: 60233958001	

METHOD BLANK: 1877907 Matrix: Water  
Associated Lab Samples: 60233958001

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.	MSD Spike Conc.	MS 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-BOTTOM

Pace Project No.: 60233958

QC Batch: 458809

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60233958001

METHOD BLANK: 1878246

Matrix: Water

Associated Lab Samples: 60233958001

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-BOTTOM

Pace Project No.: 60233958

QC Batch: 459374 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60233958001

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-BOTTOM

Pace Project No.: 60233958

QC Batch: 459810 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60233958001

METHOD BLANK: 1882488 Matrix: Water

Associated Lab Samples: 60233958001

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-BOTTOM

Pace Project No.: 60233958

QC Batch: 459964	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60233958001	

METHOD BLANK: 1883030 Matrix: Water  
Associated Lab Samples: 60233958001

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				
Sulfate	mg/L	36.8	10	10	47.3	47.3	105	105	80-120	0	15

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-BMW-3D</b> <b>Lab ID: 60233958001</b> Collected: 12/08/16 11:15      Received: 12/09/16 04:40      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>0.342 ± 0.383 (0.556)</b> C:NA T:91%	pCi/L	01/09/17 16:18	13982-63-3	
Radium-228	EPA 904.0	<b>0.761 ± 0.428 (0.776)</b> C:71% T:81%	pCi/L	01/11/17 15:06	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

QC Batch: 245293

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60233958001

METHOD BLANK: 1207282

Matrix: Water

Associated Lab Samples: 60233958001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0746 ± 0.323 (0.732) C:72% T:93%	pCi/L	01/10/17 12:04	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

QC Batch: 245233

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60233958001

METHOD BLANK: 1207115

Matrix: Water

Associated Lab Samples: 60233958001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.186 ± 0.318 (0.517) C:NA T:91%	pCi/L	01/09/17 15:16	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

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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.

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTTOM

Pace Project No.: 60233958

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60233958001	S-BMW-3D	EPA 200.7	458773	EPA 200.7	458836
60233958001	S-BMW-3D	EPA 200.8	458723	EPA 200.8	458750
60233958001	S-BMW-3D	EPA 7470	458785	EPA 7470	458813
60233958001	S-BMW-3D	EPA 903.1	245233		
60233958001	S-BMW-3D	EPA 904.0	245293		
60233958001	S-BMW-3D	SM 2540C	458809		
60233958001	S-BMW-3D	SM 4500-H+B	459374		
60233958001	S-BMW-3D	EPA 300.0	459810		
60233958001	S-BMW-3D	EPA 300.0	459964		

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Sample Condition Upon Receipt

WO#: 60233958



Client Name: Goldner

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 +0.7</sup> <sup>CF -0.5</sup> T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.6/1.8 Corr. Factor <sup>CF +0.7</sup> <sup>CF -0.5</sup> Corrected 1.3/1.2.5

Date and initials of person examining contents:

Temperature should be above freezing to 6°C

pvc 12/9/16

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Chain of Custody relinquished:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Short Hold Time analyses (<72hr):	<input type="checkbox"/> Yes <input 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 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 type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" 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: 12/9/16



# 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> <b>Required Client Information:</b>			<b>Section B</b> <b>Required Project Information:</b>			<b>Section C</b> <b>Invoice Information:</b>		
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:			Report To: Mark Haddock Copy To: Jeffrey Ingram Purchase Order No.: Project Name: Ameren Sioux Energy Center - Bottom Ash Project Number:			Attention: Company Name: Address: Pace Quote Reference: Project Manager: Jamie Church Pace Profile #: 9285 Regulatory Agency: NPDES <input type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> OTHER <input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/>		
<b>Section D</b> Required Client Information Valid Matrix Codes MATRIX CODE DW WT WW P SL OL WP AR OT TS DRINKING WATER WASTE WATER PRODUCT SOIL/SOLID OIL WIPE AIR OTHER TISSUE SAMPLE ID (A-Z, 0-9 / . -) Sample IDs MUST BE UNIQUE S-BMW-3D			Preservatives HCl HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> Unpreserved NaOH Na <sub>2</sub> O <sub>3</sub> Methanol Other Y/N ↑ Analysis Test ↑			Requested Analysis Filtered (Y/N)		
Matrix Code SAMPLE TYPE (G=GRAB C=COMP) COLLECTED COMPOSITE START DATE TIME COMPOSITE END/GRAB DATE TIME			# OF CONTAINERS SAMPLE TEMP AT COLLECTION			Date Project No. / Lab I.D. 18/03/16 18/01/16 25/01/16 001 Pace 19/1/16		
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 Jeff Ingram (SOLW) 12/18/16 12:30 Jeff Ingram / PACE 12/18/16 12:30 Jamie Church / PACE 12/18/16 17:00			Relinquished By / Affiliation Date TIME			Accepted By / Affiliation Date TIME		
Temp in C Received on Cooler (Y/N) Custody Sealed (Y/N) Samples Intact (Y/N) 13 Y 7 12.5 N Y X								

\*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.

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER: Jeff Ingram  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YY): 12/08/16

January 31, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60235473

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between January 05, 2017 and January 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.

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

Sincerely,



Richard Mannz for  
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-BOTT

Pace Project No.: 60235473

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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-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60235473001	S-BMW-1D	Water	01/03/17 11:21	01/05/17 05:45
60235473002	S-BMW-3D	Water	01/03/17 14:29	01/05/17 05:45
60235625001	S-UMW-1D	Water	01/05/17 10:33	01/07/17 03:40
60235625002	S-UMW-2D	Water	01/05/17 15:12	01/07/17 03:40
60235625003	S-UMW-3D	Water	01/05/17 15:20	01/07/17 03:40
60235625004	S-UMW-4D	Water	01/05/17 14:05	01/07/17 03:40
60235625005	S-UMW-5D	Water	01/05/17 14:15	01/07/17 03:40
60235625006	S-UMW-6D	Water	01/05/17 12:30	01/07/17 03:40
60235625007	S-UMW-DUP-1	Water	01/05/17 08:00	01/07/17 03:40
60235625008	S-UMW-FB-1	Water	01/05/17 14:02	01/07/17 03:40
60235625009	S-UMW-1D MS	Water	01/05/17 10:33	01/07/17 03:40
60235625010	S-UMW-1D MSD	Water	01/05/17 10:33	01/07/17 03:40

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60235473001	S-BMW-1D	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
60235473002	S-BMW-3D	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
60235625001	S-UMW-1D	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	JSS	1	PASI-K
		SM 4500-H+B	AGO	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60235625002	S-UMW-2D	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	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60235625003	S-UMW-3D	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

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60235625004	S-UMW-4D	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235625005	S-UMW-5D	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235625006	S-UMW-6D	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235625007	S-UMW-DUP-1	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60235625008	S-UMW-FB-1	SM 2540C	JSS	1	PASI-K
		SM 4500-H+B	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	SMW	8	PASI-K
		EPA 200.8	JGP	6	PASI-K

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		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	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
<b>60235625009</b>	<b>S-UMW-1D MS</b>	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
<b>60235625010</b>	<b>S-UMW-1D MSD</b>	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-BMW-1D**      **Lab ID: 60235473001**      Collected: 01/03/17 11:21      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>334</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:35	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:35	7440-41-7	
Boron	<b>170</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:35	7440-42-8	
Calcium	<b>135000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:35	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:35	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:35	7439-92-1	
Lithium	<b>15.1</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:35	7439-93-2	
Molybdenum	<b>0.75J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:35	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 14:27	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 14:27	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 14:27	7440-43-9	
Chromium	<b>0.42J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 14:27	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 14:27	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 14:27	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 15:36	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>460</b>	mg/L	5.0	5.0	1		01/06/17 10:45		
<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		01/10/17 11:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.6</b>	mg/L	1.0	0.50	1		01/21/17 14:41	16887-00-6	
Fluoride	<b>0.27</b>	mg/L	0.20	0.027	1		01/21/17 14:41	16984-48-8	
Sulfate	<b>38.8</b>	mg/L	5.0	0.77	5		01/22/17 15:23	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-BMW-3D**      **Lab ID: 60235473002**      Collected: 01/03/17 14:29      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>183</b>	ug/L	5.0	0.58	1	01/06/17 10:00	01/06/17 15:38	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/06/17 10:00	01/06/17 15:38	7440-41-7	
Boron	<b>76.2J</b>	ug/L	100	50.0	1	01/06/17 10:00	01/06/17 15:38	7440-42-8	
Calcium	<b>141000</b>	ug/L	100	8.1	1	01/06/17 10:00	01/06/17 15:38	7440-70-2	
Cobalt	<b>2.8J</b>	ug/L	5.0	0.72	1	01/06/17 10:00	01/06/17 15:38	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/06/17 10:00	01/06/17 15:38	7439-92-1	
Lithium	<b>7.9J</b>	ug/L	10.0	4.9	1	01/06/17 10:00	01/06/17 15:38	7439-93-2	
Molybdenum	<b>6.2J</b>	ug/L	20.0	0.52	1	01/06/17 10:00	01/06/17 15:38	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 14:31	7440-36-0	
Arsenic	<b>1.5</b>	ug/L	1.0	0.10	1	01/06/17 10:00	01/11/17 14:31	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/06/17 10:00	01/11/17 14:31	7440-43-9	
Chromium	<b>0.59J</b>	ug/L	1.0	0.34	1	01/06/17 10:00	01/11/17 14:31	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/06/17 10:00	01/11/17 14:31	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/06/17 10:00	01/11/17 14:31	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	01/12/17 09:55	01/12/17 15:37	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		01/06/17 10:46		
<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		01/11/17 11:49		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>11.2</b>	mg/L	1.0	0.50	1		01/21/17 14:55	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		01/21/17 14:55	16984-48-8	
Sulfate	<b>28.8</b>	mg/L	2.0	0.31	2		01/22/17 15:37	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-1D**      **Lab ID: 60235625001**      Collected: 01/05/17 10:33      Received: 01/07/17 03:40      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>146</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:02	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:02	7440-41-7	
Boron	<b>538</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:02	7440-42-8	
Calcium	<b>81300</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:02	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:02	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:02	7439-92-1	
Lithium	<b>13.5</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:02	7439-93-2	
Molybdenum	<b>40.9</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:02	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	01/10/17 13:15	01/11/17 17:30	7440-36-0	
Arsenic	<b>0.98J</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 17:30	7440-38-2	
Cadmium	<b>&lt;0.029</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 17:30	7440-43-9	
Chromium	<b>0.71J</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 17:30	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 17:30	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 17:30	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	01/17/17 15:50	01/18/17 09:37	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>374</b>	mg/L	5.0	5.0	1		01/09/17 16:01		
<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		01/17/17 14:07		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>23.2</b>	mg/L	2.0	1.0	2		01/22/17 09:44	16887-00-6	
Fluoride	<b>0.27</b>	mg/L	0.20	0.027	1		01/21/17 20:42	16984-48-8	
Sulfate	<b>85.6</b>	mg/L	10.0	1.5	10		01/22/17 10:30	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-2D**      **Lab ID: 60235625002**      Collected: 01/05/17 15:12      Received: 01/07/17 03:40      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>92.8</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:13	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:13	7440-41-7	
Boron	<b>14500</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:13	7440-42-8	
Calcium	<b>188000</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:13	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:13	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:13	7439-92-1	
Lithium	<b>29.7</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:13	7439-93-2	
Molybdenum	<b>1310</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:13	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	01/10/17 13:15	01/11/17 17:39	7440-36-0	
Arsenic	<b>1.4</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 17:39	7440-38-2	
Cadmium	<b>0.23J</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 17:39	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 17:39	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 17:39	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 17:39	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>0.059J</b>	ug/L	0.20	0.055	1	01/17/17 15:50	01/18/17 09:42	7439-97-6	B
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>885</b>	mg/L	5.0	5.0	1		01/09/17 16:03		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.0</b>	Std. Units	0.10	0.10	1		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>20.0</b>	mg/L	2.0	1.0	2		01/22/17 12:13	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.027	1		01/21/17 21:10	16984-48-8	
Sulfate	<b>477</b>	mg/L	50.0	7.7	50		01/22/17 12:29	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-3D**      **Lab ID: 60235625003**      Collected: 01/05/17 15:20      Received: 01/07/17 03:40      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>76.1</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:15	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:15	7440-41-7	
Boron	<b>21300</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:15	7440-42-8	
Calcium	<b>206000</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:15	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:15	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:15	7439-92-1	
Lithium	<b>18.4</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:15	7439-93-2	
Molybdenum	<b>3430</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:15	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	01/10/17 13:15	01/11/17 17:43	7440-36-0	
Arsenic	<b>0.14J</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 17:43	7440-38-2	
Cadmium	<b>0.79</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 17:43	7440-43-9	
Chromium	<b>0.35J</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 17:43	7440-47-3	
Selenium	<b>0.21J</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 17:43	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 17:43	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	01/17/17 15:50	01/18/17 09:47	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1020</b>	mg/L	5.0	5.0	1		01/09/17 16:03		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.0</b>	Std. Units	0.10	0.10	1		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>23.2</b>	mg/L	2.0	1.0	2		01/22/17 12:44	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.027	1		01/21/17 21:24	16984-48-8	
Sulfate	<b>531</b>	mg/L	50.0	7.7	50		01/22/17 13:00	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-4D**      **Lab ID: 60235625004**      Collected: 01/05/17 14:05      Received: 01/07/17 03:40      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>90.4</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:17	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:17	7440-41-7	
Boron	<b>28600</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:17	7440-42-8	
Calcium	<b>204000</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:17	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:17	7440-48-4	
Lead	<b>4.7J</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:17	7439-92-1	
Lithium	<b>44.2</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:17	7439-93-2	
Molybdenum	<b>7830</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:17	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	01/10/17 13:15	01/11/17 17:56	7440-36-0	
Arsenic	<b>&lt;0.10</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 17:56	7440-38-2	
Cadmium	<b>1.9</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 17:56	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 17:56	7440-47-3	
Selenium	<b>0.24J</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 17:56	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 17:56	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	01/17/17 15:50	01/18/17 09:48	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1120</b>	mg/L	5.0	5.0	1		01/09/17 16:04		
<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		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.9</b>	mg/L	2.0	1.0	2		01/22/17 13:15	16887-00-6	
Fluoride	<b>0.86</b>	mg/L	0.20	0.027	1		01/21/17 21:38	16984-48-8	
Sulfate	<b>550</b>	mg/L	50.0	7.7	50		01/22/17 13:30	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-5D**      **Lab ID: 60235625005**      Collected: 01/05/17 14:15      Received: 01/07/17 03:40      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>281</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:19	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:19	7440-41-7	
Boron	<b>5970</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:19	7440-42-8	
Calcium	<b>75800</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:19	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:19	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:19	7439-92-1	
Lithium	<b>28.4</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:19	7439-93-2	
Molybdenum	<b>254</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:19	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	01/10/17 13:15	01/11/17 18:01	7440-36-0	
Arsenic	<b>0.26J</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 18:01	7440-38-2	
Cadmium	<b>0.041J</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 18:01	7440-43-9	
Chromium	<b>0.62J</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 18:01	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 18:01	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 18:01	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	01/17/17 15:50	01/18/17 09:50	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>350</b>	mg/L	5.0	5.0	1		01/09/17 16:07		
<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		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>24.4</b>	mg/L	2.0	1.0	2		01/22/17 13:46	16887-00-6	
Fluoride	<b>0.56</b>	mg/L	0.20	0.027	1		01/21/17 21:52	16984-48-8	
Sulfate	<b>15.5</b>	mg/L	1.0	0.15	1		01/21/17 21:52	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-6D**      **Lab ID: 60235625006**      Collected: 01/05/17 12:30      Received: 01/07/17 03:40      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>119</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:21	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:21	7440-41-7	
Boron	<b>899</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:21	7440-42-8	
Calcium	<b>74900</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:21	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:21	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:21	7439-92-1	
Lithium	<b>12.2</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:21	7439-93-2	
Molybdenum	<b>110</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:21	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	01/10/17 13:15	01/11/17 18:05	7440-36-0	
Arsenic	<b>0.20J</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 18:05	7440-38-2	
Cadmium	<b>0.031J</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 18:05	7440-43-9	
Chromium	<b>0.70J</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 18:05	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 18:05	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 18:05	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	01/17/17 15:50	01/18/17 09:51	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>349</b>	mg/L	5.0	5.0	1		01/09/17 16:07		
<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		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>20.1</b>	mg/L	2.0	1.0	2		01/22/17 14:01	16887-00-6	
Fluoride	<b>0.38</b>	mg/L	0.20	0.027	1		01/21/17 22:06	16984-48-8	
Sulfate	<b>80.2</b>	mg/L	5.0	0.77	5		01/22/17 14:17	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-DUP-1**      **Lab ID: 60235625007**      Collected: 01/05/17 08:00      Received: 01/07/17 03:40      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>93.5</b>	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:24	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:24	7440-41-7	
Boron	<b>14600</b>	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:24	7440-42-8	
Calcium	<b>188000</b>	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:24	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:24	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:24	7439-92-1	
Lithium	<b>30.4</b>	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:24	7439-93-2	
Molybdenum	<b>1330</b>	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:24	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	01/10/17 13:15	01/11/17 18:10	7440-36-0	
Arsenic	<b>1.2</b>	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 18:10	7440-38-2	
Cadmium	<b>0.19J</b>	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 18:10	7440-43-9	
Chromium	<b>&lt;0.34</b>	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 18:10	7440-47-3	
Selenium	<b>&lt;0.18</b>	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 18:10	7782-49-2	
Thallium	<b>&lt;0.50</b>	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 18:10	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	01/17/17 15:50	01/18/17 09:52	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>916</b>	mg/L	5.0	5.0	1		01/09/17 16:08		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.0</b>	Std. Units	0.10	0.10	1		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.8</b>	mg/L	2.0	1.0	2		01/22/17 15:03	16887-00-6	
Fluoride	<b>1.1</b>	mg/L	0.20	0.027	1		01/21/17 22:48	16984-48-8	
Sulfate	<b>482</b>	mg/L	50.0	7.7	50		01/22/17 15:18	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-FB-1**      **Lab ID: 60235625008**      Collected: 01/05/17 14:02      Received: 01/07/17 03:40      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	<0.58	ug/L	5.0	0.58	1	01/10/17 13:15	01/12/17 18:26	7440-39-3	
Beryllium	<0.26	ug/L	1.0	0.26	1	01/10/17 13:15	01/12/17 18:26	7440-41-7	
Boron	<50.0	ug/L	100	50.0	1	01/10/17 13:15	01/12/17 18:26	7440-42-8	
Calcium	26.9J	ug/L	100	8.1	1	01/10/17 13:15	01/12/17 18:26	7440-70-2	
Cobalt	<0.72	ug/L	5.0	0.72	1	01/10/17 13:15	01/12/17 18:26	7440-48-4	
Lead	<2.5	ug/L	5.0	2.5	1	01/10/17 13:15	01/12/17 18:26	7439-92-1	
Lithium	<4.9	ug/L	10.0	4.9	1	01/10/17 13:15	01/12/17 18:26	7439-93-2	
Molybdenum	2.4J	ug/L	20.0	0.52	1	01/10/17 13:15	01/12/17 18:26	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	01/10/17 13:15	01/11/17 18:14	7440-36-0	
Arsenic	<0.10	ug/L	1.0	0.10	1	01/10/17 13:15	01/11/17 18:14	7440-38-2	
Cadmium	<0.029	ug/L	0.50	0.029	1	01/10/17 13:15	01/11/17 18:14	7440-43-9	
Chromium	0.44J	ug/L	1.0	0.34	1	01/10/17 13:15	01/11/17 18:14	7440-47-3	
Selenium	<0.18	ug/L	1.0	0.18	1	01/10/17 13:15	01/11/17 18:14	7782-49-2	
Thallium	<0.50	ug/L	1.0	0.50	1	01/10/17 13:15	01/11/17 18:14	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	01/17/17 15:50	01/18/17 09:54	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 16:08		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	8.3	Std. Units	0.10	0.10	1		01/10/17 00:00		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		01/21/17 23:01	16887-00-6	
Fluoride	<0.027	mg/L	0.20	0.027	1		01/21/17 23:01	16984-48-8	
Sulfate	<0.15	mg/L	1.0	0.15	1		01/21/17 23:01	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461806

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1890258

Matrix: Water

Associated Lab Samples: 60235473001, 60235473002

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		1890260		1890261		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec				
Mercury	ug/L	<0.055	5	5	5.5	5.4	110	108	75-125	2	20

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

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QC Batch: 462292 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

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METHOD BLANK: 1892597 Matrix: Water  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	0.11J	0.20	0.055	01/18/17 09:11	

LABORATORY CONTROL SAMPLE: 1892598

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: 1892599 1892600

Parameter	Units	60235624001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.070J	5	5	4.7	4.9	93	97	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1892601 1892602

Parameter	Units	60235625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.055	5	5	5.1	5.1	102	101	75-125	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60235473

QC Batch: 461335 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1888310 Matrix: Water  
Associated Lab Samples: 60235473001, 60235473002

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	60235457003		1888312		1888313		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD 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 CTR-BOTT

Pace Project No.: 60235473

MATRIX SPIKE SAMPLE: 1888314		60235457004	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% 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 CTR-BOTT  
 Pace Project No.: 60235473

QC Batch: 461572 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

METHOD BLANK: 1889317 Matrix: Water  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.58	5.0	0.58	01/12/17 17:25	
Beryllium	ug/L	<0.26	1.0	0.26	01/12/17 17:25	
Boron	ug/L	<50.0	100	50.0	01/12/17 17:25	
Calcium	ug/L	<8.1	100	8.1	01/12/17 17:25	
Cobalt	ug/L	<0.72	5.0	0.72	01/12/17 17:25	
Lead	ug/L	<2.5	5.0	2.5	01/12/17 17:25	
Lithium	ug/L	<4.9	10.0	4.9	01/12/17 17:25	
Molybdenum	ug/L	<0.52	20.0	0.52	01/12/17 17:25	

LABORATORY CONTROL SAMPLE: 1889318

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1000	100	85-115	
Beryllium	ug/L	1000	996	100	85-115	
Boron	ug/L	1000	954	95	85-115	
Calcium	ug/L	10000	9650	96	85-115	
Cobalt	ug/L	1000	1010	101	85-115	
Lead	ug/L	1000	1010	101	85-115	
Lithium	ug/L	1000	1020	102	85-115	
Molybdenum	ug/L	1000	994	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1889319 1889320

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60235624001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Barium	ug/L	357	1000	1000	1340	1340	99	98	70-130	1	20	
Beryllium	ug/L	<0.26	1000	1000	973	964	97	96	70-130	1	20	
Boron	ug/L	<50.0	1000	1000	1030	1020	99	98	70-130	1	20	
Calcium	ug/L	122000	10000	10000	129000	129000	71	78	70-130	1	20	
Cobalt	ug/L	<0.72	1000	1000	991	978	99	98	70-130	1	20	
Lead	ug/L	<2.5	1000	1000	992	971	99	97	70-130	2	20	
Lithium	ug/L	<4.9	1000	1000	1030	1020	103	102	70-130	1	20	
Molybdenum	ug/L	<0.52	1000	1000	1030	1020	103	101	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameter	Units	1889321		1889322		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60235625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							
Barium	ug/L	146	1000	1000	1210	1220	106	107	70-130	1	20	
Beryllium	ug/L	<0.26	1000	1000	1050	1060	105	106	70-130	1	20	
Boron	ug/L	538	1000	1000	1520	1550	98	101	70-130	2	20	
Calcium	ug/L	81300	10000	10000	89300	92200	80	109	70-130	3	20	
Cobalt	ug/L	<0.72	1000	1000	1010	1020	101	102	70-130	1	20	
Lead	ug/L	<2.5	1000	1000	1010	1020	101	101	70-130	1	20	
Lithium	ug/L	13.5	1000	1000	1110	1120	110	111	70-130	1	20	
Molybdenum	ug/L	40.9	1000	1000	1090	1100	105	105	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60235473

QC Batch: 461338 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1888324 Matrix: Water  
Associated Lab Samples: 60235473001, 60235473002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.055	1.0	0.055	01/11/17 13:23	
Arsenic	ug/L	<0.25	1.0	0.25	01/11/17 13:23	
Cadmium	ug/L	<0.082	0.50	0.082	01/11/17 13:23	
Chromium	ug/L	0.28J	1.0	0.16	01/11/17 13:23	
Selenium	ug/L	<0.12	1.0	0.12	01/11/17 13:23	
Thallium	ug/L	<0.052	1.0	0.052	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		60235457005		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.							
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	
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 CTR-BOTT

Pace Project No.: 60235473

QC Batch:	461613	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008		

METHOD BLANK:	1889506	Matrix:	Water
Associated Lab Samples:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.083J	1.0	0.055	01/11/17 16:12	
Arsenic	ug/L	<0.25	1.0	0.25	01/11/17 16:12	
Cadmium	ug/L	<0.082	0.50	0.082	01/11/17 16:12	
Chromium	ug/L	0.18J	1.0	0.16	01/11/17 16:12	
Selenium	ug/L	<0.12	1.0	0.12	01/11/17 16:12	
Thallium	ug/L	<0.052	1.0	0.052	01/11/17 16:12	

LABORATORY CONTROL SAMPLE: 1889507

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.3	101	85-115	
Arsenic	ug/L	40	38.7	97	85-115	
Cadmium	ug/L	40	40.5	101	85-115	
Chromium	ug/L	40	40.4	101	85-115	
Selenium	ug/L	40	40.2	101	85-115	
Thallium	ug/L	40	39.5	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1889508 1889509

Parameter	Units	60235624001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	<0.058	40	40	40.5	40.0	101	100	70-130	1	20		
Arsenic	ug/L	0.38J	40	40	39.0	38.1	97	94	70-130	2	20		
Cadmium	ug/L	<0.029	40	40	39.7	38.9	99	97	70-130	2	20		
Chromium	ug/L	0.62J	40	40	39.2	39.0	97	96	70-130	0	20		
Selenium	ug/L	<0.18	40	40	37.3	36.2	93	90	70-130	3	20		
Thallium	ug/L	<0.50	40	40	41.0	40.9	102	102	70-130	0	20		

MATRIX SPIKE SAMPLE: 1889510

Parameter	Units	60235625001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.058	40	40.6	101	70-130	
Arsenic	ug/L	0.98J	40	39.3	96	70-130	
Cadmium	ug/L	<0.029	40	39.6	99	70-130	
Chromium	ug/L	0.71J	40	39.2	96	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

MATRIX SPIKE SAMPLE:		1889510					
Parameter	Units	60235625001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	<0.18	40	37.6	94	70-130	
Thallium	ug/L	<0.50	40	40.3	101	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461337

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1888320

Matrix: Water

Associated Lab Samples: 60235473001, 60235473002

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 CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461527

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

METHOD BLANK: 1889118

Matrix: Water

Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

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 CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461465 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

SAMPLE DUPLICATE: 1888952

Parameter	Units	60235624001 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 CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461546 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60235473001

SAMPLE DUPLICATE: 1889186

Parameter	Units	60235246002 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	4.7	4.7	0	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 461642 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60235473002

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 CTR-BOTT

Pace Project No.: 60235473

QC Batch: 462105 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60235625001

SAMPLE DUPLICATE: 1892038

Parameter	Units	60235625001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.2	7.6	5	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60235473

QC Batch: 462745 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1894695 Matrix: Water  
Associated Lab Samples: 60235473001, 60235473002

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	

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	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1894697 1894698

Parameter	Units	60235457001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
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 CTR-BOTT  
Pace Project No.: 60235473

QC Batch: 462746 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

METHOD BLANK: 1894700 Matrix: Water  
Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/21/17 16:04	
Fluoride	mg/L	<0.027	0.20	0.027	01/21/17 16:04	
Sulfate	mg/L	<0.15	1.0	0.15	01/21/17 16:04	

LABORATORY CONTROL SAMPLE: 1894701

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	2.7	107	90-110	
Sulfate	mg/L	5	5.1	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1894702 1894703

Parameter	Units	60235624001		1894703		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/L	0.25	2.5	2.5	3.0	3.0	110	112	80-120	1	15

MATRIX SPIKE SAMPLE: 1894704

Parameter	Units	60235625001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.27	2.5	3.1	114	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60235473

QC Batch: 462784 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1895026 Matrix: Water  
Associated Lab Samples: 60235473001, 60235473002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
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
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1895028 1895029

Parameter	Units	60235457003		1895028		1895029		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result				
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
Sulfate	mg/L	104	50	160	111	80-120	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 462785 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007

METHOD BLANK: 1895031 Matrix: Water  
 Associated Lab Samples: 60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/22/17 08:59	
Sulfate	mg/L	<0.15	1.0	0.15	01/22/17 08:59	

LABORATORY CONTROL SAMPLE: 1895032

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1895033 1895034

Parameter	Units	60235625001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	23.2	10	10	34.5	34.3	113	110	80-120	1	15	
Sulfate	mg/L	85.6	50	50	140	141	110	111	80-120	1	15	

MATRIX SPIKE SAMPLE: 1895035

Parameter	Units	60236411003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	ND	100	119	100	80-120	
Sulfate	mg/L	176	100	286	110	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.324 ± 0.451 (0.753)</b> C:NA T:90%	pCi/L	01/28/17 11:49	13982-63-3	
Radium-228	EPA 904.0	<b>0.695 ± 0.426 (0.792)</b> C:59% T:94%	pCi/L	01/30/17 16:08	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-BMW-3D**      **Lab ID: 60235473002**      Collected: 01/03/17 14:29      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>0.000 ± 0.453 (0.982)</b> C:NA T:91%	pCi/L	01/28/17 11:49	13982-63-3	
Radium-228	EPA 904.0	<b>0.158 ± 0.349 (0.776)</b> C:55% T:89%	pCi/L	01/30/17 16:08	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.340 (0.693)</b> C:NA T:95%	pCi/L	01/28/17 19:55	13982-63-3	
Radium-228	EPA 904.0	<b>0.529 ± 0.451 (0.914)</b> C:68% T:83%	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-2D**      **Lab ID: 60235625002**      Collected: 01/05/17 15:12      Received: 01/07/17 03:40      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>0.0806 ± 0.368 (0.593)</b> C:NA T:85%	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.217 ± 0.422 (0.927)</b> C:65% T:74%	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0739 ± 0.435 (0.888)</b> C:NA T:94%	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.0321 ± 0.401 (0.924)</b> C:62% T:84%	pCi/L	01/30/17 18:27	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-UMW-4D</b> <b>Lab ID: 60235625004</b> Collected: 01/05/17 14:05      Received: 01/07/17 03:40      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>0.161 ± 0.367 (0.592)</b> <b>C:NA T:90%</b>	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.497 ± 0.404 (0.803)</b> <b>C:72% T:78%</b>	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.377 (0.845)</b> <b>C:NA T:89%</b>	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.289 ± 0.324 (0.677)</b> <b>C:73% T:91%</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 CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.236 ± 0.360 (0.578)</b> C:NA T:87%	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.453 ± 0.445 (0.918)</b> C:67% T:79%	pCi/L	01/30/17 18:27	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-DUP-1**      **Lab ID: 60235625007**      Collected: 01/05/17 08:00      Received: 01/07/17 03:40      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>0.155 ± 0.373 (0.720)</b> C:NA T:87%	pCi/L	01/28/17 20:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.816 ± 0.462 (0.837)</b> C:71% T:74%	pCi/L	01/30/17 18:29	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

**Sample: S-UMW-FB-1**      **Lab ID: 60235625008**      Collected: 01/05/17 14:02      Received: 01/07/17 03:40      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>-0.076 ± 0.348 (0.707)</b> <b>C:NA T:93%</b>	pCi/L	01/28/17 21:02	13982-63-3	
Radium-228	EPA 904.0	<b>0.277 ± 0.380 (0.812)</b> <b>C:63% T:89%</b>	pCi/L	01/30/17 18:29	15262-20-1	

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Sample: S-UMW-1D MS		Lab ID: 60235625009	Collected: 01/05/17 10:33	Received: 01/07/17 03:40	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>101 %REC +/- NA (NA)</b>		pCi/L	01/28/17 20:51	13982-63-3	
		<b>C:NA T:NA</b>					
Radium-228	EPA 904.0	<b>82.0 %REC +/- NA (NA)</b>		pCi/L	01/30/17 18:29	15262-20-1	
		<b>C:NA T:NA</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>105 %REC 4.35 RPD +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	01/28/17 20:51	13982-63-3	
Radium-228	EPA 904.0	<b>103 %REC 22.0 RPD +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	01/30/17 18:29	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 246431 Analysis Method: EPA 903.1

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

Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1211778 Matrix: Water

Associated Lab Samples: 60235473001, 60235473002

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.

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

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QC Batch:	246435	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008, 60235625009, 60235625010		

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METHOD BLANK:	1211782	Matrix:	Water
Associated Lab Samples:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008, 60235625009, 60235625010		

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 CTR-BOTT

Pace Project No.: 60235473

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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:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008, 60235625009, 60235625010		

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METHOD BLANK:	1211783	Matrix:	Water
Associated Lab Samples:	60235625001, 60235625002, 60235625003, 60235625004, 60235625005, 60235625006, 60235625007, 60235625008, 60235625009, 60235625010		

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	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

QC Batch: 246432 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60235473001, 60235473002

METHOD BLANK: 1211779 Matrix: Water

Associated Lab Samples: 60235473001, 60235473002

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 CTR-BOTT

Pace Project No.: 60235473

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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

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 CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60235473001	S-BMW-1D	EPA 200.7	461335	EPA 200.7	461385
60235473002	S-BMW-3D	EPA 200.7	461335	EPA 200.7	461385
60235625001	S-UMW-1D	EPA 200.7	461572	EPA 200.7	461636
60235625002	S-UMW-2D	EPA 200.7	461572	EPA 200.7	461636
60235625003	S-UMW-3D	EPA 200.7	461572	EPA 200.7	461636
60235625004	S-UMW-4D	EPA 200.7	461572	EPA 200.7	461636
60235625005	S-UMW-5D	EPA 200.7	461572	EPA 200.7	461636
60235625006	S-UMW-6D	EPA 200.7	461572	EPA 200.7	461636
60235625007	S-UMW-DUP-1	EPA 200.7	461572	EPA 200.7	461636
60235625008	S-UMW-FB-1	EPA 200.7	461572	EPA 200.7	461636
60235473001	S-BMW-1D	EPA 200.8	461338	EPA 200.8	461386
60235473002	S-BMW-3D	EPA 200.8	461338	EPA 200.8	461386
60235625001	S-UMW-1D	EPA 200.8	461613	EPA 200.8	461637
60235625002	S-UMW-2D	EPA 200.8	461613	EPA 200.8	461637
60235625003	S-UMW-3D	EPA 200.8	461613	EPA 200.8	461637
60235625004	S-UMW-4D	EPA 200.8	461613	EPA 200.8	461637
60235625005	S-UMW-5D	EPA 200.8	461613	EPA 200.8	461637
60235625006	S-UMW-6D	EPA 200.8	461613	EPA 200.8	461637
60235625007	S-UMW-DUP-1	EPA 200.8	461613	EPA 200.8	461637
60235625008	S-UMW-FB-1	EPA 200.8	461613	EPA 200.8	461637
60235473001	S-BMW-1D	EPA 7470	461806	EPA 7470	461843
60235473002	S-BMW-3D	EPA 7470	461806	EPA 7470	461843
60235625001	S-UMW-1D	EPA 7470	462292	EPA 7470	462306
60235625002	S-UMW-2D	EPA 7470	462292	EPA 7470	462306
60235625003	S-UMW-3D	EPA 7470	462292	EPA 7470	462306
60235625004	S-UMW-4D	EPA 7470	462292	EPA 7470	462306
60235625005	S-UMW-5D	EPA 7470	462292	EPA 7470	462306
60235625006	S-UMW-6D	EPA 7470	462292	EPA 7470	462306
60235625007	S-UMW-DUP-1	EPA 7470	462292	EPA 7470	462306
60235625008	S-UMW-FB-1	EPA 7470	462292	EPA 7470	462306
60235473001	S-BMW-1D	EPA 903.1	246431		
60235473002	S-BMW-3D	EPA 903.1	246431		
60235625001	S-UMW-1D	EPA 903.1	246435		
60235625002	S-UMW-2D	EPA 903.1	246435		
60235625003	S-UMW-3D	EPA 903.1	246435		
60235625004	S-UMW-4D	EPA 903.1	246435		
60235625005	S-UMW-5D	EPA 903.1	246435		
60235625006	S-UMW-6D	EPA 903.1	246435		
60235625007	S-UMW-DUP-1	EPA 903.1	246435		
60235625008	S-UMW-FB-1	EPA 903.1	246435		
60235625009	S-UMW-1D MS	EPA 903.1	246435		
60235625010	S-UMW-1D MSD	EPA 903.1	246435		
60235473001	S-BMW-1D	EPA 904.0	246432		
60235473002	S-BMW-3D	EPA 904.0	246432		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60235625001	S-UMW-1D	EPA 904.0	246436		
60235625002	S-UMW-2D	EPA 904.0	246436		
60235625003	S-UMW-3D	EPA 904.0	246436		
60235625004	S-UMW-4D	EPA 904.0	246436		
60235625005	S-UMW-5D	EPA 904.0	246436		
60235625006	S-UMW-6D	EPA 904.0	246436		
60235625007	S-UMW-DUP-1	EPA 904.0	246436		
60235625008	S-UMW-FB-1	EPA 904.0	246436		
60235625009	S-UMW-1D MS	EPA 904.0	246436		
60235625010	S-UMW-1D MSD	EPA 904.0	246436		
60235473001	S-BMW-1D	SM 2540C	461337		
60235473002	S-BMW-3D	SM 2540C	461337		
60235625001	S-UMW-1D	SM 2540C	461527		
60235625002	S-UMW-2D	SM 2540C	461527		
60235625003	S-UMW-3D	SM 2540C	461527		
60235625004	S-UMW-4D	SM 2540C	461527		
60235625005	S-UMW-5D	SM 2540C	461527		
60235625006	S-UMW-6D	SM 2540C	461527		
60235625007	S-UMW-DUP-1	SM 2540C	461527		
60235625008	S-UMW-FB-1	SM 2540C	461527		
60235473001	S-BMW-1D	SM 4500-H+B	461546		
60235473002	S-BMW-3D	SM 4500-H+B	461642		
60235625001	S-UMW-1D	SM 4500-H+B	462105		
60235625002	S-UMW-2D	SM 4500-H+B	461465		
60235625003	S-UMW-3D	SM 4500-H+B	461465		
60235625004	S-UMW-4D	SM 4500-H+B	461465		
60235625005	S-UMW-5D	SM 4500-H+B	461465		
60235625006	S-UMW-6D	SM 4500-H+B	461465		
60235625007	S-UMW-DUP-1	SM 4500-H+B	461465		
60235625008	S-UMW-FB-1	SM 4500-H+B	461465		
60235473001	S-BMW-1D	EPA 300.0	462745		
60235473001	S-BMW-1D	EPA 300.0	462784		
60235473002	S-BMW-3D	EPA 300.0	462745		
60235473002	S-BMW-3D	EPA 300.0	462784		
60235625001	S-UMW-1D	EPA 300.0	462746		
60235625001	S-UMW-1D	EPA 300.0	462785		
60235625002	S-UMW-2D	EPA 300.0	462746		
60235625002	S-UMW-2D	EPA 300.0	462785		
60235625003	S-UMW-3D	EPA 300.0	462746		
60235625003	S-UMW-3D	EPA 300.0	462785		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60235473

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60235625004	S-UMW-4D	EPA 300.0	462746		
60235625004	S-UMW-4D	EPA 300.0	462785		
60235625005	S-UMW-5D	EPA 300.0	462746		
60235625005	S-UMW-5D	EPA 300.0	462785		
60235625006	S-UMW-6D	EPA 300.0	462746		
60235625006	S-UMW-6D	EPA 300.0	462785		
60235625007	S-UMW-DUP-1	EPA 300.0	462746		
60235625007	S-UMW-DUP-1	EPA 300.0	462785		
60235625008	S-UMW-FB-1	EPA 300.0	462746		

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Sample Condition Upon Receipt

WO#: 60235473



60235473

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 3.2/11.4 Corr. Factor CF +0.7 / CF +0.9 Corrected 3.9/12.1

BSB 1/5/17  
Date and initials of person examining contents:

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
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	<u>- SAMPLE S-BMW-3D on coc has</u>
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>a container label that has</u>
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>been attached to each</u>
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>S-BMW-3S collected @ 1520</u>
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>- pre printed portion of label says</u>
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	<u>sample is from Bottom Ash</u>
Sample labels match COC: Date / time / ID / analyses	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	<u>site</u>
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>- The hand written ID/time is</u>
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	<u>a matrix for a sample on</u>
Cyanide water sample checks: <input type="checkbox"/> N/A		<u>Fly Ash Coc.</u>
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	<u>- possible mix up.</u>
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: Jamie Chok \_\_\_\_\_ 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.

Page: 1 of 1

**Section A**

Required Client Information:  
 Company: Goldex 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 - Bottom Ash  
 Project Number: 153-1406.0003A

**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			COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	PRESERVATIVES		# OF CONTAINERS		Analysis Test ↑ Y/N ↓	Requested Analysis Filtered (Y/N)						Temp in °C	Received on Cooler (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)								
	MATRIX	DRINKING WATER	WASTE-WATER	COMPOSITE START	COMPOSITE END/GRAB		Unpreserved	H2SO4	HNO3	HCl		NaOH	Na2S2O3	Methanol	Other	Metals*	Chloride/Fluoride/Sulfate					TDS	pH	Radium 226 & 228	Residual Chlorine (Y/N)				
1	S-UWW-1D					G																							
2	S-UWW-2B					G																							
3	S-UWW-3B					G																							
4	S-UWW-4D					G																							
5	S-UWW-5B					G																							
6	S-UWW-6B					G																							
7	S-BMWW-1D					G																							
8	S-BMWW-3D					G																							
9	S-UWW-EDDP-1					G																							
10	S-UWW-FB-1					G																							
11																													
12																													
<b>ADDITIONAL COMMENTS</b>												RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	<b>SAMPLE CONDITIONS</b>											
*EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg												<u>John Swartz/Golder</u>	<u>1/4/17</u>	<u>1620</u>	<u>Golder</u>	<u>1/4/17</u>	<u>16:36</u>	<u>Golder</u>	<u>054539</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>					
EPA 200.8: Sb, As, Cd, Cr, Se, Ti												<u>Goldex Associates</u>	<u>1/4/17</u>	<u>1700</u>	<u>Goldex Associates</u>	<u>1/4/17</u>	<u>radium</u>	<u>1211</u>	<u>N</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>	<u>Y</u>						

**SAMPLER NAME AND SIGNATURE**

PRINT Name of SAMPLER: John Swartz

SIGNATURE of SAMPLER: *[Signature]*

DATE Signed (MM/DD/YYYY): 1/4/17



Sample Condition Upon Receipt

WO#: 60235625
Barcode: 60235625

Client Name: Golden

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-268 / T-239 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 7.0 10.4 Corr. Factor CF +0.7 CF +0.9 Corrected 2.9 11.1 7.3

Date and initials of person examining contents: 1/2/17

Temperature should be above freezing to 6°C 2-2

Table with 3 columns: Question, Yes/No/N/A checkboxes, and Notes. Rows include Chain of Custody, Short Hold Time analyses (<72hr): pH, Rush Turn Around Time, Containers, and various sample handling checks.

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 1/9/17 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 - Bottom Ash**  
 Project Number: **153-1406.0003A**

### 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	MATRIX 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)	Pace Project No./ Lab I.D.													
	MATRIX	CODE			COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	H2O4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Y									N	Y	N	Y	N	Y	N						
1	S-UMWW-1D	WT	G	11/5/17	1033			12	3	9														60255625	60255625	60255625													
2	S-UMWW-2D	WT	G		1512			4	1	3																													
3	S-UMWW-3D	WT	G		1520																																		
4	S-UMWW-4D	WT	G		1405																																		
5	S-UMWW-5D	WT	G		1415																																		
6	S-UMWW-6D	WT	G		1230																																		
7	S-UMWW-7D	WT	G																																				
8	S-UMWW-8B	WT	G																																				
9	S-UMWW-DUP-1	WT	G	11/5/17	-			4	1	3																													
10	S-UMWW-FB-1	WT	G		1402			4	1	3																													
11																																							
12																																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS		
									Received on Ice (Y/N)	Custody Sealed (Y/N)	Samples Intact (Y/N)
*EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg EPA 200.8: Sb, As, Cd, Cr, Se, Tl	John Lortz/Golder		11/6/17	7:30	[Signature]	[Signature]	10/17/17	0340	7-9	Y	Y
							11/17/17		11.1	Y	Y
									2-9	Y	Y

ITEM #	Valid Matrix Codes		MATRIX CODE	MATRIX 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)	Pace Project No./ Lab I.D.													
	MATRIX	CODE			COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	H2O4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Y									N	Y	N	Y	N	Y	N	Y	N				
1	S-UMWW-1D	WT	G	11/5/17	1033			12	3	9														60255625	60255625	60255625													
2	S-UMWW-2D	WT	G		1512			4	1	3																													
3	S-UMWW-3D	WT	G		1520																																		
4	S-UMWW-4D	WT	G		1405																																		
5	S-UMWW-5D	WT	G		1415																																		
6	S-UMWW-6D	WT	G		1230																																		
7	S-UMWW-7D	WT	G																																				
8	S-UMWW-8B	WT	G																																				
9	S-UMWW-DUP-1	WT	G	11/5/17	-			4	1	3																													
10	S-UMWW-FB-1	WT	G		1402			4	1	3																													
11																																							
12																																							

March 03, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60238979

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.

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-BOTT

Pace Project No.: 60238979

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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-BOTT

Pace Project No.: 60238979

---

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60237185001	S-BMW-3D	Water	02/02/17 10:30	02/03/17 03:55

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60237185001	S-BMW-3D	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

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

**Sample: S-BMW-3D**      **Lab ID: 60237185001**      Collected: 02/02/17 10:30      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>650</b>	ug/L	5.0	0.58	1	02/03/17 16:15	02/06/17 16:21	7440-39-3	
Beryllium	<b>&lt;0.26</b>	ug/L	1.0	0.26	1	02/03/17 16:15	02/06/17 16:21	7440-41-7	
Boron	<b>&lt;50.0</b>	ug/L	100	50.0	1	02/03/17 16:15	02/06/17 16:21	7440-42-8	
Calcium	<b>106000</b>	ug/L	100	8.1	1	02/03/17 16:15	02/06/17 16:21	7440-70-2	
Cobalt	<b>&lt;0.72</b>	ug/L	5.0	0.72	1	02/03/17 16:15	02/06/17 16:21	7440-48-4	
Lead	<b>&lt;2.5</b>	ug/L	5.0	2.5	1	02/03/17 16:15	02/06/17 16:21	7439-92-1	
Lithium	<b>20.0</b>	ug/L	10.0	4.9	1	02/03/17 16:15	02/06/17 16:21	7439-93-2	
Molybdenum	<b>&lt;0.52</b>	ug/L	20.0	0.52	1	02/03/17 16:15	02/06/17 16:21	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	0.026	1	02/08/17 11:30	02/13/17 12:23	7440-36-0	B
Arsenic	<b>&lt;0.052</b>	ug/L	1.0	0.052	1	02/08/17 11:30	02/13/17 12:23	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	02/08/17 11:30	02/13/17 12:23	7440-43-9	
Chromium	<b>0.61J</b>	ug/L	1.0	0.054	1	02/08/17 11:30	02/13/17 12:23	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	02/08/17 11:30	02/13/17 12:23	7782-49-2	
Thallium	<b>0.082J</b>	ug/L	1.0	0.036	1	02/08/17 11:30	02/13/17 12:23	7440-28-0	
<b>7470 Mercury</b>		Analytical Method: EPA 7470    Preparation Method: EPA 7470							
Mercury	<b>0.066J</b>	ug/L	0.20	0.039	1	02/06/17 09:45	02/06/17 13:15	7439-97-6	B
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>402</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>7.5</b>	Std. Units	0.10	0.10	1		02/13/17 12:42		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		02/04/17 16:39	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.027	1		02/04/17 16:39	16984-48-8	
Sulfate	<b>20.0</b>	mg/L	2.0	0.31	2		02/04/17 16:53	14808-79-8	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

QC Batch: 464462

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60237185001

METHOD BLANK: 1901187

Matrix: Water

Associated Lab Samples: 60237185001

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		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec						
Mercury	ug/L	0.12J	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 CTR-BOTT

Pace Project No.: 60238979

QC Batch: 464383

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60237185001

METHOD BLANK: 1900682

Matrix: Water

Associated Lab Samples: 60237185001

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	Max RPD	Qual
		Result	MS Spike Conc.	Spike Conc.	MS Result	MSD Result	% Rec	% 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	

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-BOTT

Pace Project No.: 60238979

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	

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-BOTT  
Pace Project No.: 60238979

QC Batch: 464778 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60237185001

METHOD BLANK: 1902182 Matrix: Water  
Associated Lab Samples: 60237185001

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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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

QC Batch: 464737

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60237185001

METHOD BLANK: 1902098

Matrix: Water

Associated Lab Samples: 60237185001

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 CTR-BOTT

Pace Project No.: 60238979

QC Batch: 464959 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60237185001

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 CTR-BOTT

Pace Project No.: 60238979

QC Batch: 464392

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60237185001

METHOD BLANK: 1900744

Matrix: Water

Associated Lab Samples: 60237185001

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	

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### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.773 ± 0.694 (1.05)</b> <b>C:NA T:82%</b>	pCi/L	02/28/17 10:10	13982-63-3	
Radium-228	EPA 904.0	<b>1.16 ± 0.522 (0.868)</b> <b>C:63% T:81%</b>	pCi/L	03/01/17 19:19	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

QC Batch: 249802

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60237185001

METHOD BLANK: 1229201

Matrix: Water

Associated Lab Samples: 60237185001

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	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

QC Batch: 249956

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60237185001

METHOD BLANK: 1229809

Matrix: Water

Associated Lab Samples: 60237185001

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	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60238979

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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

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-BOTT

Pace Project No.: 60238979

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60237185001	S-BMW-3D	EPA 200.7	464383	EPA 200.7	464444
60237185001	S-BMW-3D	EPA 200.8	464778	EPA 200.8	464815
60237185001	S-BMW-3D	EPA 7470	464462	EPA 7470	464469
60237185001	S-BMW-3D	EPA 903.1	249802		
60237185001	S-BMW-3D	EPA 904.0	249956		
60237185001	S-BMW-3D	SM 2540C	464737		
60237185001	S-BMW-3D	SM 4500-H+B	464959		
60237185001	S-BMW-3D	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.

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.: FLYASH + Bottom Ash  
Project Name: Ameren Sioux Energy Center - JWIL  
Project Number: 153-1406.0003B + 0003A

Section C  
Invoice Information:  
Attention:  
Company Name:  
Address:  
REGULATORY AGENCY: NPDES, RCRA, DRINKING WATER, OTHER  
Site Location: MO  
STATE: MO  
Face Quote Reference: Jamie Church  
Face Project Manager: Jamie Church  
Face Profile #: 9285

Page: 7 of 7

ITEM #	Valid Matrix Codes MATRIX CODE DW WT WW P SL OL WP AT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	DATE	TIME	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
		COMPOSITE START	COMPOSITE END/GRAB										
1	S-BMW-3D			G	WT	2/17	1030	2/17	1215	John Wozniak/Golder	2/17	12:15	Y
2	S-BMW-3S			G	WT	2/17	1122	2/17	17:30	Richard Ingram	2/17	17:30	Y
3				G	WT								
4				G	WT								
5				G	WT								
6				G	WT								
7				G	WT								
8				G	WT								
9				G	WT								
10				G	WT								
11				G	WT								
12				G	WT								

ITEM #	Requested Analysis Filtered (Y/N)	Analysis Test	Y/N	Temp in °C	Received on	Sealed Cooler	Samples Intact
1		Metals*	Y				
1		Chloride/Fluoride/Sulfate	Y				
1		TDS	Y				
1		pH	Y				
1		Radium 226 & 228	Y				
1		Residual Chlorine (Y/N)					

Requested Analysis Filtered (Y/N)

Analysis Test

Y/N

Temp in °C

Received on

Sealed Cooler

Samples Intact

SAMPLER NAME AND SIGNATURE: John Wozniak

PRINT Name of SAMPLER: John Wozniak

SIGNATURE of SAMPLER: [Signature]

DATE Signed (MM/DD/YYYY): 02/02/17

April 03, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60239429

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on March 10, 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-BOTT

Pace Project No.: 60239429

---

### 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-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60239429001	S-UMW-1D	Water	03/09/17 13:43	03/10/17 03:45
60239429002	S-UMW-2D	Water	03/09/17 11:04	03/10/17 03:45
60239429003	S-UMW-3D	Water	03/09/17 09:43	03/10/17 03:45
60239429004	S-UMW-4D	Water	03/09/17 08:48	03/10/17 03:45
60239429005	S-UMW-5D	Water	03/08/17 14:05	03/10/17 03:45
60239429006	S-UMW-6D	Water	03/08/17 14:48	03/10/17 03:45
60239429007	S-BMW-1D	Water	03/08/17 10:37	03/10/17 03:45
60239429008	S-BMW-3D	Water	03/08/17 12:02	03/10/17 03:45
60239429009	S-UMW-DUP-1	Water	03/09/17 08:00	03/10/17 03:45
60239429010	S-UMW-FB-1	Water	03/08/17 14:00	03/10/17 03:45
60239429011	S-UMW-1D MS	Water	03/09/17 13:43	03/10/17 03:45
60239429012	S-UMW-1D MSD	Water	03/09/17 13:43	03/10/17 03:45

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60239429001	S-UMW-1D	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	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60239429002	S-UMW-2D	EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60239429003	S-UMW-3D	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
60239429004	S-UMW-4D	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
60239429005	S-UMW-5D	EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		EPA 904.0	JJY	1	PASI-PA
		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	JJY	1	PASI-PA	

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60239429006	S-UMW-6D	SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
60239429007	S-BMW-1D	SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
60239429008	S-BMW-3D	EPA 300.0	OL	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	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60239429009	S-UMW-DUP-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	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	SMW	8	PASI-K
60239429010	S-UMW-FB-1	EPA 200.8	JGP	6	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	TDS	1	PASI-K
		EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
		SM 2540C	LDF	1	PASI-K
		SM 4500-H+B	JSS	1	PASI-K
		EPA 300.0	OL	3	PASI-K
<b>60239429011</b>	<b>S-UMW-1D MS</b>	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA
<b>60239429012</b>	<b>S-UMW-1D MSD</b>	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	JJY	1	PASI-PA

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-1D**      **Lab ID: 60239429001**      Collected: 03/09/17 13:43      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>123</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:24	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:24	7440-41-7	
Boron	<b>325</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:24	7440-42-8	
Calcium	<b>71600</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:24	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:24	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:24	7439-92-1	
Lithium	<b>10.1</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:24	7439-93-2	
Molybdenum	<b>35.7</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:24	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.041J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 14:45	7440-36-0	
Arsenic	<b>1.1</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 14:45	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 14:45	7440-43-9	
Chromium	<b>1.5</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 14:45	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 14:45	7782-49-2	
Thallium	<b>0.17J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 14:45	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 13:00	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>314</b>	mg/L	5.0	5.0	1		03/14/17 11:20		
<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		03/13/17 15:02		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>18.8</b>	mg/L	2.0	1.0	2		03/14/17 12:35	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.10	1		03/14/17 11:55	16984-48-8	
Sulfate	<b>51.0</b>	mg/L	5.0	2.5	5		03/14/17 13:42	14808-79-8	M1

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-2D**      **Lab ID: 60239429002**      Collected: 03/09/17 11:04      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>131</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:30	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:30	7440-41-7	
Boron	<b>25200</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:30	7440-42-8	
Calcium	<b>302000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:30	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:30	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:30	7439-92-1	
Lithium	<b>30.2</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:30	7439-93-2	
Molybdenum	<b>1880</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:30	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8      Preparation Method: EPA 200.8							
Antimony	<b>0.048J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 14:54	7440-36-0	
Arsenic	<b>2.1</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 14:54	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 14:54	7440-43-9	
Chromium	<b>1.7</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 14:54	7440-47-3	B
Selenium	<b>0.12J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 14:54	7782-49-2	
Thallium	<b>0.25J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 14:54	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 13:07	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1380</b>	mg/L	5.0	5.0	1		03/13/17 15:24		
<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		03/13/17 14:57		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>18.9</b>	mg/L	1.0	0.50	1		03/14/17 14:22	16887-00-6	
Fluoride	<b>0.72</b>	mg/L	0.20	0.10	1		03/14/17 14:22	16984-48-8	
Sulfate	<b>738</b>	mg/L	100	50.0	100		03/14/17 14:49	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-3D**      **Lab ID: 60239429003**      Collected: 03/09/17 09:43      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>79.8</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:32	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:32	7440-41-7	
Boron	<b>25000</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:32	7440-42-8	
Calcium	<b>236000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:32	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:32	7440-48-4	
Lead	<b>2.8J</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:32	7439-92-1	
Lithium	<b>14.9</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:32	7439-93-2	
Molybdenum	<b>4120</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:32	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 14:57	7440-36-0	
Arsenic	<b>0.45J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 14:57	7440-38-2	B
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 14:57	7440-43-9	
Chromium	<b>0.56J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 14:57	7440-47-3	B
Selenium	<b>0.12J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 14:57	7782-49-2	
Thallium	<b>0.084J</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 14:57	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	03/15/17 09:30	03/15/17 13:09	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1090</b>	mg/L	5.0	5.0	1		03/13/17 15:24		
<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		03/13/17 14:53		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>21.6</b>	mg/L	2.0	1.0	2		03/14/17 15:29	16887-00-6	
Fluoride	<b>0.99</b>	mg/L	0.20	0.10	1		03/14/17 15:16	16984-48-8	
Sulfate	<b>603</b>	mg/L	50.0	25.0	50		03/14/17 16:10	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-4D**      **Lab ID: 60239429004**      Collected: 03/09/17 08:48      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	71.2	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:35	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:35	7440-41-7	
Boron	23000	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:35	7440-42-8	
Calcium	181000	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:35	7440-70-2	
Cobalt	<0.73	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:35	7440-48-4	
Lead	<2.4	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:35	7439-92-1	
Lithium	34.4	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:35	7439-93-2	
Molybdenum	6480	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:35	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 15:00	7440-36-0	
Arsenic	0.27J	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:00	7440-38-2	B
Cadmium	<0.018	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:00	7440-43-9	
Chromium	0.90J	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:00	7440-47-3	B
Selenium	0.20J	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 15:00	7782-49-2	
Thallium	0.046J	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:00	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	03/15/17 09:30	03/15/17 13:16	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	1010	mg/L	5.0	5.0	1		03/13/17 15:25		
<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		03/13/17 14:44		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	24.1	mg/L	2.0	1.0	2		03/14/17 16:36	16887-00-6	
Fluoride	0.63	mg/L	0.20	0.10	1		03/14/17 16:23	16984-48-8	
Sulfate	484	mg/L	50.0	25.0	50		03/14/17 16:50	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-5D**      **Lab ID: 60239429005**      Collected: 03/08/17 14:05      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>248</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:37	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:37	7440-41-7	
Boron	<b>2990</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:37	7440-42-8	
Calcium	<b>71500</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:37	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:37	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:37	7439-92-1	
Lithium	<b>21.5</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:37	7439-93-2	
Molybdenum	<b>242</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:37	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 15:03	7440-36-0	
Arsenic	<b>0.42J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:03	7440-38-2	B
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:03	7440-43-9	
Chromium	<b>0.74J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:03	7440-47-3	B
Selenium	<b>0.091J</b>	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 15:03	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:03	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	03/15/17 09:30	03/15/17 13:18	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>331</b>	mg/L	5.0	5.0	1		03/13/17 13:34		
<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		03/13/17 12:29		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>26.0</b>	mg/L	2.0	1.0	2		03/14/17 17:17	16887-00-6	
Fluoride	<b>0.47</b>	mg/L	0.20	0.10	1		03/14/17 17:03	16984-48-8	
Sulfate	<b>16.8</b>	mg/L	1.0	0.50	1		03/14/17 17:03	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-6D**      **Lab ID: 60239429006**      Collected: 03/08/17 14:48      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>115</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:39	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:39	7440-41-7	
Boron	<b>935</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:39	7440-42-8	
Calcium	<b>79000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:39	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:39	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:39	7439-92-1	
Lithium	<b>11.8</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:39	7439-93-2	
Molybdenum	<b>108</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:39	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 15:06	7440-36-0	
Arsenic	<b>0.38J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:06	7440-38-2	B
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:06	7440-43-9	
Chromium	<b>0.82J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:06	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 15:06	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:06	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	03/15/17 09:30	03/15/17 13:20	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>346</b>	mg/L	5.0	5.0	1		03/13/17 13:35		
<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 12:32		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.5</b>	mg/L	2.0	1.0	2		03/14/17 17:43	16887-00-6	
Fluoride	<b>0.36</b>	mg/L	0.20	0.10	1		03/14/17 17:30	16984-48-8	
Sulfate	<b>74.9</b>	mg/L	5.0	2.5	5		03/14/17 17:57	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-BMW-1D**      **Lab ID: 60239429007**      Collected: 03/08/17 10:37      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>376</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:41	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:41	7440-41-7	
Boron	<b>185</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:41	7440-42-8	
Calcium	<b>146000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:41	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:41	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:41	7439-92-1	
Lithium	<b>13.7</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:41	7439-93-2	
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:41	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 15:18	7440-36-0	
Arsenic	<b>0.22J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:18	7440-38-2	B
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:18	7440-43-9	
Chromium	<b>1.2</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:18	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 15:18	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:18	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 13:22	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		03/13/17 13:35		
<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 11:56		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.0</b>	mg/L	1.0	0.50	1		03/14/17 18:10	16887-00-6	
Fluoride	<b>0.25</b>	mg/L	0.20	0.10	1		03/14/17 18:10	16984-48-8	
Sulfate	<b>34.4</b>	mg/L	5.0	2.5	5		03/14/17 18:51	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-BMW-3D**      **Lab ID: 60239429008**      Collected: 03/08/17 12:02      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>699</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:48	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:48	7440-41-7	
Boron	<b>69.4J</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:48	7440-42-8	
Calcium	<b>120000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:48	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:48	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:48	7439-92-1	
Lithium	<b>21.5</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:48	7439-93-2	
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:48	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 15:21	7440-36-0	
Arsenic	<b>0.086J</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:21	7440-38-2	B
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:21	7440-43-9	
Chromium	<b>0.70J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:21	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 15:21	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:21	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	03/15/17 09:30	03/15/17 13:25	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>424</b>	mg/L	5.0	5.0	1		03/13/17 13:36		
<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 12:08		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		03/14/17 19:04	16887-00-6	
Fluoride	<b>0.26</b>	mg/L	0.20	0.10	1		03/14/17 19:04	16984-48-8	
Sulfate	<b>21.9</b>	mg/L	2.0	1.0	2		03/14/17 19:17	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-DUP-1**      **Lab ID: 60239429009**      Collected: 03/09/17 08:00      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>127</b>	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:50	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:50	7440-41-7	
Boron	<b>24400</b>	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:50	7440-42-8	
Calcium	<b>300000</b>	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:50	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:50	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:50	7439-92-1	
Lithium	<b>29.4</b>	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:50	7439-93-2	
Molybdenum	<b>1830</b>	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:50	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.037J</b>	ug/L	1.0	0.026	1	03/14/17 13:00	03/22/17 15:24	7440-36-0	
Arsenic	<b>2.0</b>	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:24	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:24	7440-43-9	
Chromium	<b>0.46J</b>	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:24	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 15:24	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:24	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 13:27	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1380</b>	mg/L	5.0	5.0	1		03/13/17 15:25		
<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		03/13/17 14:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>18.7</b>	mg/L	1.0	0.50	1		03/14/17 19:31	16887-00-6	
Fluoride	<b>0.68</b>	mg/L	0.20	0.10	1		03/14/17 19:31	16984-48-8	
Sulfate	<b>754</b>	mg/L	100	50.0	100		03/14/17 19:44	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-FB-1**      **Lab ID: 60239429010**      Collected: 03/08/17 14:00      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	<0.91	ug/L	5.0	0.91	1	03/14/17 13:00	03/22/17 17:53	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	03/14/17 13:00	03/22/17 17:53	7440-41-7	
Boron	47.6J	ug/L	100	3.5	1	03/14/17 13:00	03/22/17 17:53	7440-42-8	
Calcium	64.3J	ug/L	100	36.0	1	03/14/17 13:00	03/22/17 17:53	7440-70-2	
Cobalt	<0.73	ug/L	5.0	0.73	1	03/14/17 13:00	03/22/17 17:53	7440-48-4	
Lead	<2.4	ug/L	5.0	2.4	1	03/14/17 13:00	03/22/17 17:53	7439-92-1	
Lithium	<2.9	ug/L	10.0	2.9	1	03/14/17 13:00	03/22/17 17:53	7439-93-2	
Molybdenum	<1.3	ug/L	20.0	1.3	1	03/14/17 13:00	03/22/17 17:53	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 15:15	7440-36-0	
Arsenic	<0.052	ug/L	1.0	0.052	1	03/14/17 13:00	03/22/17 15:15	7440-38-2	
Cadmium	<0.018	ug/L	0.50	0.018	1	03/14/17 13:00	03/22/17 15:15	7440-43-9	
Chromium	0.48J	ug/L	1.0	0.054	1	03/14/17 13:00	03/22/17 15:15	7440-47-3	B
Selenium	<0.086	ug/L	1.0	0.086	1	03/14/17 13:00	03/22/17 15:15	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	03/14/17 13:00	03/22/17 15:15	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	03/15/17 09:30	03/15/17 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		03/13/17 13:36		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	7.9	Std. Units	0.10	0.10	1		03/13/17 12:27		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		03/14/17 19:58	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		03/14/17 19:58	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		03/14/17 19:58	14808-79-8	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

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QC Batch: 468825 Analysis Method: EPA 7470  
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
 Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

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METHOD BLANK: 1918996 Matrix: Water  
 Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	03/15/17 12:41	

LABORATORY CONTROL SAMPLE: 1918997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1918998 1918999

Parameter	Units	60239429001 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	92	93	75-125	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1919000 1919001

Parameter	Units	60239431001 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	90	94	75-125	4	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 CTR-BOTT  
Pace Project No.: 60239429

QC Batch: 468651 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

METHOD BLANK: 1918411 Matrix: Water  
Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

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	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60239429001 Result	Spike Conc.	Spike Conc.	MS Result						
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 CTR-BOTT

Pace Project No.: 60239429

Parameter	Units	1918415		1918416		MS % Rec	MSD % Rec	% Rec Limits	RPD	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 CTR-BOTT  
Pace Project No.: 60239429

QC Batch: 468653 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

METHOD BLANK: 1918422 Matrix: Water  
Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.041J	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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max		Qual
										RPD	RPD	
Antimony	ug/L	0.37J	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	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Parameter	Units	60239431001		1918426		1918427		% Rec	% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS Result	MSD Result								
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				
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 CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468478

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60239429005, 60239429006, 60239429007, 60239429008, 60239429010

METHOD BLANK: 1917978

Matrix: Water

Associated Lab Samples: 60239429005, 60239429006, 60239429007, 60239429008, 60239429010

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 CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468517

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60239429002, 60239429003, 60239429004, 60239429009

METHOD BLANK: 1918045

Matrix: Water

Associated Lab Samples: 60239429002, 60239429003, 60239429004, 60239429009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/13/17 15:14	

LABORATORY CONTROL SAMPLE: 1918046

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

SAMPLE DUPLICATE: 1918047

Parameter	Units	60239509001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1920	1890	1	10	

SAMPLE DUPLICATE: 1918048

Parameter	Units	60239446005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	251	282	12	10 D6	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468641	Analysis Method: SM 2540C
QC Batch Method: SM 2540C	Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60239429001	

METHOD BLANK: 1918378 Matrix: Water  
Associated Lab Samples: 60239429001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	03/14/17 11:13	

LABORATORY CONTROL SAMPLE: 1918379

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	965	96	80-120	

SAMPLE DUPLICATE: 1918380

Parameter	Units	60239429001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	314	312	1	10	

SAMPLE DUPLICATE: 1918381

Parameter	Units	60239431001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	330	340	3	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468451 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60239429005, 60239429006, 60239429007, 60239429008, 60239429010

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 CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468452 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60239429009

SAMPLE DUPLICATE: 1917910

Parameter	Units	60239346001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	7.0	6.8	3	5	H6

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

QC Batch: 468453 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004

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 CTR-BOTT

Pace Project No.: 60239429

QC Batch:	468377	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010		

METHOD BLANK: 1917755 Matrix: Water  
Associated Lab Samples: 60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	03/14/17 09:30	
Fluoride	mg/L	<0.10	0.20	0.10	03/14/17 09:30	
Sulfate	mg/L	<0.50	1.0	0.50	03/14/17 09:30	

LABORATORY CONTROL SAMPLE: 1917756

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	103	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	5.4	107	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1917757 1917758

Parameter	Units	60239429001		60239429002		60239429003		60239429004		% 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	18.8	10	10	30.4	29.0	117	103	80-120	5	15		
Fluoride	mg/L	0.34	2.5	2.5	2.9	2.9	103	104	80-120	1	15		
Sulfate	mg/L	51.0	25	25	79.7	83.5	115	130	80-120	5	15	M1	

MATRIX SPIKE SAMPLE: 1917759

Parameter	Units	60239429002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	18.9	500	536	103	80-120	
Fluoride	mg/L	0.72	2.5	3.5	110	80-120	
Sulfate	mg/L	738	500	1340	120	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-1D**      **Lab ID: 60239429001**      Collected: 03/09/17 13:43      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>0.525 ± 0.369 (0.178)</b> <b>C:NA T:87%</b>	pCi/L	03/30/17 12:26	13982-63-3	
Radium-228	EPA 904.0	<b>0.270 ± 0.391 (0.842)</b> <b>C:63% T:91%</b>	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-2D**      **Lab ID: 60239429002**      Collected: 03/09/17 11:04      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>-0.063 ± 0.285 (0.673)</b> C:NA T:93%	pCi/L	03/30/17 12:26	13982-63-3	
Radium-228	EPA 904.0	<b>1.13 ± 0.551 (0.946)</b> C:64% T:82%	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0662 ± 0.389 (0.795)</b> C:NA T:90%	pCi/L	03/30/17 12:26	13982-63-3	
Radium-228	EPA 904.0	<b>0.785 ± 0.486 (0.914)</b> C:68% T:77%	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-4D**      **Lab ID: 60239429004**      Collected: 03/09/17 08:48      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>-0.064 ± 0.290 (0.684)</b> C:NA T:92%	pCi/L	03/30/17 12:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.231 ± 0.377 (0.819)</b> C:65% T:91%	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.197 ± 0.387 (0.708)</b> C:NA T:92%	pCi/L	03/30/17 12:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.544 ± 0.398 (0.778)</b> C:71% T:87%	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.122 ± 0.293 (0.566)</b> C:NA T:94%	pCi/L	03/30/17 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.683 ± 0.408 (0.753)</b> C:70% T:88%	pCi/L	03/31/17 14:33	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-BMW-1D**      **Lab ID: 60239429007**      Collected: 03/08/17 10:37      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>0.122 ± 0.413 (0.798)</b> C:NA T:93%	pCi/L	03/30/17 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.537 ± 0.422 (0.838)</b> C:70% T:82%	pCi/L	03/31/17 14:34	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-BMW-3D</b> <b>Lab ID: 60239429008</b> Collected: 03/08/17 12:02      Received: 03/10/17 03:45      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>0.382 ± 0.501 (0.834)</b> C:NA T:89%	pCi/L	03/30/17 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.300 ± 0.374 (0.791)</b> C:64% T:89%	pCi/L	03/31/17 14:34	15262-20-1	

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

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**Sample: S-UMW-DUP-1**      **Lab ID: 60239429009**      Collected: 03/09/17 08:00      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>0.000 ± 0.407 (0.860)</b> <b>C:NA T:91%</b>	pCi/L	03/30/17 12:45	13982-63-3	
Radium-228	EPA 904.0	<b>0.597 ± 0.404 (0.768)</b> <b>C:68% T:85%</b>	pCi/L	03/31/17 14:34	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-FB-1**      **Lab ID: 60239429010**      Collected: 03/08/17 14:00      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>0.398 ± 0.322 (0.180)</b> <b>C:NA T:88%</b>	pCi/L	03/30/17 12:53	13982-63-3	
Radium-228	EPA 904.0	<b>0.253 ± 0.366 (0.787)</b> <b>C:71% T:87%</b>	pCi/L	03/31/17 14:34	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-1D MS**      **Lab ID: 60239429011**      Collected: 03/09/17 13:43      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>91.37%REC ± NA (NA)</b>	pCi/L	03/30/17 12:53	13982-63-3	
Radium-228	EPA 904.0	<b>104.05 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	03/31/17 14:34	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

**Sample: S-UMW-1D MSD**      **Lab ID: 60239429012**      Collected: 03/09/17 13:43      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>85.03%REC 7.20RPD ± NA (NA)</b>	pCi/L	03/30/17 13:00	13982-63-3	
Radium-228	EPA 904.0	<b>100.61 %REC 3.36 RPD ± NA (NA) C:NA T:NA</b>	pCi/L	03/31/17 14:34	15262-20-1	

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

---

QC Batch:	252849	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010, 60239429011, 60239429012		

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METHOD BLANK:	1243931	Matrix:	Water
Associated Lab Samples:	60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010, 60239429011, 60239429012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.201 ± 0.306 (0.181) C:NA T:88%	pCi/L	03/30/17 12:26	

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 CTR-BOTT

Pace Project No.: 60239429

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QC Batch:	252851	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010, 60239429011, 60239429012		

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METHOD BLANK:	1243933	Matrix:	Water
Associated Lab Samples:	60239429001, 60239429002, 60239429003, 60239429004, 60239429005, 60239429006, 60239429007, 60239429008, 60239429009, 60239429010, 60239429011, 60239429012		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.0383 ± 0.325 (0.747) C:68% T:93%	pCi/L	03/31/17 14:33	

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 CTR-BOTT

Pace Project No.: 60239429

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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

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.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60239429001	S-UMW-1D	EPA 200.7	468651	EPA 200.7	468726
60239429002	S-UMW-2D	EPA 200.7	468651	EPA 200.7	468726
60239429003	S-UMW-3D	EPA 200.7	468651	EPA 200.7	468726
60239429004	S-UMW-4D	EPA 200.7	468651	EPA 200.7	468726
60239429005	S-UMW-5D	EPA 200.7	468651	EPA 200.7	468726
60239429006	S-UMW-6D	EPA 200.7	468651	EPA 200.7	468726
60239429007	S-BMW-1D	EPA 200.7	468651	EPA 200.7	468726
60239429008	S-BMW-3D	EPA 200.7	468651	EPA 200.7	468726
60239429009	S-UMW-DUP-1	EPA 200.7	468651	EPA 200.7	468726
60239429010	S-UMW-FB-1	EPA 200.7	468651	EPA 200.7	468726
60239429001	S-UMW-1D	EPA 200.8	468653	EPA 200.8	468727
60239429002	S-UMW-2D	EPA 200.8	468653	EPA 200.8	468727
60239429003	S-UMW-3D	EPA 200.8	468653	EPA 200.8	468727
60239429004	S-UMW-4D	EPA 200.8	468653	EPA 200.8	468727
60239429005	S-UMW-5D	EPA 200.8	468653	EPA 200.8	468727
60239429006	S-UMW-6D	EPA 200.8	468653	EPA 200.8	468727
60239429007	S-BMW-1D	EPA 200.8	468653	EPA 200.8	468727
60239429008	S-BMW-3D	EPA 200.8	468653	EPA 200.8	468727
60239429009	S-UMW-DUP-1	EPA 200.8	468653	EPA 200.8	468727
60239429010	S-UMW-FB-1	EPA 200.8	468653	EPA 200.8	468727
60239429001	S-UMW-1D	EPA 7470	468825	EPA 7470	468843
60239429002	S-UMW-2D	EPA 7470	468825	EPA 7470	468843
60239429003	S-UMW-3D	EPA 7470	468825	EPA 7470	468843
60239429004	S-UMW-4D	EPA 7470	468825	EPA 7470	468843
60239429005	S-UMW-5D	EPA 7470	468825	EPA 7470	468843
60239429006	S-UMW-6D	EPA 7470	468825	EPA 7470	468843
60239429007	S-BMW-1D	EPA 7470	468825	EPA 7470	468843
60239429008	S-BMW-3D	EPA 7470	468825	EPA 7470	468843
60239429009	S-UMW-DUP-1	EPA 7470	468825	EPA 7470	468843
60239429010	S-UMW-FB-1	EPA 7470	468825	EPA 7470	468843
60239429001	S-UMW-1D	EPA 903.1	252849		
60239429002	S-UMW-2D	EPA 903.1	252849		
60239429003	S-UMW-3D	EPA 903.1	252849		
60239429004	S-UMW-4D	EPA 903.1	252849		
60239429005	S-UMW-5D	EPA 903.1	252849		
60239429006	S-UMW-6D	EPA 903.1	252849		
60239429007	S-BMW-1D	EPA 903.1	252849		
60239429008	S-BMW-3D	EPA 903.1	252849		
60239429009	S-UMW-DUP-1	EPA 903.1	252849		
60239429010	S-UMW-FB-1	EPA 903.1	252849		
60239429011	S-UMW-1D MS	EPA 903.1	252849		
60239429012	S-UMW-1D MSD	EPA 903.1	252849		
60239429001	S-UMW-1D	EPA 904.0	252851		
60239429002	S-UMW-2D	EPA 904.0	252851		
60239429003	S-UMW-3D	EPA 904.0	252851		
60239429004	S-UMW-4D	EPA 904.0	252851		
60239429005	S-UMW-5D	EPA 904.0	252851		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60239429

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60239429006	S-UMW-6D	EPA 904.0	252851		
60239429007	S-BMW-1D	EPA 904.0	252851		
60239429008	S-BMW-3D	EPA 904.0	252851		
60239429009	S-UMW-DUP-1	EPA 904.0	252851		
60239429010	S-UMW-FB-1	EPA 904.0	252851		
60239429011	S-UMW-1D MS	EPA 904.0	252851		
60239429012	S-UMW-1D MSD	EPA 904.0	252851		
60239429001	S-UMW-1D	SM 2540C	468641		
60239429002	S-UMW-2D	SM 2540C	468517		
60239429003	S-UMW-3D	SM 2540C	468517		
60239429004	S-UMW-4D	SM 2540C	468517		
60239429005	S-UMW-5D	SM 2540C	468478		
60239429006	S-UMW-6D	SM 2540C	468478		
60239429007	S-BMW-1D	SM 2540C	468478		
60239429008	S-BMW-3D	SM 2540C	468478		
60239429009	S-UMW-DUP-1	SM 2540C	468517		
60239429010	S-UMW-FB-1	SM 2540C	468478		
60239429001	S-UMW-1D	SM 4500-H+B	468453		
60239429002	S-UMW-2D	SM 4500-H+B	468453		
60239429003	S-UMW-3D	SM 4500-H+B	468453		
60239429004	S-UMW-4D	SM 4500-H+B	468453		
60239429005	S-UMW-5D	SM 4500-H+B	468451		
60239429006	S-UMW-6D	SM 4500-H+B	468451		
60239429007	S-BMW-1D	SM 4500-H+B	468451		
60239429008	S-BMW-3D	SM 4500-H+B	468451		
60239429009	S-UMW-DUP-1	SM 4500-H+B	468452		
60239429010	S-UMW-FB-1	SM 4500-H+B	468451		
60239429001	S-UMW-1D	EPA 300.0	468377		
60239429002	S-UMW-2D	EPA 300.0	468377		
60239429003	S-UMW-3D	EPA 300.0	468377		
60239429004	S-UMW-4D	EPA 300.0	468377		
60239429005	S-UMW-5D	EPA 300.0	468377		
60239429006	S-UMW-6D	EPA 300.0	468377		
60239429007	S-BMW-1D	EPA 300.0	468377		
60239429008	S-BMW-3D	EPA 300.0	468377		
60239429009	S-UMW-DUP-1	EPA 300.0	468377		
60239429010	S-UMW-FB-1	EPA 300.0	468377		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60239429



60239429

Client Name: Bolder

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 -0.5/13.0/12.4 Corr. Factor CF +1.5 CF +0.9 Corrected 1.0/15.2/13.9

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 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 Clark \_\_\_\_\_ 3/10/17 \_\_\_\_\_

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





# CHAIN-OF-CUSTODY / Analytical Request Document

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

**Section A** Required Client Information: **Section B** Required Project Information: **Section C** Invoice Information:

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

Page: 1 of 1

ITEM #	Section D Required Client Information	Valid Matrix Codes MATERIAL DRINKING WATER DW WATER WW WASTE WATER PRODUCT P SOLID OIL SL WP AR OT TS	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives							Analysis Test				Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.	
					COMPOSITE START	COMPOSITE END/GRAB			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
1	S-UMMW-1D			G		3/11/12	17.03	12	3	9												38032-20 38124 68012 001
2	S-UMMW-2D			G																		1832-20 1833N 28012 002
3	S-UMMW-3D			G																		
4	S-UMMW-4D			G																		
5	S-UMMW-5D			G																		
6	S-UMMW-6D			G																		
7	S-BMW-1D			G																		
8	S-BMW-3D			G																		
9	S-UMMW-DUP-1			G																		
10	S-UMMW-FB-1			G																		
11				G																		
12				G																		

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS							
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)				
EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo + EPA 7470A:Hg EPA 200.8: Sb, As, Cd, Cr, Se, Tl	<i>[Signature]</i>	3/9/12	15:30	<i>[Signature]</i>	3/9/12	15:30	Y	Y	Y	Y	15.3	Y	Y	Y
	<i>[Signature]</i>	3/9/12	17:00	<i>[Signature]</i>	3/9/12	17:00	Y	Y	Y	Y	13.9	Y	Y	Y

<b>SAMPLER NAME AND SIGNATURE</b>		<b>DATE Signed (MM/DD/YY):</b> 3/19/12
<b>PRINT Name of SAMPLER:</b>	<i>[Signature]</i>	
<b>SIGNATURE of SAMPLER:</b>	<i>[Signature]</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.

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

April 26, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60241393

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-BOTT

Pace Project No.: 60241393

---

### 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-BOTT

Pace Project No.: 60241393

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60241393001	S-BMW-3D	Water	04/05/17 11:37	04/06/17 03:50

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60241393001	S-BMW-3D	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

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

**Sample: S-BMW-3D**      **Lab ID: 60241393001**      Collected: 04/05/17 11:37      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>684</b>	ug/L	5.0	0.91	1	04/10/17 12:00	04/13/17 13:11	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	04/10/17 12:00	04/13/17 13:11	7440-41-7	
Boron	<b>58.2J</b>	ug/L	100	3.5	1	04/10/17 12:00	04/13/17 13:11	7440-42-8	
Calcium	<b>105000</b>	ug/L	100	36.0	1	04/10/17 12:00	04/13/17 13:11	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	04/10/17 12:00	04/13/17 13:11	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	04/10/17 12:00	04/13/17 13:11	7439-92-1	
Lithium	<b>23.6</b>	ug/L	10.0	2.9	1	04/10/17 12:00	04/13/17 13:11	7439-93-2	
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	04/10/17 12:00	04/13/17 13:11	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.041J</b>	ug/L	1.0	0.026	1	04/07/17 10:40	04/10/17 12:37	7440-36-0	
Arsenic	<b>&lt;0.052</b>	ug/L	1.0	0.052	1	04/07/17 10:40	04/10/17 12:37	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	04/07/17 10:40	04/10/17 12:37	7440-43-9	
Chromium	<b>&lt;0.054</b>	ug/L	1.0	0.054	1	04/07/17 10:40	04/10/17 12:37	7440-47-3	
Selenium	<b>0.10J</b>	ug/L	1.0	0.086	1	04/07/17 10:40	04/11/17 13:15	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	04/07/17 10:40	04/10/17 12:37	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 10:23	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>414</b>	mg/L	5.0	5.0	1		04/06/17 15:38		
<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		04/12/17 11:42		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		04/07/17 02:14	16887-00-6	
Fluoride	<b>0.31</b>	mg/L	0.20	0.10	1		04/07/17 02:14	16984-48-8	
Sulfate	<b>24.6</b>	mg/L	2.0	1.0	2		04/07/17 02:29	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

QC Batch: 471728

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60241393001

METHOD BLANK: 1931494

Matrix: Water

Associated Lab Samples: 60241393001

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		1931496		1931497		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.					
Mercury	ug/L	<0.046	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-BOTT

Pace Project No.: 60241393

QC Batch: 472060 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60241393001

METHOD BLANK: 1933194 Matrix: Water

Associated Lab Samples: 60241393001

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.	Spike Conc.	MS Result	MSD Result	% Rec	% 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-BOTT

Pace Project No.: 60241393

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-BOTT

Pace Project No.: 60241393

QC Batch: 471820 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60241393001

METHOD BLANK: 1931891 Matrix: Water

Associated Lab Samples: 60241393001

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-BOTT

Pace Project No.: 60241393

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931895												1931896	
Parameter	Units	7563209002 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
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 Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
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 Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
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-BOTT

Pace Project No.: 60241393

QC Batch: 471744

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60241393001

METHOD BLANK: 1931522

Matrix: Water

Associated Lab Samples: 60241393001

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-BOTT

Pace Project No.: 60241393

QC Batch: 472308 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60241393001

SAMPLE DUPLICATE: 1934027

Parameter	Units	60241275001 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-BOTT

Pace Project No.: 60241393

QC Batch: 471714 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60241393001

METHOD BLANK: 1931453 Matrix: Water  
 Associated Lab Samples: 60241393001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	04/06/17 23:32	
Fluoride	mg/L	<0.10	0.20	0.10	04/06/17 23:32	
Sulfate	mg/L	<0.50	1.0	0.50	04/06/17 23:32	

LABORATORY CONTROL SAMPLE: 1931454

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	103	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1931455 1931456

Parameter	Units	60241402002		1931455		1931456		% Rec Limits	RPD	Max RPD	Qual
		MS Result	MS Spike Conc.	MS Result	MS Spike Conc.	MS Result	MS Spike Conc.				
Chloride	mg/L	672		931		916		80-120	2	15	
Fluoride	mg/L	ND	125	132	125	128	106	80-120	4	15	
Sulfate	mg/L	339	250	591	250	588	101	80-120	0	15	

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**REPORT OF LABORATORY ANALYSIS**

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## ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
<b>Sample: S-BMW-3D</b> <b>Lab ID: 60241393001</b> Collected: 04/05/17 11:37      Received: 04/06/17 03:50      Matrix: Water PWS:      Site ID:      Sample Type:						
Radium-226	EPA 903.1	<b>1.04 ± 0.647 (0.638)</b> <b>C:NA T:87%</b>	pCi/L	04/24/17 22:21	13982-63-3	
Radium-228	EPA 904.0	<b>0.721 ± 0.393 (0.710)</b> <b>C:81% T:83%</b>	pCi/L	04/24/17 16:38	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

QC Batch: 255654 Analysis Method: EPA 903.1

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

Associated Lab Samples: 60241393001

METHOD BLANK: 1259160 Matrix: Water

Associated Lab Samples: 60241393001

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	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

QC Batch: 255790

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60241393001

METHOD BLANK: 1259874

Matrix: Water

Associated Lab Samples: 60241393001

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	

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### REPORT OF LABORATORY ANALYSIS

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

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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.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60241393

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60241393001	S-BMW-3D	EPA 200.7	472060	EPA 200.7	472122
60241393001	S-BMW-3D	EPA 200.8	471820	EPA 200.8	471945
60241393001	S-BMW-3D	EPA 7470	471728	EPA 7470	471775
60241393001	S-BMW-3D	EPA 903.1	255654		
60241393001	S-BMW-3D	EPA 904.0	255790		
60241393001	S-BMW-3D	SM 2540C	471744		
60241393001	S-BMW-3D	SM 4500-H+B	472308		
60241393001	S-BMW-3D	EPA 300.0	471714		

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Sample Condition Upon Receipt

WO#: 60241393
Barcode: 60241393

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 0.9 / 1.9 Corr. Factor CF +1.5 CF +0.9 Corrected 2.4 / 13.4

Date and initials of person examining contents: 4/6/17

Table with 3 columns: Question, Yes/No/N/A checkboxes, and handwritten notes (e.g., PH, NT, 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 Chok Date: 4/6/17



# 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: **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 - Bottom Ash**  
 Project Number: **153-1406.0003A**

**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 #	Valid Matrix Codes		Valid Matrix Codes	COLLECTED		SAMPLER 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.						
	DRINKING WATER	WASTE WATER		COMPOSITE START	COMPOSITE END/GRAB			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	Y/N ↑	Y/N	Y/N	Y/N	Y/N
	WATER	PRODUCT		DATE	TIME			DATE	TIME	DATE	TIME	DATE	TIME					DATE	TIME	DATE	TIME	DATE	TIME
1			WT				WT G	5	2	3						25924	60241893						
2			WT				WT G										1825120-25924-25924						
3			WT				WT G										25924						
4			WT				WT G										25924						
5			WT				WT G										25924						
6			WT				WT G										25924						
7			WT				WT G										25924						
8			WT				WT G										25924						
9			WT				WT G										25924						
10			WT				WT G										25924						
11			WT				WT G										25924						
12			WT				WT G										25924						

ADDITIONAL COMMENTS		RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION		DATE	TIME	SAMPLE CONDITIONS		Temp In °C	Received on	Custody Sealed	Cooler (Y/N)	Samples Intact
EPA 200.7: Br, Bb, B, Ca, Co, Pb, Li, Mo + EPA 7470A Hg EPA 200.8: Sb, As, Cd, Cr, Se, Tl		Johannes Golder	4/5/17	1337	Richard Mann	4/5/17	1337			Y	Y			Y	Y
		Richard Mann	4/5/17	1700	John Bass	4/5/17	0330			N	N	18.4		Y	Y

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER: **John Bass**  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YY): **4/5/17**

June 27, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60246023

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between June 07, 2017 and June 08, 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-BOTT

Pace Project No.: 60246023

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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-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60246023001	S-UMW-1D	Water	06/07/17 12:30	06/08/17 04:10
60246023002	S-UMW-2D	Water	06/07/17 10:35	06/08/17 04:10
60246023003	S-UMW-3D	Water	06/07/17 09:40	06/08/17 04:10
60246023004	S-UMW-4D	Water	06/07/17 08:34	06/08/17 04:10
60246023005	S-UMW-5D	Water	06/07/17 08:45	06/08/17 04:10
60246023006	S-UMW-DUP-1	Water	06/07/17 08:00	06/08/17 04:10
60246023007	S-UMW-FB-1	Water	06/07/17 08:32	06/08/17 04:10
60245851001	S-BMW-1D	Water	06/06/17 15:00	06/07/17 04:25
60245851002	S-BMW-3D	Water	06/05/17 13:26	06/07/17 04:25
60245851003	S-UMW-6D	Water	06/06/17 15:00	06/07/17 04:25
60245851004	S-UMW-6D MS	Water	06/06/17 15:00	06/07/17 04:25
60245851005	S-UMW-6D MSD	Water	06/06/17 15:00	06/07/17 04:25

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60246023001	S-UMW-1D	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
60246023002	S-UMW-2D	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
60246023003	S-UMW-3D	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
60246023004	S-UMW-4D	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
60246023005	S-UMW-5D	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
		EPA 200.7	TDS	8	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JRS	1	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60246023006	S-UMW-DUP-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
60246023007	S-UMW-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
60245851001	S-BMW-1D	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
60245851002	S-BMW-3D	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
60245851003	S-UMW-6D	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

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		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
60245851004	S-UMW-6D MS	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60245851005	S-UMW-6D MSD	EPA 903.1	WRR	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

### REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-1D**      **Lab ID: 60246023001**      Collected: 06/07/17 12:30      Received: 06/08/17 04:10      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>109</b>	ug/L	5.0	0.91	1	06/16/17 10:25	06/16/17 17:30	7440-39-3	
Beryllium	<b>0.24J</b>	ug/L	1.0	0.16	1	06/16/17 10:25	06/16/17 17:30	7440-41-7	B
Boron	<b>278</b>	ug/L	100	3.5	1	06/16/17 10:25	06/16/17 17:30	7440-42-8	
Calcium	<b>53500</b>	ug/L	100	36.0	1	06/16/17 10:25	06/16/17 17:30	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 10:25	06/16/17 17:30	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 10:25	06/16/17 17:30	7439-92-1	
Lithium	<b>10.7</b>	ug/L	10.0	2.9	1	06/16/17 10:25	06/16/17 17:30	7439-93-2	
Molybdenum	<b>36.4</b>	ug/L	20.0	1.3	1	06/16/17 10:25	06/16/17 17:30	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/16/17 10:25	06/20/17 14:02	7440-36-0	
Arsenic	<b>0.98J</b>	ug/L	1.0	0.052	1	06/16/17 10:25	06/20/17 14:02	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/16/17 10:25	06/20/17 14:02	7440-43-9	
Chromium	<b>0.22J</b>	ug/L	1.0	0.054	1	06/16/17 10:25	06/20/17 14:02	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/16/17 10:25	06/20/17 14:02	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/16/17 10:25	06/20/17 14:02	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	06/19/17 10:08	06/19/17 15:30	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>268</b>	mg/L	5.0	5.0	1		06/13/17 09:33		
<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		06/12/17 12:46		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>17.0</b>	mg/L	1.0	0.50	1		06/12/17 19:51	16887-00-6	
Fluoride	<b>0.34</b>	mg/L	0.20	0.10	1		06/12/17 19:51	16984-48-8	
Sulfate	<b>36.6</b>	mg/L	2.0	1.0	2		06/12/17 20:07	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-2D**      **Lab ID: 60246023002**      Collected: 06/07/17 10:35      Received: 06/08/17 04:10      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>96.8</b>	ug/L	5.0	0.91	1	06/16/17 16:55	06/20/17 18:18	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:18	7440-41-7	
Boron	<b>24200</b>	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:18	7440-42-8	
Calcium	<b>244000</b>	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:18	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:18	7440-48-4	
Lead	<b>3.0J</b>	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:18	7439-92-1	
Lithium	<b>18.6</b>	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:18	7439-93-2	
Molybdenum	<b>2170</b>	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:18	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<b>0.044J</b>	ug/L	1.0	0.026	1	06/16/17 16:55	06/20/17 14:28	7440-36-0	
Arsenic	<b>1.9</b>	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:28	7440-38-2	
Cadmium	<b>0.24J</b>	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:28	7440-43-9	
Chromium	<b>0.12J</b>	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:28	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:28	7782-49-2	
Thallium	<b>0.10J</b>	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:28	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	06/19/17 10:08	06/19/17 15:32	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1220</b>	mg/L	5.0	5.0	1		06/13/17 09:33		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>7.9</b>	Std. Units	0.10	0.10	1		06/12/17 12:33		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.1</b>	mg/L	2.0	1.0	2		06/13/17 10:54	16887-00-6	
Fluoride	<b>0.78</b>	mg/L	0.20	0.10	1		06/12/17 20:38	16984-48-8	
Sulfate	<b>784</b>	mg/L	100	50.0	100		06/12/17 20:53	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-3D**      **Lab ID: 60246023003**      Collected: 06/07/17 09:40      Received: 06/08/17 04:10      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>70.5</b>	ug/L	5.0	0.91	1	06/16/17 16:55	06/20/17 18:23	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:23	7440-41-7	
Boron	<b>24200</b>	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:23	7440-42-8	
Calcium	<b>231000</b>	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:23	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:23	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:23	7439-92-1	
Lithium	<b>16.7</b>	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:23	7439-93-2	
Molybdenum	<b>3920</b>	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:23	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.030J</b>	ug/L	1.0	0.026	1	06/16/17 16:55	06/20/17 14:31	7440-36-0	
Arsenic	<b>0.23J</b>	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:31	7440-38-2	
Cadmium	<b>0.53</b>	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:31	7440-43-9	
Chromium	<b>0.67J</b>	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:31	7440-47-3	
Selenium	<b>0.17J</b>	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:31	7782-49-2	
Thallium	<b>0.052J</b>	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:31	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	06/19/17 10:08	06/19/17 15:35	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1130</b>	mg/L	5.0	5.0	1		06/13/17 09:33		
<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		06/12/17 12:28		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>21.5</b>	mg/L	2.0	1.0	2		06/12/17 21:24	16887-00-6	
Fluoride	<b>0.94</b>	mg/L	0.20	0.10	1		06/12/17 21:09	16984-48-8	
Sulfate	<b>664</b>	mg/L	50.0	25.0	50		06/12/17 21:39	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-4D**      **Lab ID: 60246023004**      Collected: 06/07/17 08:34      Received: 06/08/17 04:10      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>67.5</b>	ug/L	5.0	0.91	1	06/16/17 16:55	06/20/17 18:25	7440-39-3	
Beryllium	<b>0.20J</b>	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:25	7440-41-7	B
Boron	<b>21600</b>	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:25	7440-42-8	
Calcium	<b>174000</b>	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:25	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:25	7440-48-4	
Lead	<b>3.4J</b>	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:25	7439-92-1	
Lithium	<b>31.9</b>	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:25	7439-93-2	
Molybdenum	<b>6120</b>	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:25	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.043J</b>	ug/L	1.0	0.026	1	06/16/17 16:55	06/20/17 14:37	7440-36-0	
Arsenic	<b>&lt;0.052</b>	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:37	7440-38-2	
Cadmium	<b>0.91</b>	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:37	7440-43-9	
Chromium	<b>0.13J</b>	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:37	7440-47-3	
Selenium	<b>0.12J</b>	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:37	7782-49-2	
Thallium	<b>0.083J</b>	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:37	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	06/19/17 10:08	06/19/17 15:37	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>947</b>	mg/L	5.0	5.0	1		06/13/17 09:34		
<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		06/12/17 12:24		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>26.6</b>	mg/L	2.0	1.0	2		06/12/17 22:56	16887-00-6	
Fluoride	<b>0.70</b>	mg/L	0.20	0.10	1		06/12/17 22:41	16984-48-8	
Sulfate	<b>439</b>	mg/L	50.0	25.0	50		06/12/17 21:55	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-5D**      **Lab ID: 60246023005**      Collected: 06/07/17 08:45      Received: 06/08/17 04:10      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>284</b>	ug/L	5.0	0.91	1	06/16/17 16:55	06/20/17 18:27	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:27	7440-41-7	
Boron	<b>7240</b>	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:27	7440-42-8	
Calcium	<b>82900</b>	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:27	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:27	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:27	7439-92-1	
Lithium	<b>24.7</b>	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:27	7439-93-2	
Molybdenum	<b>270</b>	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:27	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/16/17 16:55	06/20/17 14:40	7440-36-0	
Arsenic	<b>0.41J</b>	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:40	7440-38-2	
Cadmium	<b>0.028J</b>	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:40	7440-43-9	
Chromium	<b>0.26J</b>	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:40	7440-47-3	
Selenium	<b>0.11J</b>	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:40	7782-49-2	
Thallium	<b>0.038J</b>	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:40	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	06/19/17 10:08	06/19/17 15:39	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>384</b>	mg/L	5.0	5.0	1		06/13/17 09:34		
<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		06/12/17 12:26		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>27.6</b>	mg/L	2.0	1.0	2		06/12/17 23:27	16887-00-6	
Fluoride	<b>0.53</b>	mg/L	0.20	0.10	1		06/12/17 23:12	16984-48-8	
Sulfate	<b>40.0</b>	mg/L	5.0	2.5	5		06/13/17 11:09	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-DUP-1**      **Lab ID: 60246023006**      Collected: 06/07/17 08:00      Received: 06/08/17 04:10      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>104</b>	ug/L	5.0	0.91	1	06/16/17 16:55	06/20/17 18:30	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:30	7440-41-7	
Boron	<b>357</b>	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:30	7440-42-8	
Calcium	<b>55700</b>	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:30	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:30	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:30	7439-92-1	
Lithium	<b>7.2J</b>	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:30	7439-93-2	
Molybdenum	<b>34.9</b>	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:30	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>0.034J</b>	ug/L	1.0	0.026	1	06/16/17 16:55	06/20/17 14:53	7440-36-0	
Arsenic	<b>0.93J</b>	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:53	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:53	7440-43-9	
Chromium	<b>0.069J</b>	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:53	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:53	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:53	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	06/19/17 10:08	06/19/17 15:41	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>282</b>	mg/L	5.0	5.0	1		06/13/17 09:34		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	<b>8.9</b>	Std. Units	0.10	0.10	1		06/09/17 12:43		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>17.0</b>	mg/L	1.0	0.50	1		06/12/17 23:43	16887-00-6	
Fluoride	<b>0.36</b>	mg/L	0.20	0.10	1		06/12/17 23:43	16984-48-8	
Sulfate	<b>37.1</b>	mg/L	2.0	1.0	2		06/12/17 23:58	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-FB-1**      **Lab ID: 60246023007**      Collected: 06/07/17 08:32      Received: 06/08/17 04:10      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	06/16/17 16:55	06/20/17 18:32	7440-39-3	
Beryllium	0.18J	ug/L	1.0	0.16	1	06/16/17 16:55	06/20/17 18:32	7440-41-7	B
Boron	44.4J	ug/L	100	3.5	1	06/16/17 16:55	06/20/17 18:32	7440-42-8	
Calcium	<36.0	ug/L	100	36.0	1	06/16/17 16:55	06/20/17 18:32	7440-70-2	
Cobalt	<0.73	ug/L	5.0	0.73	1	06/16/17 16:55	06/20/17 18:32	7440-48-4	
Lead	<2.4	ug/L	5.0	2.4	1	06/16/17 16:55	06/20/17 18:32	7439-92-1	
Lithium	<2.9	ug/L	10.0	2.9	1	06/16/17 16:55	06/20/17 18:32	7439-93-2	
Molybdenum	<1.3	ug/L	20.0	1.3	1	06/16/17 16:55	06/20/17 18:32	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	06/16/17 16:55	06/20/17 14:50	7440-36-0	
Arsenic	<0.052	ug/L	1.0	0.052	1	06/16/17 16:55	06/20/17 14:50	7440-38-2	
Cadmium	<0.018	ug/L	0.50	0.018	1	06/16/17 16:55	06/20/17 14:50	7440-43-9	
Chromium	0.11J	ug/L	1.0	0.054	1	06/16/17 16:55	06/20/17 14:50	7440-47-3	
Selenium	<0.086	ug/L	1.0	0.086	1	06/16/17 16:55	06/20/17 14:50	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	06/16/17 16:55	06/20/17 14:50	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	06/19/17 10:08	06/19/17 15:43	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		06/13/17 09:35		
<b>4500H+ pH, Electrometric</b>		Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	5.3	Std. Units	0.10	0.10	1		06/12/17 12:21		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		06/13/17 00:29	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		06/13/17 00:29	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		06/13/17 00:29	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-BMW-1D**      **Lab ID: 60245851001**      Collected: 06/06/17 15:00      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>332</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 17:12	7440-39-3	
Beryllium	<b>0.36J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 17:12	7440-41-7	B
Boron	<b>179</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 17:12	7440-42-8	
Calcium	<b>118000</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 17:12	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 17:12	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 17:12	7439-92-1	
Lithium	<b>13.0</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 17:12	7439-93-2	B
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 17:12	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 22:58	7440-36-0	
Arsenic	<b>0.16J</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 22:58	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 22:58	7440-43-9	
Chromium	<b>0.16J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 22:58	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 22:58	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 22:58	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 15:14	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>475</b>	mg/L	5.0	5.0	1		06/09/17 07:41		
<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 12:30		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.6</b>	mg/L	1.0	0.50	1		06/08/17 22:30	16887-00-6	
Fluoride	<b>0.24</b>	mg/L	0.20	0.10	1		06/08/17 22:30	16984-48-8	
Sulfate	<b>36.1</b>	mg/L	5.0	2.5	5		06/08/17 22:46	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-BMW-3D**      **Lab ID: 60245851002**      Collected: 06/05/17 13:26      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>665</b>	ug/L	5.0	0.91	1	06/14/17 17:00	06/19/17 17:19	7440-39-3	
Beryllium	<b>0.38J</b>	ug/L	1.0	0.16	1	06/14/17 17:00	06/19/17 17:19	7440-41-7	B
Boron	<b>42.4J</b>	ug/L	100	3.5	1	06/14/17 17:00	06/19/17 17:19	7440-42-8	
Calcium	<b>97100</b>	ug/L	100	36.0	1	06/14/17 17:00	06/19/17 17:19	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/14/17 17:00	06/19/17 17:19	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/14/17 17:00	06/19/17 17:19	7439-92-1	
Lithium	<b>22.8</b>	ug/L	10.0	2.9	1	06/14/17 17:00	06/19/17 17:19	7439-93-2	B
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	06/14/17 17:00	06/19/17 17:19	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/14/17 17:00	06/16/17 23:01	7440-36-0	
Arsenic	<b>&lt;0.052</b>	ug/L	1.0	0.052	1	06/14/17 17:00	06/16/17 23:01	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/14/17 17:00	06/16/17 23:01	7440-43-9	
Chromium	<b>0.17J</b>	ug/L	1.0	0.054	1	06/14/17 17:00	06/16/17 23:01	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/14/17 17:00	06/16/17 23:01	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/14/17 17:00	06/16/17 23:01	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 15:20	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>407</b>	mg/L	5.0	5.0	1		06/08/17 08:01		
<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		06/07/17 16:13		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>8.1</b>	mg/L	1.0	0.50	1		06/08/17 23:32	16887-00-6	
Fluoride	<b>0.27</b>	mg/L	0.20	0.10	1		06/08/17 23:32	16984-48-8	
Sulfate	<b>26.1</b>	mg/L	2.0	1.0	2		06/08/17 23:47	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-6D**      **Lab ID: 60245851003**      Collected: 06/06/17 15:00      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>112</b>	ug/L	5.0	0.91	1	06/16/17 10:25	06/16/17 16:44	7440-39-3	
Beryllium	<b>0.26J</b>	ug/L	1.0	0.16	1	06/16/17 10:25	06/16/17 16:44	7440-41-7	B
Boron	<b>781</b>	ug/L	100	3.5	1	06/16/17 10:25	06/16/17 16:44	7440-42-8	
Calcium	<b>69600</b>	ug/L	100	36.0	1	06/16/17 10:25	06/16/17 16:44	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/16/17 10:25	06/16/17 16:44	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/16/17 10:25	06/16/17 16:44	7439-92-1	
Lithium	<b>13.2</b>	ug/L	10.0	2.9	1	06/16/17 10:25	06/16/17 16:44	7439-93-2	
Molybdenum	<b>115</b>	ug/L	20.0	1.3	1	06/16/17 10:25	06/16/17 16:44	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/16/17 10:25	06/20/17 13:03	7440-36-0	
Arsenic	<b>0.14J</b>	ug/L	1.0	0.052	1	06/16/17 10:25	06/20/17 13:03	7440-38-2	
Cadmium	<b>0.030J</b>	ug/L	0.50	0.018	1	06/16/17 10:25	06/20/17 13:03	7440-43-9	
Chromium	<b>0.10J</b>	ug/L	1.0	0.054	1	06/16/17 10:25	06/20/17 13:03	7440-47-3	
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/16/17 10:25	06/20/17 13:03	7782-49-2	
Thallium	<b>0.11J</b>	ug/L	1.0	0.036	1	06/16/17 10:25	06/20/17 13:03	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 09:12	7439-97-6	
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>353</b>	mg/L	5.0	5.0	1		06/09/17 07:41		
<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		06/09/17 12:31		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.5</b>	mg/L	2.0	1.0	2		06/09/17 20:59	16887-00-6	
Fluoride	<b>0.37</b>	mg/L	0.20	0.10	1		06/09/17 00:03	16984-48-8	
Sulfate	<b>31.8</b>	mg/L	5.0	2.5	5		06/09/17 00:49	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 481141

Analysis Method: EPA 7470

QC Batch Method: EPA 7470

Analysis Description: 7470 Mercury

Associated Lab Samples: 60245851001, 60245851002

METHOD BLANK: 1970874

Matrix: Water

Associated Lab Samples: 60245851001, 60245851002

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		MSD		% Rec		% Rec Limits	Max		Qual
			Spike Conc.	MS Result	Spike Conc.	MSD Result	% Rec	% Rec		RPD	RPD	
Mercury	ug/L	<0.046	5	4.6	5	4.7	91	93	75-125	2	20	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

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QC Batch: 481494	Analysis Method: EPA 7470
QC Batch Method: EPA 7470	Analysis Description: 7470 Mercury
Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007	

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METHOD BLANK: 1972826 Matrix: Water  
Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.046	0.20	0.046	06/19/17 14:50	

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LABORATORY CONTROL SAMPLE: 1972827

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.4	88	80-120	

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MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1972828 1972829

Parameter	Units	60246016001 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	4.5	92	90	75-125	3	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 482248 Analysis Method: EPA 7470  
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury  
Associated Lab Samples: 60245851003

METHOD BLANK: 1975364 Matrix: Water  
Associated Lab Samples: 60245851003

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		MS		MSD		% Rec		Max		Qual	
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Mercury	ug/L	<0.046	5	5	5	4.8	4.4	95	87	75-125	9	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1975368 1975369

Parameter	Units	60246227005		MS		MSD		% Rec		Max		Qual	
		Result	Conc.	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD		RPD
Mercury	ug/L	0.054J	5	5	5	4.6	4.3	90	85	75-125	6	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 481055 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60245851001, 60245851002

METHOD BLANK: 1970475 Matrix: Water  
Associated Lab Samples: 60245851001, 60245851002

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 CTR-BOTT

Pace Project No.: 60246023

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 CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 481289 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60245851003, 60246023001

METHOD BLANK: 1971503 Matrix: Water  
Associated Lab Samples: 60245851003, 60246023001

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	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Barium	ug/L	112	1000	1000	1180	106	106	70-130	1	20	
Beryllium	ug/L	0.26J	1000	1000	1070	107	106	70-130	1	20	
Boron	ug/L	781	1000	1000	1760	98	95	70-130	2	20	
Calcium	ug/L	69600	10000	10000	80200	107	84	70-130	3	20	
Cobalt	ug/L	<0.73	1000	1000	1060	106	105	70-130	0	20	
Lead	ug/L	<2.4	1000	1000	1070	107	106	70-130	1	20	
Lithium	ug/L	13.2	1000	1000	1090	108	107	70-130	1	20	
Molybdenum	ug/L	115	1000	1000	1210	110	109	70-130	1	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

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 CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 481360 Analysis Method: EPA 200.7  
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
Associated Lab Samples: 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

METHOD BLANK: 1971823 Matrix: Water  
Associated Lab Samples: 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<0.91	5.0	0.91	06/20/17 18:05	
Beryllium	ug/L	0.31J	1.0	0.16	06/20/17 18:05	
Boron	ug/L	3.9J	100	3.5	06/20/17 18:05	
Calcium	ug/L	<36.0	100	36.0	06/20/17 18:05	
Cobalt	ug/L	<0.73	5.0	0.73	06/20/17 18:05	
Lead	ug/L	<2.4	5.0	2.4	06/20/17 18:05	
Lithium	ug/L	<2.9	10.0	2.9	06/20/17 18:05	
Molybdenum	ug/L	<1.3	20.0	1.3	06/20/17 18:05	

LABORATORY CONTROL SAMPLE: 1971824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	965	96	85-115	
Beryllium	ug/L	1000	982	98	85-115	
Boron	ug/L	1000	927	93	85-115	
Calcium	ug/L	10000	9650	97	85-115	
Cobalt	ug/L	1000	984	98	85-115	
Lead	ug/L	1000	985	98	85-115	
Lithium	ug/L	1000	945	94	85-115	
Molybdenum	ug/L	1000	994	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1971825 1971826

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60246016001 Result	Spike Conc.	Spike Conc.	MS Result						
Barium	ug/L	128	1000	1000	1150	1130	103	100	70-130	2	20
Beryllium	ug/L	<0.16	1000	1000	1050	1020	105	102	70-130	2	20
Boron	ug/L	351	1000	1000	1340	1340	99	98	70-130	0	20
Calcium	ug/L	74300	10000	10000	83900	83500	96	92	70-130	1	20
Cobalt	ug/L	0.89J	1000	1000	1020	994	101	99	70-130	2	20
Lead	ug/L	<2.4	1000	1000	1010	992	101	99	70-130	2	20
Lithium	ug/L	11.5	1000	1000	1030	1010	102	100	70-130	2	20
Molybdenum	ug/L	67.3	1000	1000	1110	1090	104	102	70-130	2	20

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

MATRIX SPIKE SAMPLE: 1971827		60246023002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Barium	ug/L	96.8	1000	1090	99	70-130	
Beryllium	ug/L	<0.16	1000	1010	101	70-130	
Boron	ug/L	24200	1000	25400	121	70-130	
Calcium	ug/L	244000	10000	254000	106	70-130	
Cobalt	ug/L	<0.73	1000	984	98	70-130	
Lead	ug/L	3.0J	1000	961	96	70-130	
Lithium	ug/L	18.6	1000	1050	103	70-130	
Molybdenum	ug/L	2170	1000	3160	99	70-130	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 481057 Analysis Method: EPA 200.8  
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
 Associated Lab Samples: 60245851001, 60245851002

METHOD BLANK: 1970480 Matrix: Water

Associated Lab Samples: 60245851001, 60245851002

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	MS		MSD		MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
		60245849009 Result	Spike Conc.	Spike Conc.	MSD Result							
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 CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 481290 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60245851003, 60246023001

METHOD BLANK: 1971508 Matrix: Water  
Associated Lab Samples: 60245851003, 60246023001

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		60246016002		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 CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 481363 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

METHOD BLANK: 1971832 Matrix: Water  
Associated Lab Samples: 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	06/20/17 14:11	
Arsenic	ug/L	<0.052	1.0	0.052	06/20/17 14:11	
Cadmium	ug/L	<0.018	0.50	0.018	06/20/17 14:11	
Chromium	ug/L	<0.054	1.0	0.054	06/20/17 14:11	
Selenium	ug/L	<0.086	1.0	0.086	06/20/17 14:11	
Thallium	ug/L	<0.036	1.0	0.036	06/20/17 14:11	

LABORATORY CONTROL SAMPLE: 1971833

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.4	96	85-115	
Arsenic	ug/L	40	38.2	95	85-115	
Cadmium	ug/L	40	38.4	96	85-115	
Chromium	ug/L	40	39.4	99	85-115	
Selenium	ug/L	40	38.8	97	85-115	
Thallium	ug/L	40	36.8	92	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1971834 1971835

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60246016001 Result	Spike Conc.	Spike Conc.	MS Result						
Antimony	ug/L	0.37J	40	40	38.9	38.6	96	96	70-130	1	20
Arsenic	ug/L	1.8	40	40	40.8	40.5	97	97	70-130	1	20
Cadmium	ug/L	0.063J	40	40	37.8	37.5	94	94	70-130	1	20
Chromium	ug/L	0.12J	40	40	39.2	38.9	98	97	70-130	1	20
Selenium	ug/L	1.5	40	40	39.0	38.4	94	92	70-130	2	20
Thallium	ug/L	0.10J	40	40	38.6	38.6	96	96	70-130	0	20

MATRIX SPIKE SAMPLE: 1971836

Parameter	Units	60246023003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.030J	40	37.9	95	70-130	
Arsenic	ug/L	0.23J	40	38.8	96	70-130	
Cadmium	ug/L	0.53	40	37.0	91	70-130	
Chromium	ug/L	0.67J	40	39.0	96	70-130	
Selenium	ug/L	0.17J	40	35.6	89	70-130	
Thallium	ug/L	0.052J	40	40.0	100	70-130	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch:	480117	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60245851002		

METHOD BLANK: 1966536 Matrix: Water

Associated Lab Samples: 60245851002

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 CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480253

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60245851001, 60245851003

METHOD BLANK: 1967043

Matrix: Water

Associated Lab Samples: 60245851001, 60245851003

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 CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480719

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

METHOD BLANK: 1969196

Matrix: Water

Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/13/17 09:30	

LABORATORY CONTROL SAMPLE: 1969197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	956	96	80-120	

SAMPLE DUPLICATE: 1969198

Parameter	Units	60246023002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1220	1210	1	10	

SAMPLE DUPLICATE: 1969199

Parameter	Units	60246063001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2420	2500	3	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480064 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60245851002

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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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480445 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60245851001, 60245851003, 60246023006

SAMPLE DUPLICATE: 1968061

Parameter	Units	60245851003 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 CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480652 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023007

SAMPLE DUPLICATE: 1969048

Parameter	Units	60246023007 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	5.3	5.4	1	5	H6

SAMPLE DUPLICATE: 1969049

Parameter	Units	60246016001 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-BOTT

Pace Project No.: 60246023

QC Batch: 480265 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60245851001, 60245851002, 60245851003

METHOD BLANK: 1967081 Matrix: Water  
 Associated Lab Samples: 60245851001, 60245851002, 60245851003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/08/17 21:59	
Fluoride	mg/L	<0.10	0.20	0.10	06/08/17 21:59	
Sulfate	mg/L	<0.50	1.0	0.50	06/08/17 21:59	

LABORATORY CONTROL SAMPLE: 1967082

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	2.6	106	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1967083 1967084

Parameter	Units	60245851003		60245851002		60245851001		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Fluoride	mg/L	0.37	2.5	2.5	3.0	3.0	104	104	80-120	0	15
Sulfate	mg/L	31.8	25	25	57.1	57.2	101	101	80-120	0	15

MATRIX SPIKE SAMPLE: 1967214

Parameter	Units	60246008001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	125	50	183	115	80-120	
Fluoride	mg/L	ND	25	25.9	103	80-120	
Sulfate	mg/L	27.5	50	76.9	99	80-120	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 480432	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60245851003	

METHOD BLANK: 1967966 Matrix: Water  
Associated Lab Samples: 60245851003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	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	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1967968 1967969

Parameter	Units	60245849009 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	Qual
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits	RPD	
Chloride	mg/L	10.9	5	5	16.6	16.6	114	114	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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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch:	480615	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007		

METHOD BLANK: 1968961 Matrix: Water  
Associated Lab Samples: 60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/12/17 08:52	
Fluoride	mg/L	<0.10	0.20	0.10	06/12/17 08:52	
Sulfate	mg/L	<0.50	1.0	0.50	06/12/17 08:52	

LABORATORY CONTROL SAMPLE: 1968962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1968963 1968964

Parameter	Units	60246016001		1968963		1968964		% Rec	% Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	20.5	25	25	25	46.8	46.6	105	104	80-120	0	15	
Fluoride	mg/L	0.26	2.5	2.5	2.5	2.8	2.8	102	103	80-120	1	15	
Sulfate	mg/L	49.2	25	25	25	74.8	74.6	102	101	80-120	0	15	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60246023

QC Batch: 480760 Analysis Method: EPA 300.0  
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
Associated Lab Samples: 60246023002, 60246023005

METHOD BLANK: 1969311 Matrix: Water  
Associated Lab Samples: 60246023002, 60246023005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	06/13/17 09:11	
Sulfate	mg/L	<0.50	1.0	0.50	06/13/17 09:11	

LABORATORY CONTROL SAMPLE: 1969312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Sulfate	mg/L	5	4.6	93	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1969313 1969314

Parameter	Units	60246271001		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Chloride	mg/L	18.1	50	50	66.8	66.5	98	97	80-120	1	15		
Sulfate	mg/L	64.9	50	50	114	114	99	98	80-120	0	15		

MATRIX SPIKE SAMPLE: 1969402

Parameter	Units	60246226001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	27.2	10	37.2	100	80-120	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.0552 ± 0.325 (0.663)</b> C:NA T:98%	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.367 ± 0.320 (0.642)</b> C:81% T:91%	pCi/L	06/26/17 15:14	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-2D**      **Lab ID: 60246023002**      Collected: 06/07/17 10:35      Received: 06/08/17 04:10      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>0.335 ± 0.381 (0.601)</b> <b>C:NA T:95%</b>	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.825 ± 0.386 (0.617)</b> <b>C:76% T:84%</b>	pCi/L	06/26/17 15:14	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-3D**      **Lab ID: 60246023003**      Collected: 06/07/17 09:40      Received: 06/08/17 04:10      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>0.318 ± 0.330 (0.492)</b> <b>C:NA T:98%</b>	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.833 ± 0.393 (0.645)</b> <b>C:77% T:85%</b>	pCi/L	06/26/17 15:14	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-4D**      **Lab ID: 60246023004**      Collected: 06/07/17 08:34      Received: 06/08/17 04:10      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>0.184 ± 0.319 (0.570)</b> <b>C:NA T:94%</b>	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.992 ± 0.417 (0.656)</b> <b>C:78% T:90%</b>	pCi/L	06/26/17 15:15	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-5D**      **Lab ID: 60246023005**      Collected: 06/07/17 08:45      Received: 06/08/17 04:10      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>0.225 ± 0.271 (0.414)</b> <b>C:NA T:96%</b>	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.967 ± 0.449 (0.756)</b> <b>C:79% T:85%</b>	pCi/L	06/26/17 15:15	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-DUP-1**      **Lab ID: 60246023006**      Collected: 06/07/17 08:00      Received: 06/08/17 04:10      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>0.292 ± 0.345 (0.543)</b> C:NA T:95%	pCi/L	06/21/17 21:42	13982-63-3	
Radium-228	EPA 904.0	<b>0.260 ± 0.316 (0.667)</b> C:77% T:91%	pCi/L	06/26/17 15:15	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-FB-1**      **Lab ID: 60246023007**      Collected: 06/07/17 08:32      Received: 06/08/17 04:10      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>0.297 ± 0.359 (0.547)</b> <b>C:NA T:73%</b>	pCi/L	06/21/17 21:56	13982-63-3	
Radium-228	EPA 904.0	<b>-0.148 ± 0.291 (0.729)</b> <b>C:76% T:79%</b>	pCi/L	06/26/17 15:15	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Sample: S-BMW-1D		Lab ID: 60245851001	Collected: 06/06/17 15:00	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>0.276 ± 0.288 (0.406)</b>		pCi/L	06/20/17 20:37	13982-63-3	
		<b>C:NA T:95%</b>					
Radium-228	EPA 904.0	<b>0.858 ± 0.555 (1.09)</b>		pCi/L	06/23/17 12:45	15262-20-1	
		<b>C:76% T:90%</b>					

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-BMW-3D**      **Lab ID: 60245851002**      Collected: 06/05/17 13:26      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>1.11 ± 0.517 (0.159)</b> <b>C:NA T:92%</b>	pCi/L	06/20/17 20:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.862 ± 0.488 (0.906)</b> <b>C:78% T:85%</b>	pCi/L	06/23/17 12:45	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-6D**      **Lab ID: 60245851003**      Collected: 06/06/17 15:00      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>0.361 ± 0.271 (0.140)</b> <b>C:NA T:101%</b>	pCi/L	06/20/17 20:37	13982-63-3	
Radium-228	EPA 904.0	<b>0.883 ± 0.520 (0.984)</b> <b>C:80% T:84%</b>	pCi/L	06/23/17 12:45	15262-20-1	

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**ANALYTICAL RESULTS - RADIOCHEMISTRY**

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-6D MS**      **Lab ID: 60245851004**      Collected: 06/06/17 15:00      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>79.5 %REC +/- NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	06/20/17 20:37	13982-63-3	
Radium-228	EPA 904.0	<b>89.68 %REC ± NA (NA)</b> <b>C:NA T:NA</b>	pCi/L	06/23/17 12:45	15262-20-1	

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### ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

**Sample: S-UMW-6D MSD**      **Lab ID: 60245851005**      Collected: 06/06/17 15:00      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>82.7 %REC 3.88 RPD +/- NA (NA)</b> C:NA T:NA	pCi/L	06/20/17 20:37	13982-63-3	
Radium-228	EPA 904.0	<b>88.96 %REC 0.81 RPD ±</b> NA (NA) C:NA T:NA	pCi/L	06/23/17 12:45	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

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QC Batch:	261763	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007		

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METHOD BLANK:	1288843	Matrix:	Water
Associated Lab Samples:	60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.361 ± 0.329 (0.665) C:77% T:81%	pCi/L	06/26/17 11:28	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 261523 Analysis Method: EPA 903.1

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

Associated Lab Samples: 60245851001, 60245851002, 60245851003, 60245851004, 60245851005

METHOD BLANK: 1287930 Matrix: Water

Associated Lab Samples: 60245851001, 60245851002, 60245851003, 60245851004, 60245851005

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 CTR-BOTT

Pace Project No.: 60246023

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QC Batch:	261663	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007		

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METHOD BLANK:	1288497	Matrix:	Water
Associated Lab Samples:	60246023001, 60246023002, 60246023003, 60246023004, 60246023005, 60246023006, 60246023007		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.445 ± 0.381 (0.516) C:NA T:99%	pCi/L	06/21/17 21:26	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

QC Batch: 261754 Analysis Method: EPA 904.0

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

Associated Lab Samples: 60245851001, 60245851002, 60245851003, 60245851004, 60245851005

METHOD BLANK: 1288829 Matrix: Water

Associated Lab Samples: 60245851001, 60245851002, 60245851003, 60245851004, 60245851005

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 CTR-BOTT

Pace Project No.: 60246023

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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

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-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60245851001	S-BMW-1D	EPA 200.7	481055	EPA 200.7	481081
60245851002	S-BMW-3D	EPA 200.7	481055	EPA 200.7	481081
60245851003	S-UMW-6D	EPA 200.7	481289	EPA 200.7	481371
60246023001	S-UMW-1D	EPA 200.7	481289	EPA 200.7	481371
60246023002	S-UMW-2D	EPA 200.7	481360	EPA 200.7	481503
60246023003	S-UMW-3D	EPA 200.7	481360	EPA 200.7	481503
60246023004	S-UMW-4D	EPA 200.7	481360	EPA 200.7	481503
60246023005	S-UMW-5D	EPA 200.7	481360	EPA 200.7	481503
60246023006	S-UMW-DUP-1	EPA 200.7	481360	EPA 200.7	481503
60246023007	S-UMW-FB-1	EPA 200.7	481360	EPA 200.7	481503
60245851001	S-BMW-1D	EPA 200.8	481057	EPA 200.8	481080
60245851002	S-BMW-3D	EPA 200.8	481057	EPA 200.8	481080
60245851003	S-UMW-6D	EPA 200.8	481290	EPA 200.8	481370
60246023001	S-UMW-1D	EPA 200.8	481290	EPA 200.8	481370
60246023002	S-UMW-2D	EPA 200.8	481363	EPA 200.8	481509
60246023003	S-UMW-3D	EPA 200.8	481363	EPA 200.8	481509
60246023004	S-UMW-4D	EPA 200.8	481363	EPA 200.8	481509
60246023005	S-UMW-5D	EPA 200.8	481363	EPA 200.8	481509
60246023006	S-UMW-DUP-1	EPA 200.8	481363	EPA 200.8	481509
60246023007	S-UMW-FB-1	EPA 200.8	481363	EPA 200.8	481509
60245851001	S-BMW-1D	EPA 7470	481141	EPA 7470	481323
60245851002	S-BMW-3D	EPA 7470	481141	EPA 7470	481323
60245851003	S-UMW-6D	EPA 7470	482248	EPA 7470	482262
60246023001	S-UMW-1D	EPA 7470	481494	EPA 7470	481550
60246023002	S-UMW-2D	EPA 7470	481494	EPA 7470	481550
60246023003	S-UMW-3D	EPA 7470	481494	EPA 7470	481550
60246023004	S-UMW-4D	EPA 7470	481494	EPA 7470	481550
60246023005	S-UMW-5D	EPA 7470	481494	EPA 7470	481550
60246023006	S-UMW-DUP-1	EPA 7470	481494	EPA 7470	481550
60246023007	S-UMW-FB-1	EPA 7470	481494	EPA 7470	481550
60245851001	S-BMW-1D	EPA 903.1	261523		
60245851002	S-BMW-3D	EPA 903.1	261523		
60245851003	S-UMW-6D	EPA 903.1	261523		
60245851004	S-UMW-6D MS	EPA 903.1	261523		
60245851005	S-UMW-6D MSD	EPA 903.1	261523		
60246023001	S-UMW-1D	EPA 903.1	261663		
60246023002	S-UMW-2D	EPA 903.1	261663		
60246023003	S-UMW-3D	EPA 903.1	261663		
60246023004	S-UMW-4D	EPA 903.1	261663		
60246023005	S-UMW-5D	EPA 903.1	261663		
60246023006	S-UMW-DUP-1	EPA 903.1	261663		
60246023007	S-UMW-FB-1	EPA 903.1	261663		
60245851001	S-BMW-1D	EPA 904.0	261754		

### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60245851002	S-BMW-3D	EPA 904.0	261754		
60245851003	S-UMW-6D	EPA 904.0	261754		
60245851004	S-UMW-6D MS	EPA 904.0	261754		
60245851005	S-UMW-6D MSD	EPA 904.0	261754		
60246023001	S-UMW-1D	EPA 904.0	261763		
60246023002	S-UMW-2D	EPA 904.0	261763		
60246023003	S-UMW-3D	EPA 904.0	261763		
60246023004	S-UMW-4D	EPA 904.0	261763		
60246023005	S-UMW-5D	EPA 904.0	261763		
60246023006	S-UMW-DUP-1	EPA 904.0	261763		
60246023007	S-UMW-FB-1	EPA 904.0	261763		
60245851001	S-BMW-1D	SM 2540C	480253		
60245851002	S-BMW-3D	SM 2540C	480117		
60245851003	S-UMW-6D	SM 2540C	480253		
60246023001	S-UMW-1D	SM 2540C	480719		
60246023002	S-UMW-2D	SM 2540C	480719		
60246023003	S-UMW-3D	SM 2540C	480719		
60246023004	S-UMW-4D	SM 2540C	480719		
60246023005	S-UMW-5D	SM 2540C	480719		
60246023006	S-UMW-DUP-1	SM 2540C	480719		
60246023007	S-UMW-FB-1	SM 2540C	480719		
60245851001	S-BMW-1D	SM 4500-H+B	480445		
60245851002	S-BMW-3D	SM 4500-H+B	480064		
60245851003	S-UMW-6D	SM 4500-H+B	480445		
60246023001	S-UMW-1D	SM 4500-H+B	480652		
60246023002	S-UMW-2D	SM 4500-H+B	480652		
60246023003	S-UMW-3D	SM 4500-H+B	480652		
60246023004	S-UMW-4D	SM 4500-H+B	480652		
60246023005	S-UMW-5D	SM 4500-H+B	480652		
60246023006	S-UMW-DUP-1	SM 4500-H+B	480445		
60246023007	S-UMW-FB-1	SM 4500-H+B	480652		
60245851001	S-BMW-1D	EPA 300.0	480265		
60245851002	S-BMW-3D	EPA 300.0	480265		
60245851003	S-UMW-6D	EPA 300.0	480265		
60245851003	S-UMW-6D	EPA 300.0	480432		
60246023001	S-UMW-1D	EPA 300.0	480615		
60246023002	S-UMW-2D	EPA 300.0	480615		
60246023002	S-UMW-2D	EPA 300.0	480760		
60246023003	S-UMW-3D	EPA 300.0	480615		
60246023004	S-UMW-4D	EPA 300.0	480615		
60246023005	S-UMW-5D	EPA 300.0	480615		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60246023

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60246023005	S-UMW-5D	EPA 300.0	480760		
60246023006	S-UMW-DUP-1	EPA 300.0	480615		
60246023007	S-UMW-FB-1	EPA 300.0	480615		

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Sample Condition Upon Receipt

WO#: 60246023



60246023

Client Name: Goldor

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 1.6 / 13.2 Corr. Factor CF +2.9 / CF +0.2 Corrected 1.6 / 13.4

Date and initials of person examining contents: RB 6/8/17

Temperature should be above freezing to 6°C

Chain of Custody present:	<input 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>JK</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>W)</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	<u>RB 6/8</u>
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: Jamie Chack \_\_\_\_\_ Date: 6/9/17

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





July 18, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR-BOTT  
Pace Project No.: 60247465

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-BOTT

Pace Project No.: 60247465

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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-BOTT

Pace Project No.: 60247465

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Lab ID	Sample ID	Matrix	Date Collected	Date Received
60247465001	S-BMW-3D	Water	06/26/17 16:00	06/28/17 03:30

### REPORT OF LABORATORY ANALYSIS

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60247465

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60247465001	S-BMW-3D	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-BOTT

Pace Project No.: 60247465

**Sample: S-BMW-3D**      **Lab ID: 60247465001**      Collected: 06/26/17 16:00      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>668</b>	ug/L	5.0	0.91	1	06/28/17 16:50	06/30/17 19:32	7440-39-3	
Beryllium	<b>&lt;0.16</b>	ug/L	1.0	0.16	1	06/28/17 16:50	06/30/17 19:32	7440-41-7	B
Boron	<b>55.2J</b>	ug/L	100	3.5	1	06/28/17 16:50	06/30/17 19:32	7440-42-8	
Calcium	<b>102000</b>	ug/L	100	36.0	1	06/28/17 16:50	06/30/17 19:32	7440-70-2	
Cobalt	<b>&lt;0.73</b>	ug/L	5.0	0.73	1	06/28/17 16:50	06/30/17 19:32	7440-48-4	
Lead	<b>&lt;2.4</b>	ug/L	5.0	2.4	1	06/28/17 16:50	06/30/17 19:32	7439-92-1	
Lithium	<b>25.3</b>	ug/L	10.0	2.9	1	06/28/17 16:50	06/30/17 19:32	7439-93-2	
Molybdenum	<b>&lt;1.3</b>	ug/L	20.0	1.3	1	06/28/17 16:50	06/30/17 19:32	7439-98-7	
<b>200.8 MET ICPMS</b>		Analytical Method: EPA 200.8    Preparation Method: EPA 200.8							
Antimony	<b>&lt;0.026</b>	ug/L	1.0	0.026	1	06/28/17 16:50	06/30/17 13:52	7440-36-0	
Arsenic	<b>&lt;0.052</b>	ug/L	1.0	0.052	1	06/28/17 16:50	06/30/17 13:52	7440-38-2	
Cadmium	<b>&lt;0.018</b>	ug/L	0.50	0.018	1	06/28/17 16:50	06/30/17 13:52	7440-43-9	
Chromium	<b>0.31J</b>	ug/L	1.0	0.054	1	06/28/17 16:50	06/30/17 13:52	7440-47-3	B
Selenium	<b>&lt;0.086</b>	ug/L	1.0	0.086	1	06/28/17 16:50	06/30/17 13:52	7782-49-2	
Thallium	<b>&lt;0.036</b>	ug/L	1.0	0.036	1	06/28/17 16:50	06/30/17 13:52	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 09:03	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		06/29/17 16:24		
<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		06/28/17 13:17		H6
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>7.8</b>	mg/L	1.0	0.50	1		07/08/17 00:43	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.10	1		07/08/17 00:43	16984-48-8	
Sulfate	<b>26.4</b>	mg/L	2.0	1.0	2		07/08/17 10:34	14808-79-8	

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60247465

QC Batch: 484651	Analysis Method: EPA 7470
QC Batch Method: EPA 7470	Analysis Description: 7470 Mercury
Associated Lab Samples: 60247465001	

METHOD BLANK: 1985098 Matrix: Water  
Associated Lab Samples: 60247465001

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 % Rec	MSD % Rec	% Rec Limits	Max RPD	Max RPD	Qual
			Spike Conc.	MS Result	MSD Spike Conc.	MSD Result						
Mercury	ug/L	ND	5	5	4.7	4.4	94	89	75-125	5	20	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60247465

QC Batch: 483134 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60247465001

METHOD BLANK: 1979063 Matrix: Water  
 Associated Lab Samples: 60247465001

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-BOTT  
Pace Project No.: 60247465

QC Batch: 483133 Analysis Method: EPA 200.8  
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET  
Associated Lab Samples: 60247465001

METHOD BLANK: 1979050 Matrix: Water  
Associated Lab Samples: 60247465001

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-BOTT

Pace Project No.: 60247465

QC Batch: 483338

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60247465001

METHOD BLANK: 1979902

Matrix: Water

Associated Lab Samples: 60247465001

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-BOTT

Pace Project No.: 60247465

QC Batch: 482985 Analysis Method: SM 4500-H+B

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

Associated Lab Samples: 60247465001

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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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60247465

QC Batch: 484403	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60247465001	

METHOD BLANK: 1984134 Matrix: Water  
Associated Lab Samples: 60247465001

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	13.2	107	110	80-120	1	15
Fluoride	mg/L	0.21	2.5	2.5	2.8	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-BOTT

Pace Project No.: 60247465

QC Batch:	484481	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60247465001		

METHOD BLANK: 1984615 Matrix: Water  
Associated Lab Samples: 60247465001

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 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
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-BOTT

Pace Project No.: 60247465

**Sample: S-BMW-3D**      **Lab ID: 60247465001**      Collected: 06/26/17 16:00      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>0.897 ± 0.498 (0.187)</b> <b>C:NA T:96%</b>	pCi/L	07/12/17 11:23	13982-63-3	
Radium-228	EPA 904.0	<b>1.64 ± 0.641 (0.985)</b> <b>C:79% T:80%</b>	pCi/L	07/17/17 18:39	15262-20-1	

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### QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN SIOUX ENERGY CTR-BOTT

Pace Project No.: 60247465

QC Batch: 264503

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60247465001

METHOD BLANK: 1302867

Matrix: Water

Associated Lab Samples: 60247465001

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-BOTT

Pace Project No.: 60247465

QC Batch: 264096

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 60247465001

METHOD BLANK: 1300978

Matrix: Water

Associated Lab Samples: 60247465001

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-BOTT

Pace Project No.: 60247465

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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-BOTT

Pace Project No.: 60247465

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60247465001	S-BMW-3D	EPA 200.7	483134	EPA 200.7	483166
60247465001	S-BMW-3D	EPA 200.8	483133	EPA 200.8	483165
60247465001	S-BMW-3D	EPA 7470	484651	EPA 7470	484817
60247465001	S-BMW-3D	EPA 903.1	264096		
60247465001	S-BMW-3D	EPA 904.0	264503		
60247465001	S-BMW-3D	SM 2540C	483338		
60247465001	S-BMW-3D	SM 4500-H+B	482985		
60247465001	S-BMW-3D	EPA 300.0	484403		
60247465001	S-BMW-3D	EPA 300.0	484481		

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Sample Condition Upon Receipt

WO#: 60247465
Barcode
60247465

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 1.4/14.0 Corr. Factor CF +2.9 CF +0.2 Corrected 1.6/14.2

Date and initials of person examining contents: 6/28/17

Temperature should be above freezing to 6°C

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 (<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, 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 Choe 6/28/17

Date:



December 04, 2017

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

RE: Project: AMEREN SIOUX ENERGY CTR- BOTT  
Pace Project No.: 60258160

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- BOTT

Pace Project No.: 60258160

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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- BOTT

Pace Project No.: 60258160

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60258160001	S-UMW-1D	Water	11/14/17 14:23	11/15/17 04:15
60258160002	S-UMW-2D	Water	11/13/17 14:18	11/15/17 04:15
60258160003	S-UMW-3D	Water	11/13/17 13:05	11/15/17 04:15
60258160004	S-UMW-4D	Water	11/13/17 12:05	11/15/17 04:15
60258160005	S-UMW-5D	Water	11/13/17 14:15	11/15/17 04:15
60258160006	S-UMW-6D	Water	11/13/17 15:50	11/15/17 04:15
60258160007	S-BMW-1D	Water	11/13/17 10:58	11/15/17 04:15
60258160008	S-BMW-3D	Water	11/13/17 08:45	11/15/17 04:15
60258160009	S-UMW-DUP-1	Water	11/13/17 08:45	11/15/17 04:15
60258160010	S-UMW-FB-1	Water	11/13/17 15:20	11/15/17 04:15

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60258160001	S-UMW-1D	EPA 200.7	TDS	7	PASI-K
		SM 2320B	JSS	1	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60258160002	S-UMW-2D	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
60258160003	S-UMW-3D	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
60258160004	S-UMW-4D	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
60258160005	S-UMW-5D	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
60258160006	S-UMW-6D	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
60258160007	S-BMW-1D	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
60258160008	S-BMW-3D	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
60258160009	S-UMW-DUP-1	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
60258160010	S-UMW-FB-1	EPA 200.7	TDS	7	PASI-K

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### SAMPLE ANALYTE COUNT

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		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- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-1D**      **Lab ID: 60258160001**      Collected: 11/14/17 14:23      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>266</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 16:12	7440-42-8	B
Calcium	<b>71200</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 16:12	7440-70-2	
Iron	<b>677</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 16:12	7439-89-6	
Magnesium	<b>21300</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 16:12	7439-95-4	
Manganese	<b>125</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 16:12	7439-96-5	
Potassium	<b>5320</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 16:12	7440-09-7	
Sodium	<b>14500</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 16:12	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>207</b>	mg/L	20.0	4.9	1		11/27/17 11:53		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>318</b>	mg/L	5.0	5.0	1		11/21/17 09:29		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>18.7</b>	mg/L	2.0	1.0	2		12/02/17 15:19	16887-00-6	
Fluoride	<b>0.41</b>	mg/L	0.20	0.10	1		12/01/17 12:50	16984-48-8	
Sulfate	<b>49.1</b>	mg/L	5.0	2.5	5		12/03/17 10:04	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-2D**      **Lab ID: 60258160002**      Collected: 11/13/17 14:18      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>22100</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:27	7440-42-8	
Calcium	<b>224000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:27	7440-70-2	
Iron	<b>385</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:27	7439-89-6	
Magnesium	<b>11400</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:27	7439-95-4	
Manganese	<b>287</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:27	7439-96-5	
Potassium	<b>24400</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:27	7440-09-7	
Sodium	<b>69800</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:27	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>84.3</b>	mg/L	20.0	4.9	1		11/17/17 19:09		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1000</b>	mg/L	5.0	5.0	1		11/17/17 15:33		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.3</b>	mg/L	2.0	1.0	2		12/02/17 17:14	16887-00-6	
Fluoride	<b>0.70</b>	mg/L	0.20	0.10	1		12/01/17 13:34	16984-48-8	
Sulfate	<b>722</b>	mg/L	50.0	25.0	50		12/03/17 10:47	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-3D**      **Lab ID: 60258160003**      Collected: 11/13/17 13:05      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>24100</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:29	7440-42-8	
Calcium	<b>237000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:29	7440-70-2	
Iron	<b>1030</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:29	7439-89-6	
Magnesium	<b>5750</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:29	7439-95-4	
Manganese	<b>476</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:29	7439-96-5	
Potassium	<b>18400</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:29	7440-09-7	
Sodium	<b>81300</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:29	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>146</b>	mg/L	20.0	4.9	1		11/21/17 10:14		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1150</b>	mg/L	5.0	5.0	1		11/17/17 15:34		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>20.4</b>	mg/L	2.0	1.0	2		12/02/17 17:43	16887-00-6	
Fluoride	<b>1.0</b>	mg/L	0.20	0.10	1		12/01/17 13:49	16984-48-8	
Sulfate	<b>710</b>	mg/L	50.0	25.0	50		12/03/17 11:01	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-4D**      **Lab ID: 60258160004**      Collected: 11/13/17 12:05      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>27000</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:32	7440-42-8	
Calcium	<b>192000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:32	7440-70-2	
Iron	<b>7680</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:32	7439-89-6	
Magnesium	<b>25300</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:32	7439-95-4	
Manganese	<b>1650</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:32	7439-96-5	
Potassium	<b>15100</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:32	7440-09-7	
Sodium	<b>71600</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:32	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<b>191</b>	mg/L	20.0	4.9	1		11/21/17 10:21		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1010</b>	mg/L	5.0	5.0	1		11/17/17 15:36		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.4</b>	mg/L	2.0	1.0	2		12/02/17 18:12	16887-00-6	
Fluoride	<b>0.80</b>	mg/L	0.20	0.10	1		12/01/17 14:04	16984-48-8	
Sulfate	<b>544</b>	mg/L	50.0	25.0	50		12/03/17 11:43	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-5D**      **Lab ID: 60258160005**      Collected: 11/13/17 14:15      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>3450</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:34	7440-42-8	
Calcium	<b>70000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:34	7440-70-2	
Iron	<b>3300</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:34	7439-89-6	
Magnesium	<b>15800</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:34	7439-95-4	
Manganese	<b>414</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:34	7439-96-5	
Potassium	<b>9120</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:34	7440-09-7	
Sodium	<b>17800</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:34	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>227</b>	mg/L	20.0	4.9	1		11/21/17 10:30		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>310</b>	mg/L	5.0	5.0	1		11/17/17 15:36		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>25.8</b>	mg/L	2.0	1.0	2		12/02/17 19:09	16887-00-6	
Fluoride	<b>0.55</b>	mg/L	0.20	0.10	1		12/01/17 14:19	16984-48-8	
Sulfate	<b>18.3</b>	mg/L	1.0	0.50	1		12/01/17 14:19	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-6D**      **Lab ID: 60258160006**      Collected: 11/13/17 15:50      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>1130</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:36	7440-42-8	
Calcium	<b>81400</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:36	7440-70-2	
Iron	<b>5990</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:36	7439-89-6	
Magnesium	<b>19700</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:36	7439-95-4	
Manganese	<b>442</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:36	7439-96-5	
Potassium	<b>4370</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:36	7440-09-7	
Sodium	<b>13600</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:36	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>198</b>	mg/L	20.0	4.9	1		11/21/17 10:34		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>353</b>	mg/L	5.0	5.0	1		11/17/17 15:45		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>18.2</b>	mg/L	1.0	0.50	1		12/01/17 14:34	16887-00-6	
Fluoride	<b>0.43</b>	mg/L	0.20	0.10	1		12/01/17 14:34	16984-48-8	
Sulfate	<b>86.4</b>	mg/L	10.0	5.0	10		12/03/17 11:57	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-BMW-1D**      **Lab ID: 60258160007**      Collected: 11/13/17 10:58      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>241</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:38	7440-42-8	B
Calcium	<b>131000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:38	7440-70-2	
Iron	<b>9790</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:38	7439-89-6	
Magnesium	<b>28400</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:38	7439-95-4	
Manganese	<b>1060</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:38	7439-96-5	
Potassium	<b>2520</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:38	7440-09-7	
Sodium	<b>6360</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:38	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>394</b>	mg/L	20.0	4.9	1		11/21/17 10:40		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>450</b>	mg/L	5.0	5.0	1		11/17/17 15:45		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>5.2</b>	mg/L	1.0	0.50	1		12/01/17 14:49	16887-00-6	
Fluoride	<b>0.28</b>	mg/L	0.20	0.10	1		12/01/17 14:49	16984-48-8	
Sulfate	<b>37.6</b>	mg/L	2.0	1.0	2		12/03/17 12:12	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-BMW-3D**      **Lab ID: 60258160008**      Collected: 11/13/17 08:45      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>109</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:41	7440-42-8	B
Calcium	<b>110000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:41	7440-70-2	
Iron	<b>7740</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:41	7439-89-6	
Magnesium	<b>25400</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:41	7439-95-4	
Manganese	<b>518</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:41	7439-96-5	
Potassium	<b>3550</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:41	7440-09-7	
Sodium	<b>6110</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:41	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>344</b>	mg/L	20.0	4.9	1		11/21/17 10:45		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>409</b>	mg/L	5.0	5.0	1		11/17/17 15:46		
<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		12/01/17 15:04	16887-00-6	
Fluoride	<b>0.29</b>	mg/L	0.20	0.10	1		12/01/17 15:04	16984-48-8	
Sulfate	<b>27.5</b>	mg/L	2.0	1.0	2		12/03/17 12:26	14808-79-8	

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## ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-DUP-1**      **Lab ID: 60258160009**      Collected: 11/13/17 08:45      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>21700</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:43	7440-42-8	
Calcium	<b>222000</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:43	7440-70-2	
Iron	<b>380</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:43	7439-89-6	
Magnesium	<b>11200</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:43	7439-95-4	
Manganese	<b>284</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:43	7439-96-5	
Potassium	<b>24000</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:43	7440-09-7	
Sodium	<b>68500</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:43	7440-23-5	
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO <sub>3</sub>	<b>87.4</b>	mg/L	20.0	4.9	1		11/21/17 10:59		
<b>2540C Total Dissolved Solids</b>		Analytical Method: SM 2540C							
Total Dissolved Solids	<b>1110</b>	mg/L	5.0	5.0	1		11/17/17 15:46		
<b>300.0 IC Anions 28 Days</b>		Analytical Method: EPA 300.0							
Chloride	<b>19.4</b>	mg/L	2.0	1.0	2		12/02/17 20:07	16887-00-6	
Fluoride	<b>0.70</b>	mg/L	0.20	0.10	1		12/01/17 15:48	16984-48-8	
Sulfate	<b>720</b>	mg/L	50.0	25.0	50		12/03/17 12:40	14808-79-8	

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### ANALYTICAL RESULTS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

**Sample: S-UMW-FB-1**      **Lab ID: 60258160010**      Collected: 11/13/17 15:20      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>98.1J</b>	ug/L	100	3.5	1	11/18/17 12:30	11/26/17 14:45	7440-42-8	B
Calcium	<b>39.4J</b>	ug/L	100	36.0	1	11/18/17 12:30	11/26/17 14:45	7440-70-2	
Iron	<b>&lt;12.4</b>	ug/L	50.0	12.4	1	11/18/17 12:30	11/26/17 14:45	7439-89-6	
Magnesium	<b>&lt;15.4</b>	ug/L	50.0	15.4	1	11/18/17 12:30	11/26/17 14:45	7439-95-4	
Manganese	<b>&lt;1.8</b>	ug/L	5.0	1.8	1	11/18/17 12:30	11/26/17 14:45	7439-96-5	
Potassium	<b>&lt;52.3</b>	ug/L	500	52.3	1	11/18/17 12:30	11/26/17 14:45	7440-09-7	
Sodium	<b>41.2J</b>	ug/L	500	28.4	1	11/18/17 12:30	11/26/17 14:45	7440-23-5	B
<b>2320B Alkalinity</b>		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<b>&lt;4.9</b>	mg/L	20.0	4.9	1		11/21/17 11:04		
<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		11/17/17 15:56		
<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		12/01/17 16:03	16887-00-6	
Fluoride	<b>&lt;0.10</b>	mg/L	0.20	0.10	1		12/01/17 16:03	16984-48-8	
Sulfate	<b>0.65J</b>	mg/L	1.0	0.50	1		12/01/17 16:03	14808-79-8	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 503852 Analysis Method: EPA 200.7  
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total  
 Associated Lab Samples: 60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

METHOD BLANK: 2063356 Matrix: Water  
 Associated Lab Samples: 60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	93.1J	100	3.5	11/26/17 16:10	
Calcium	ug/L	<36.0	100	36.0	11/26/17 16:10	
Iron	ug/L	<12.4	50.0	12.4	11/26/17 16:10	
Magnesium	ug/L	18.0J	50.0	15.4	11/26/17 16:10	
Manganese	ug/L	<1.8	5.0	1.8	11/26/17 16:10	
Potassium	ug/L	<52.3	500	52.3	11/26/17 16:10	
Sodium	ug/L	81.9J	500	28.4	11/26/17 16:10	

LABORATORY CONTROL SAMPLE: 2063357

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1060	106	85-115	
Calcium	ug/L	10000	10500	105	85-115	
Iron	ug/L	10000	10600	106	85-115	
Magnesium	ug/L	10000	10300	103	85-115	
Manganese	ug/L	1000	1040	104	85-115	
Potassium	ug/L	10000	10400	104	85-115	
Sodium	ug/L	10000	10200	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2063358 2063359

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60258160001 Result	Spike Conc.	Spike Conc.	MS Result						
Boron	ug/L	266	1000	1000	1300	1300	103	103	70-130	0	20
Calcium	ug/L	71200	10000	10000	82200	81800	109	106	70-130	0	20
Iron	ug/L	677	10000	10000	11000	11000	103	103	70-130	0	20
Magnesium	ug/L	21300	10000	10000	31700	31800	104	105	70-130	0	20
Manganese	ug/L	125	1000	1000	1150	1150	102	103	70-130	0	20
Potassium	ug/L	5320	10000	10000	15600	15500	102	102	70-130	0	20
Sodium	ug/L	14500	10000	10000	24900	24900	104	104	70-130	0	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 CTR- BOTT

Pace Project No.: 60258160

QC Batch: 503814

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60258160002

METHOD BLANK: 2062994

Matrix: Water

Associated Lab Samples: 60258160002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	<4.9	20.0	4.9	11/17/17 16:47	

LABORATORY CONTROL SAMPLE: 2062995

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	500	523	105	90-110	

SAMPLE DUPLICATE: 2062996

Parameter	Units	60258189001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	ND	595		10	

SAMPLE DUPLICATE: 2062997

Parameter	Units	60258155003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	367	376	3	10	

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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 504168

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

METHOD BLANK: 2065064

Matrix: Water

Associated Lab Samples: 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/21/17 10:11	

LABORATORY CONTROL SAMPLE: 2065065

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	455	91	90-110	

SAMPLE DUPLICATE: 2065066

Parameter	Units	60258160003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	146	151	3	10	

SAMPLE DUPLICATE: 2065067

Parameter	Units	60258160004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	191	189	1	10	

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 504644

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60258160001

METHOD BLANK: 2067574

Matrix: Water

Associated Lab Samples: 60258160001

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 10:18	

LABORATORY CONTROL SAMPLE: 2067575

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	500	492	98	90-110	

SAMPLE DUPLICATE: 2067576

Parameter	Units	60258156006 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	416	431	3	10	

SAMPLE DUPLICATE: 2067577

Parameter	Units	60258160001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	207	217	5	10	

SAMPLE DUPLICATE: 2067578

Parameter	Units	60258162001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO <sub>3</sub>	mg/L	261	269	3	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch:	503795	Analysis Method:	SM 2540C
QC Batch Method:	SM 2540C	Analysis Description:	2540C Total Dissolved Solids
Associated Lab Samples:	60258160002		

METHOD BLANK: 2062895 Matrix: Water

Associated Lab Samples: 60258160002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/17/17 15:23	

LABORATORY CONTROL SAMPLE: 2062896

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

SAMPLE DUPLICATE: 2062897

Parameter	Units	60258148001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	967	959	1	10	

SAMPLE DUPLICATE: 2062898

Parameter	Units	60258155004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6260	6660	6	10	

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**REPORT OF LABORATORY ANALYSIS**

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 503799

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

METHOD BLANK: 2062903

Matrix: Water

Associated Lab Samples: 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010

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	

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	

SAMPLE DUPLICATE: 2062905

Parameter	Units	60258160003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1150	1060	8	10	

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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### REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 504121

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60258160001

METHOD BLANK: 2064804

Matrix: Water

Associated Lab Samples: 60258160001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/21/17 09:15	

LABORATORY CONTROL SAMPLE: 2064805

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	964	96	80-120	

SAMPLE DUPLICATE: 2064806

Parameter	Units	60258156006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	528	547	3	10	

SAMPLE DUPLICATE: 2064807

Parameter	Units	60258160001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	318	313	2	10	

SAMPLE DUPLICATE: 2064808

Parameter	Units	60258162001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	471	474	1	10	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch:	505276	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010		

METHOD BLANK:	2069448	Matrix:	Water
Associated Lab Samples:	60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160006, 60258160007, 60258160008, 60258160009, 60258160010		

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	
Sulfate	mg/L	<0.50	1.0	0.50	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	
Sulfate	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2069450 2069451

Parameter	Units	60258160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.41	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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### QUALITY CONTROL DATA

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch: 505661 Analysis Method: EPA 300.0  
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions  
 Associated Lab Samples: 60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160009

METHOD BLANK: 2071155 Matrix: Water  
 Associated Lab Samples: 60258160001, 60258160002, 60258160003, 60258160004, 60258160005, 60258160009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	12/02/17 14:50	

LABORATORY CONTROL SAMPLE: 2071156

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2071157 2071158

Parameter	Units	60258160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.7	10	10	28.5	28.4	98	97	80-120	0	15	

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**QUALITY CONTROL DATA**

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

QC Batch:	505709	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60258160001, 60258160002, 60258160003, 60258160004, 60258160006, 60258160007, 60258160008, 60258160009		

METHOD BLANK:	2071670	Matrix:	Water
Associated Lab Samples:	60258160001, 60258160002, 60258160003, 60258160004, 60258160006, 60258160007, 60258160008, 60258160009		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.50	1.0	0.50	12/03/17 07:54	

LABORATORY CONTROL SAMPLE: 2071671

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2071672 2071673

Parameter	Units	2071672		2071673		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60258160001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result							MSD Result
Sulfate	mg/L	49.1	25	25	69.9	69.2	83	80	80-120	1	15	

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## QUALIFIERS

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

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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

B Analyte was detected in the associated method blank.

## REPORT OF LABORATORY ANALYSIS

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60258160001	S-UMW-1D	EPA 200.7	503852	EPA 200.7	503863
60258160002	S-UMW-2D	EPA 200.7	503852	EPA 200.7	503863
60258160003	S-UMW-3D	EPA 200.7	503852	EPA 200.7	503863
60258160004	S-UMW-4D	EPA 200.7	503852	EPA 200.7	503863
60258160005	S-UMW-5D	EPA 200.7	503852	EPA 200.7	503863
60258160006	S-UMW-6D	EPA 200.7	503852	EPA 200.7	503863
60258160007	S-BMW-1D	EPA 200.7	503852	EPA 200.7	503863
60258160008	S-BMW-3D	EPA 200.7	503852	EPA 200.7	503863
60258160009	S-UMW-DUP-1	EPA 200.7	503852	EPA 200.7	503863
60258160010	S-UMW-FB-1	EPA 200.7	503852	EPA 200.7	503863
60258160001	S-UMW-1D	SM 2320B	504644		
60258160002	S-UMW-2D	SM 2320B	503814		
60258160003	S-UMW-3D	SM 2320B	504168		
60258160004	S-UMW-4D	SM 2320B	504168		
60258160005	S-UMW-5D	SM 2320B	504168		
60258160006	S-UMW-6D	SM 2320B	504168		
60258160007	S-BMW-1D	SM 2320B	504168		
60258160008	S-BMW-3D	SM 2320B	504168		
60258160009	S-UMW-DUP-1	SM 2320B	504168		
60258160010	S-UMW-FB-1	SM 2320B	504168		
60258160001	S-UMW-1D	SM 2540C	504121		
60258160002	S-UMW-2D	SM 2540C	503795		
60258160003	S-UMW-3D	SM 2540C	503799		
60258160004	S-UMW-4D	SM 2540C	503799		
60258160005	S-UMW-5D	SM 2540C	503799		
60258160006	S-UMW-6D	SM 2540C	503799		
60258160007	S-BMW-1D	SM 2540C	503799		
60258160008	S-BMW-3D	SM 2540C	503799		
60258160009	S-UMW-DUP-1	SM 2540C	503799		
60258160010	S-UMW-FB-1	SM 2540C	503799		
60258160001	S-UMW-1D	EPA 300.0	505276		
60258160001	S-UMW-1D	EPA 300.0	505661		
60258160001	S-UMW-1D	EPA 300.0	505709		
60258160002	S-UMW-2D	EPA 300.0	505276		
60258160002	S-UMW-2D	EPA 300.0	505661		
60258160002	S-UMW-2D	EPA 300.0	505709		
60258160003	S-UMW-3D	EPA 300.0	505276		
60258160003	S-UMW-3D	EPA 300.0	505661		
60258160003	S-UMW-3D	EPA 300.0	505709		
60258160004	S-UMW-4D	EPA 300.0	505276		

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### QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN SIOUX ENERGY CTR- BOTT

Pace Project No.: 60258160

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60258160004	S-UMW-4D	EPA 300.0	505661		
60258160004	S-UMW-4D	EPA 300.0	505709		
60258160005	S-UMW-5D	EPA 300.0	505276		
60258160005	S-UMW-5D	EPA 300.0	505661		
60258160006	S-UMW-6D	EPA 300.0	505276		
60258160006	S-UMW-6D	EPA 300.0	505709		
60258160007	S-BMW-1D	EPA 300.0	505276		
60258160007	S-BMW-1D	EPA 300.0	505709		
60258160008	S-BMW-3D	EPA 300.0	505276		
60258160008	S-BMW-3D	EPA 300.0	505709		
60258160009	S-UMW-DUP-1	EPA 300.0	505276		
60258160009	S-UMW-DUP-1	EPA 300.0	505661		
60258160009	S-UMW-DUP-1	EPA 300.0	505709		
60258160010	S-UMW-FB-1	EPA 300.0	505276		

### REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60258160



60258160

Client Name: Goldner

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 2.4 Corr. Factor 10.0 Corrected 4.8 2.4

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: Jami Chack \_\_\_\_\_ Date: 11/16/17

# 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 - Bottom Ash**  
 Project Number: **153-1406.0003E**

**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 WATER WASTE WATER PRODUCT SOIL/SOLID OIL	MATRIX CODE (see valid codes to left)	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>2</sub> Methanol Other	Analysis Test ↑ Metals C/F/SO <sub>4</sub> /Alkalinity TDS	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
				COMPOSITE START DATE	COMPOSITE END/ENDS DATE							
1	S-UMW-1D	WT	G	11/14/17	1423		63	3	3	N		60258160 3) BPA (3) DPA 001
2	S-UMW-2D	WT	G	11/14/17	1418		21	1	1	N		BPA 002
3	S-UMW-3D	WT	G	11/13/17	1305					N		003
4	S-UMW-4D	WT	G	11/13/17	1205					N		004
5	S-UMW-5D	WT	G	11/13/17	1415					N		005
6	S-UMW-6D	WT	G	11/13/17	1550					N		006
7	S-BMW-1D	WT	G	11/13/17	1558					N		007
8	S-BMW-3D	WT	G	11/13/17	1545					N		008
9	S-UMW-DUP-1	WT	G	11/13/17	1520					N		009
10	S-UMW-FB-1	WT	G	11/13/17	1520					N		010

**ADDITIONAL COMMENTS**  
 \*EPA 200.7: B, Ca, Mg, K, Na, Fe, Mn  
 Pace Cap / Golder  
 Relinquished by: *[Signature]* 11/14/17 1640  
 Accepted by: *[Signature]* 11/14/17 1640  
 Relinquished by: *[Signature]* 11/14/17 1700  
 Accepted by: *[Signature]* 11/14/17 1700

**SAMPLE CONDITIONS**  
 Received on Ice (Y/N): **Y**  
 Cooled Sealed (Y/N): **Y**  
 Samples Intact (Y/N): **Y**

**SAMPLER NAME AND SIGNATURE**  
 PRINT Name of SAMPLER: **Bri Warkis**  
 SIGNATURE of SAMPLER: *[Signature]*  
 DATE Signed (MM/DD/YYYY): **11/14/17**

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



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## MEMORANDUM

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**Date:** January 16, 2011  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.1

**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).
- 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 Bottom - E1  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 1/16/18

Laboratory: Pace Analytical

SDG #: 60215288

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-UMW1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D, S-UMW-DUP-1, S-UMW-FB-1, S-UMW-ID MS, S-UMW-ID MSD

**NOTE: Please provide calculation in Comment areas o**

**(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"/>	Calcium

## 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 (14.2)</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B, Ca, Mo, TDS,</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@ UMW-3D</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1@ UMW-4D</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Pb (only detect in sample), Sb (36.5)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS, pH</u>
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>TDS (26)</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 (57)</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-UMW-1D	Sulfate	80.5	D	Result had a dilution factor (DF) of 20	
S-UMW-2D	Chloride	19.5	D		2
"	Sulfate	524	D		50
S-UMW-3D	<del>Sulfate</del> <sup>SO<sub>4</sub></sup> Sulfate	833	D		100
S-UMW-4D	Chloride	25.5	D		2
"	Sulfate	511	D		50
S-UMW-5D	Chloride	24.7	D		2
"	Sulfate	41.5	D		5
S-UMW-6D	Sulfate	60.0	D		5
S-BMW-1D	Sulfate	36.5	D		5
S-UMW- <del>ES</del> <sup>GA</sup> DUP-1	Sulfate	823	D		100
"	Lead (Pb)	2.5	UJ		RPD was not met, Result < MDL

Signature: *Tommy J. Hord*

Date: 1/16/2018



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## MEMORANDUM

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**Date:** January 16, 2011  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**Project No.:** 1531406  
**Project:** Ameren  
**Email:**  
**RE: DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.2**

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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 MDL value and qualified as non-detects (U).
- Analyte of Mercury in the laboratory control sample exceeded QC limits bias high. When the results were less than the MDL the results were qualified as non-detects and estimates (UJ).
- When a field duplicate 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: Goldes Associates  
 Project Name: Ameren-Sioux-Botham-E2  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 1/16/18

Laboratory: Pace Analytical SDG #: 60219054  
 Analytical Method (type and no.): EPA 200.7, 200.8, 7470, 903.1, 904.0, 300.0; SM 2540C, 4500-H+8  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-UMW-1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D,  
S-UMW-DUP-1, S-UMW-FB-1, S-UMW-ID MS, S-UMW-ID MSD

**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"/>	
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"/>	
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 checked="" 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"/>	[Ca] 11.4 UMW-FB-1
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[Ca] UMW-FB-1 [B] 51.1 UMW-6D
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	58.9 [Cr] 0.56
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	[Sulfate] 0.39

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"/>	<del>DUP-1 @ UMW-4D</del> TG
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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	[Hg] - comments

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"/>	DUP-1 @ UMW-4D
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Se(200)
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	[TDS]
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:**

Hg % Rec in LCS exceeded % Rec Limits high.

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

SCPA  
Data Qualification: E2

Sample Name	Constituent(s)	Result	Qualifier	Reason
All Samples	Mercury (Hg)	0.039	UJ	LCS returned %Rec High, Result < MDL
S-UMW-DUP-1	Selenium (Se)	0.18	UJ	RPD exceeded limit; Result < MDL
S-UMW-FB-1	Calcium (Ca)	100	U	Detected in blank; PQL > Result > MDL
S-UMW-6D	Chromium (Cr)	1.0	U	L L
S-UMW-1D	Sulfate	61.1	D	Result had a dilution factor of 5
S-UMW-2D	Chloride	21.2		2
L	Sulfate	641		50
S-UMW-3D	Chloride	23.5		2
L	Sulfate	663		100
S-UMW-4D	Chloride	25.5		2
L	Sulfate	397		50
S-UMW-5D	Chloride	7.3		2
L	Sulfate	26.1		2
S-UMW-6D	Chloride	18.6		5
L	Sulfate	66.2		5
S-BMW-1D	Sulfate	39.9		5
S-UMW-DUP-1	Chloride	26.3		2
L	Sulfate	484		50
(16)				

Signature: Tommy J. [Signature]

Date: 4/16/2018



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## MEMORANDUM

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**Date:** January 16, 2018  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.3

**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.
- 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 MDL value and qualified as non-detects (U).
- 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: Golden Associates  
 Project Name: Ameson-Sioux Bottom E3  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 1/16/18

Laboratory: Pace Analytical

SDG #: 60223196

Analytical Method (type and no.): Metals 200.7+200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rad 903.1+904.0

Matrix:  Air  Soil/Sed.  Water  Waste

Sample Names S-UMW1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D, S-UMW-DUP-1, S-UMW-FB-1, S-UMW-ID MS, S-UMW-ID MSD

**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 ( <u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
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"/>	_____
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>Col: UMW-4D, Chloride, Sulfate</u>
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Ca: MSD % Rec High</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"/>	(22.9) Ca, Mo (0.74)
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	UMW-6D: Ca, Mo (0.85) TDS (6.0)
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	(50.3)
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"/>	<del>S-UMW-DUP-1 @ S-UMW-2D</del> T6
b) Were the proper analytes included in the LCS?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Was the LCS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S-UMW-DUP-1 @ S-UMW-2D
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	TDS
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 checked="" type="checkbox"/>	<input type="checkbox"/>	
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Ca % Rec High
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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: <sup>SCPA</sup> E3

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-BMW-1D	Molybdenum (Mo)	1.1	U	Detected in blank; PQL > Result
S-UMW-FB-1	L	0.85	L	L
L	Calcium (Ca)	50.1	L	L
S-UMW-1D	Chloride	21.2	D	Result has a dilution factor of 2
L	Sulfate	65.1		5
S-UMW-2D	Chloride	17.9		2
	Sulfate	574		50
S-UMW-3D	Chloride	24.6		2
	Sulfate	565		50
S-UMW-4D	Cadmium (Cd)	0.058	UD	2; Result < MD
	Chloride	25.5	D	2
	Sulfate	522		50
S-UMW-5D	Chloride	24.7		2
	Sulfate	40.4		5
S-UMW-6D	Chloride	21.7		2
	Sulfate	77.8		5
S-UMW-DUP-1	Chloride	19.7		2
	Sulfate	595		50
S-BMW-1D	Sulfate	41.1		5
<del>_____</del>				(Ta)

Signature: Tommy / [Signature]

Date: 7/16/2018



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## MEMORANDUM

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**Date:** April 10, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.4

**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.
- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result 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 MDL value and qualified as non-detects (U).
- When a field duplicate 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: Goldes Associates  
 Project Name: Ameren Sioux  
 Reviewer: T Goodwin Bottom EY

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 4/10/2017

Laboratory: Pace Analytical

SDG #: 60227900

Analytical Method (type and no.): \_\_\_\_\_

Matrix:  Air  Soil/Sed.  Water  Waste  \_\_\_\_\_

Sample Names Metals 200.7+200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rnd 903.1+904.0

S-UMW-1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D

S-UMW-DUP-1, S-UMW-FB-1, S-UMW-5D MS, S-UMW-5D MSD

**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 ( <del>grab</del> composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	
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"/>	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 checked="" type="checkbox"/>	<input type="checkbox"/>	Chloride, Sulfate
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ca: MS % Rec Low



## 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>Mn (1.0)</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cd, Mn @ UMW-4D</u>
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<u>(34.0) (1.2)</u>
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 @ UMW-2D</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Cd, Cr</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: MS % Rec Low</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input 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 checked="" type="checkbox"/>	<input 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-UMW-2D	Cd	<0.029	UJ	Field Dup RPD not met, Result below MDL
"	Cr	<0.34	UJ	"
S-BMW-1D	Mo	6.4	U	Detected in blank, Result below PQL
S-UMW-FB-1	"	1.2	U	"
S-UMW-DUP-1	Cd	0.061	J	Field Dup RPD not met, Result above MDL
"	Cr	0.77	J	"
S-UMW-1D	Chloride	23.2	D	Result had a Dilution Factor (DF) of 2
	Sulfate	213		20
S-UMW-2D	Chloride	19.7		2
	Sulfate	528		50
S-UMW-4D	Chloride	24.7		2
	Sulfate	624		50
S-UMW-DUP-1	Chloride	20.1		2
	Sulfate	516		50
S-UMW-3D	Chloride	22.4		2
	Sulfate	684		50
S-UMW-5D	Chloride	25.5		2
	Sulfate	38.6		5
S-UMW-6D	Chloride	20.8		2
	Sulfate	80.2		5
S-BMW-1D	"	41.6		5
<del>_____</del>				
<del>_____</del>				
<del>_____</del>				
<del>_____</del>				
<del>_____</del>				

Signature: Tommy Jordan Jr

Date: 4/10/2017



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## MEMORANDUM

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**Date:** April 18, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.5

**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.
- Boron, Calcium, Chloride, Mercury, and Sulfate exceeded the recovery criteria 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 MDL value and qualified as non-detects (U).
- When a field duplicate 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: Golden Associates  
 Project Name: Ameren Sioux - Bottom - ES  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 4/18/2017

Laboratory: Pace Analytical SDG #: 60231802  
 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-UMW-1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D, S-BMW-3D  
S-UMW-DUP-1, S-UMW-FB-1, S-UMW-4D MS, S-UMW-4DMSD

**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"/>	<u>JS/JSI</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated ( <u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB, DUP, MS/MSD</u>
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, S.G., 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 checked="" 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>MS exceeded QC limits</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>Hg, Ca, Mo, Sb, Cd,</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Bo, Ca, Mo</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>FB-1 @ <del>D12</del><sup>Tn</sup> UMW-6D</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1 @ UMW-3D</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>DUP-1: Li, Cd ; FB-1: Bo, Ca, Mo</u>
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FDS only</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>Hg, Bo, Ca, Chloride, Sulfate</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>Hg, Bo, Ca, Chloride, Sulfate</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-BMW-1D	Mo	1.2	U	Detected in blank, result is < PQL
S-BMW-3D	Mo	1.8	I	
I	Sb	0.27	I	
I	Cd	0.046	I	
I	Hg	0.046	I	
S-UMW-FB-1	Cu	89.4	U <sup>16</sup>	RPD was not met, <sup>16</sup> detected in blank below <del>MDL</del> <sup>16</sup>
I	Mo	4.5	U <sup>16</sup>	"
	<del>Bo</del>	<del>70</del>	<del>J</del>	<del>RPD was not met, result <sup>16</sup> &lt; PQL &gt; MDL</del> <sup>16</sup>
S-UMW-3D	Li	16.2	J	
S-UMW-DUP-1	Li	20.3	J	
"	Cd	0.029	UJ	RPD was not met, result < MDL
S-UMW-1D	Chloride	27.9	D	Result had a Dilution Factor (DF) of 2
"	Sulfate	194		20
S-UMW-2D	I	444		50
S-UMW-3D	I	810		50
"	Chloride	21.0		2
S-UMW-4D	Chloride	24.1		2
"	Sulfate	600		50
S-UMW-5D	Chloride	24.1		2
"	Sulfate	48.7		5
S-UMW-6D	Chloride	19.9		2
"	Sulfate	79.2		5
S-BMW-1D	I	37.7		2
S-BMW-3D	I	26.9		2
S-UMW-DUP-1	I	774		50
"	Chloride	21.2	I	2

D's

Signature: Tommy J. Good

Date: 4/18/17



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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 – SCPA – BMW-3D 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 Manager: J Ingram

Project Name: Ameren-Sioux - UMC - Bottom MUEL

Project Number: 1531406.0003 14

Reviewer: T Goodwin

Validation Date: 7/24/2017

Laboratory: Pace Analytical

SDG #: 60233958

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-3D

**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/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>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>Ba (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 checked="" 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:** April 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 – SCPA – E.6**

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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 exceeded the recovery criteria 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: Golden Associates  
 Project Name: Ameson Sioux EG UMW  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003<sup>16</sup> A  
 Validation Date: 4/24/17

Laboratory: Pace Analytical

SDG #: 60235473

Analytical Method (type and no.): Metals (200.7+200.8), Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads (903.1+704.0)

Matrix:  Air  Soil/Sed.  Water  Waste

Sample Names S-BMW-1D, S-BMW-3D

S-UMW-1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D

S-UMW-DUP-1, S-UMW-FB-1, S-UMW-IDMS, S-UMW-IDMSD

**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"/>	<u>TG + JS</u>
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated ( <u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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"/>	<u>Resolved Label Issue</u>

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 checked="" 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>Accepted on LCS</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>Hg, Ca, Pb, Cr, Sb</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Ca, Mo, Cr</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 @ UMW-2D</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1 @ UMW-5D</u>
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS only</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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Ca(142)</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(147)</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:** 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 – SCPA – BMW-3D MAKEUP 2**

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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 - Bottom - UMW M.U. E2  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 7/24/17

Laboratory: Pace Analytical SDG #: 602 3979  
 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-3D

**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>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hg(0.10), Sb(0.18)
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>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
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>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
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 (5)

<b>Blind Standards</b>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
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>	<b>YES</b>	<b>NO</b>	<b>NA</b>	<b>COMMENTS</b>
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-35	Sulfate	20.0	D	Dilution Factor of 2
I	Antimony (Sb)	1.0	U	Detected in Blank; PEL > Result
	Mercury (Hg)	0.20	U	" "
<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">7A</div>				

Signature: Tommy J. Goodwin

Date: 7/24/2017



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## MEMORANDUM

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**Date:** April 25, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER – SCPA – E.7

**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.
- Sulfate exceeded the recovery criteria for 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). If the sample results were greater than the PQL, but less than 5 times the blank detection result, the detections were recorded at the results value and qualified as non-detects (U).
- When a field duplicate 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: Goldar Associates  
 Project Name: Ameren Sioux ET UMW  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 4/25/2017

Laboratory: Pace Analytical

SDG #: 60237429

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-UMW-1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D

S-BMW-1D, S-BMW-3D

S-UMW-DUP-1, ~~S-UMW-DUP-2~~<sup>TA</sup> S-UMW-FB-1, S-UMW-ID MS, S-UMW-ID MSD

**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 ( <u>grab</u> /composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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 checked="" 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>Accepted based on LCS</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>As, Cr</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B, Ca, Cr</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 @ UMW -2D</u>
				<u>FB-1 @ UMW -6D</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Sb (25.9), Cr (114.8), Se (33), Tl (150)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS, pH</u>
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>TDS (12)</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 type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>sulfate (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-UMW-1D	Chloride	18.8	D	Sampled at a DF of 2
" "	Sulfate	51.0	D	" 5
	<del>Chromium</del>	<del>1.5</del>	<del>U<sup>TH</sup></del>	
S-UMW-2D	Sulfate	738	D	" 100
" "	Chromium	1.7	J	RPD not met, result > 5x Blank Detection
S-UMW-3D	As	1.0	U	Detected in blank, result > MDL
"	Cr	1.0	U	" "
	Chloride	21.6	D	Sampled at a DF of 2
	Sulfate	603	D	" 50
S-UMW-4D	As	<del>0.07</del> <sup>1.0</sup>	U	Detected in blank, result > MDL
	Chromium	1.0	U	" "
	Chloride	24.1	D	Sampled at a DF of 2
	Sulfate	484	D	" 50
S-UMW-5D	As	1.0	U	Detected in blank, result > MDL
	Cr	1.0	U	" "
	Chloride	26.0	D	Sampled at a DF of 2
S-UMW-6D	As	1.0	U	Detected in blank, result > MDL
	Cr	1.0	U	" "
	Chloride	19.5	D	Sampled at a DF of 2
	Sulfate	74.9	D	" 5
S-BMW-1D	As	1.0	U	Detected in blank, result > MDL
	Cr	1.2	U	" , result < 5x Blank Detection
	Sulfate	34.4	D	Sampled at a DF of 5
S-UMW-DUP-1	Cr	1.0	U	Detected in blank, result > MDL
	Se	0.086	UJ	RPD not met, result < MDL
	Tl	0.036	UJ	" "

S-UMW-FB-1  
 Signature: Tommy Berube  
 Sulfate 75.4 D Sampled at a DF of 100  
 Cr 1.0 U Detected in blank, result > MDL  
 Date: 4/25/17



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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 – SCPA – BMW-3D 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).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux Bottom - DMW M.U. E3  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003 A  
 Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60241393  
 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-3D

**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 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 (11) _____

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
<del>Sulfate</del> <sup>(16)</sup> S-BMW-3D	Sulfate	24.6	D	Dilution of 2

Signature: Tommy J. Stoddard Jr

Date: 7/24/2017



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## MEMORANDUM

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**Date:** July 5, 2017  
**To:** Project File  
**From:** Tommy Goodwin  
**cc:** Amanda Derhake, Jeff Ingram  
**RE:** DATA VALIDATION SUMMARY, SIOUX ENERGY CENTER. UMW – E.8

**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).
- 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 field duplicate 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: Goldier Associates  
 Project Name: Ameren-Sioux Bottom - E8  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 7/5/2017

Laboratory: Pace Analytical SDG #: 60246023  
 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-UMW1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D, S-BMW-2D  
S-UMW-DUP-1, S-UMW-FB-1, S-UMW-CPMS, S-UMW-LPMSD

**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"/>	<small>1001, 1002</small> <u>Be(0.49), Ca(36.1), Li(3.3); <sup>1003, 3001</sup>Be(0.38), Tl(0.043); <sup>Ehe</sup>Be(0.21), B</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Be(0.18), B(44.4), Cr(0.11),</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@ UMW-ID</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>FB-1@ UMW-SD</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Be(200), B(24.9), Li(39.1), Sb(200), Cr(107.5)</u>
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>TDS(9)</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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## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

**Data Qualification:**

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UMW-1D	Boron (B)	278	J	RPD exceeded limit; Result > MDL
	Lithium (Li)	10.7	J	"
	Antimony (Sb)	0.026	UJ	Result < MDL
	Beryllium (Be)	1.0	U	Detect in Method Blank (MB); Result < PQL
	Sulfate	36.6	D	Result had Dilution Factor (DF) of 2
S-UMW-2D	Chloride	19.1	D	2
"	Sulfate	784	D	100
S-UMW-3D	Chloride	21.5	D	2
"	Sulfate	664	D	50
S-UMW-4D	Chloride	26.6	D	2
	Sulfate	439	D	50
	Be	1.0	U	Detect in MB; Result < PQL
S-UMW-5D	Chloride	27.6	D	DF of 2
	Sulfate	40.0	D	" 5
	Chromium (Cr)	1.0	U	Detect in Field Blank; Result < PQL
S-UMW-6D	Be	1.0	U	MB
	Th	1.0	U	"
	Chloride	19.5	D	DF of 2
	Sulfate	31.8	D	" 5
S-BMW-1D	Sulfate	36.1	D	5
	Be	1.0	U	Detect in MB; Result < PQL
	Li	13.0	U	Result < <del>MDL</del> <sup>10x</sup> Blank Detection
S-BMW-3D	Li	22.0	U	"
	Be	1.0	U	Result < PQL
	Sulfate	26.1	D	DF of 2
S-UMW-FB-1	Be	1.0	U	Detect in MB; Result < PQL

S-UMW-DUP-1

B 35.7  
Sulfate 37.1  
Signature: *Tracy Johnson*

RPD exceeded limit; Result > MDL  
DF of 2

Date: 7/5/17



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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 – SCPA – BMW-3D 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: Golder Associates Project Manager: J Ingram  
 Project Name: Ameren-Sioux - Bottom - UMW M.U. E4 Project Number: 1531406.0003A  
 Reviewer: T Goodwin Validation Date: 7/24/2017

Laboratory: Pace Analytical SDG #: 60247465  
 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-3D

**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"/>	Be(0.31), Cr(0.087)
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"/>	TDS(4)

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-BMW-3D	Sulfate	26.4	D	Dilution of 2
"	Chromium (Cr)	1.0	U	Detected in Method Blank; PAL > Result
(12)				

Signature: *Tommy J. [Signature]*

Date: 7/24/2017



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## MEMORANDUM

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**Date:** December 22, 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 – SCPA – D.M. NOV. 2017**

---

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).
- 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 result value and qualified as non-detects (U).

## QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates  
 Project Name: Ameren-Sioux-UMW-D.M. Nov 2017  
 Reviewer: T Goodwin

Project Manager: J Ingram  
 Project Number: 1531406.0003A  
 Validation Date: 12/22/17

Laboratory: Pace Analytical SDG #: 602 58160  
 Analytical Method (type and no.): Metals 200.7 & 200.8, Hg 7470, TDS 2540C, pH 4500H+, Anions 300.0, Rads 9031 & 9040, SM 2320 E  
 Matrix:  Air  Soil/Sed.  Water  Waste   
 Sample Names S-UMW1D, S-UMW-2D, S-UMW-3D, S-UMW-4D, S-UMW-5D, S-UMW-6D, S-BMW-1D, S-BMW-3D  
S-UMW-DUP-1, S-UMW-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"/>	
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 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 (93.1), Mg (18.0), Na (81.9)</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>B (98.1), Ca (39.4), Na (41.2), Sulfate (0.65)</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-UMW-2D</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1@ S-UMW-6D</u>
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Aik, TDS</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 checked="" 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

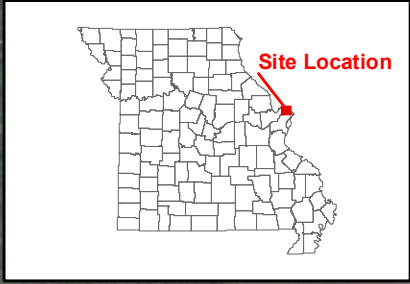
Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
S-UMW-1D	Boron (B)	266	U	Detected in Method Blank (MB); $10 \times MB > Result > PQL$
┆	Chloride	18.7	D	Result had a dilution factor (DF) of 2
	Sulfate	49.1	┆	5
S-UMW-2D	Chloride	19.3	┆	2
┆	Sulfate	722	┆	50
S-UMW-3D	Chloride	20.4	┆	2
┆	Sulfate	710	┆	50
S-UMW-4D	Chloride	25.4	┆	2
┆	Sulfate	544	┆	50
S-UMW-5D	Chloride	25.8	┆	2
S-UMW-6D	Sulfate	86.4	┆	10
S-BMW-1D	Sulfate	37.6	┆	2
┆	B	241	U	MB; $10 \times MB > Result > PQL$
S-BMW-3D	B	109	U	┆ ┆
┆	Sulfate	27.5	D	DF of 2
S-UMW-DUP-1	Chloride	19.4	┆	┆ 2
┆	Sulfate	720	┆	┆ 50
S-UMW-FB-1	B	100	U	MB; $PQL > Result > MDL$
┆	Sodium (Na)	500	U	┆ ┆
┆	Calcium (Ca)	39.4	J	$PQL > Result > MDL$
┆	Sulfate	0.65	J	┆
(TJK)				

Signature: Tommy J. Marshall

Date: 12/22/2017

# **APPENDIX C – POTENTIOMETRIC SURFACE MAPS**



bing

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**LEGEND**

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Groundwater Elevation Piezometer
- Background Monitoring Well
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- SCPA Bottom Ash Surface Impoundment Gauge
- River Gauge Location
- Groundwater Flow Direction

**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
- 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

**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).

0 250 500 1,000 1,500 2,000 Feet

**CLIENT**  
**AMEREN MISSOURI**  
**SIOUX ENERGY CENTER**

**PROJECT**  
**CCR GROUNDWATER MONITORING PROGRAM**

**TITLE**  
**SCPA POTENTIOMETRIC SURFACE MAP**  
**BACKGROUND EVENT 1 - MARCH 16, 2016**

**CONSULTANT**

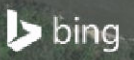
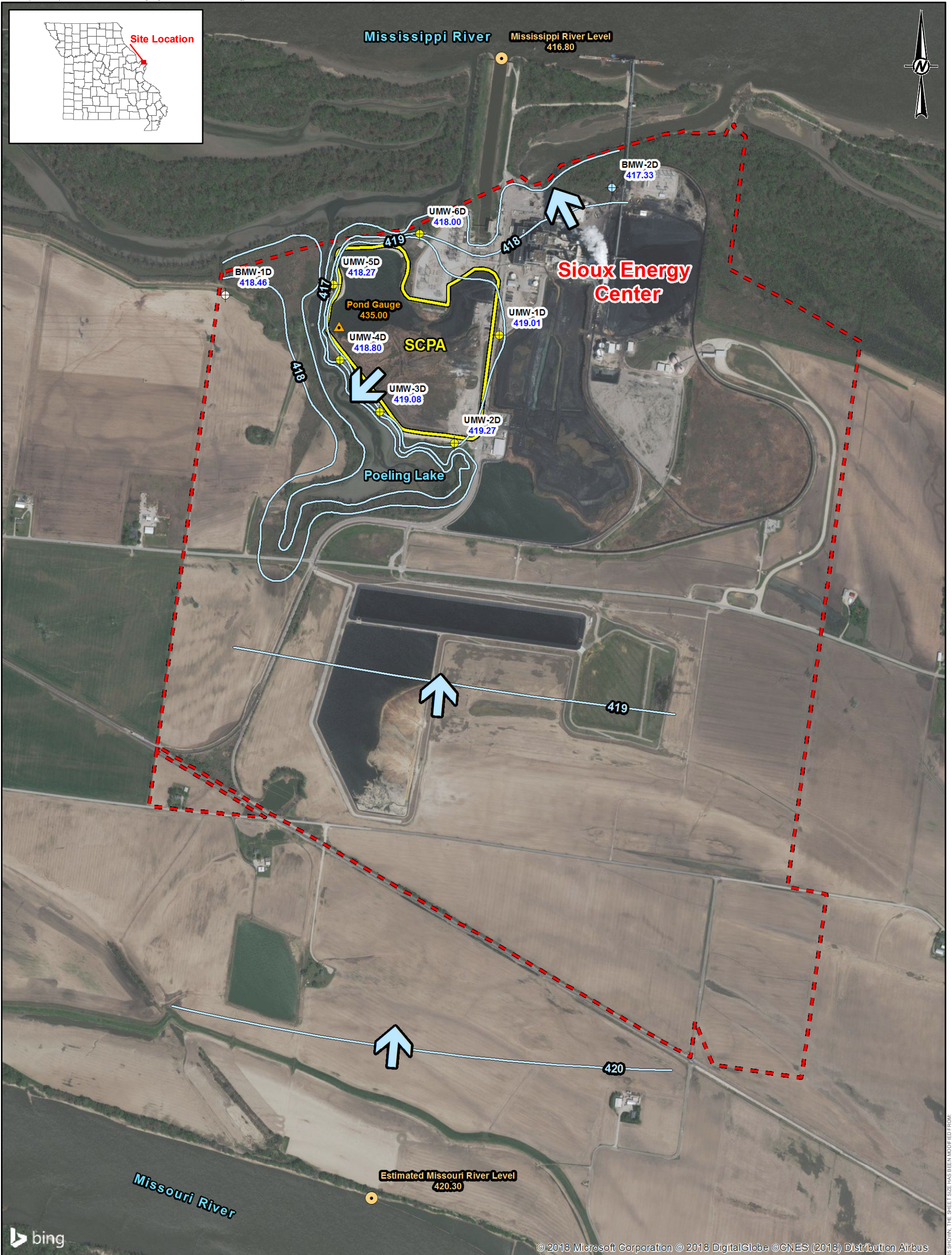
CLIENT	AMEREN MISSOURI	DATE	2016-03-30
PROJECT	SIOUX ENERGY CENTER	PREPARED BY	JSI
	CCR GROUNDWATER MONITORING PROGRAM	DESIGN BY	JSI
		REVIEW BY	JS
		APPROVED BY	MNH

PROJECT No. 153-1406      PHASE 0003A

FIGURE P1

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



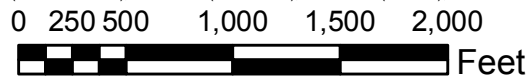


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- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPA - Bottom Ash Surface Impoundment
  - Groundwater Elevation Contour (FT MSL)**
  - Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Elevation Contour (FT MSL)
  - Ground/Surface Water Measurement Locations**
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPA Bottom Ash Surface Impoundment Monitoring Well
  - SCPA Bottom Ash Surface Impoundment Gauge
  - River Gauge Location
  - Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
  - 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
  - 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
  - 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
  - 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
  - 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

- 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).



**CLIENT**  
**AMEREN MISSOURI**  
**SIOUX ENERGY CENTER**

**PROJECT**  
**CCR GROUNDWATER MONITORING PROGRAM**



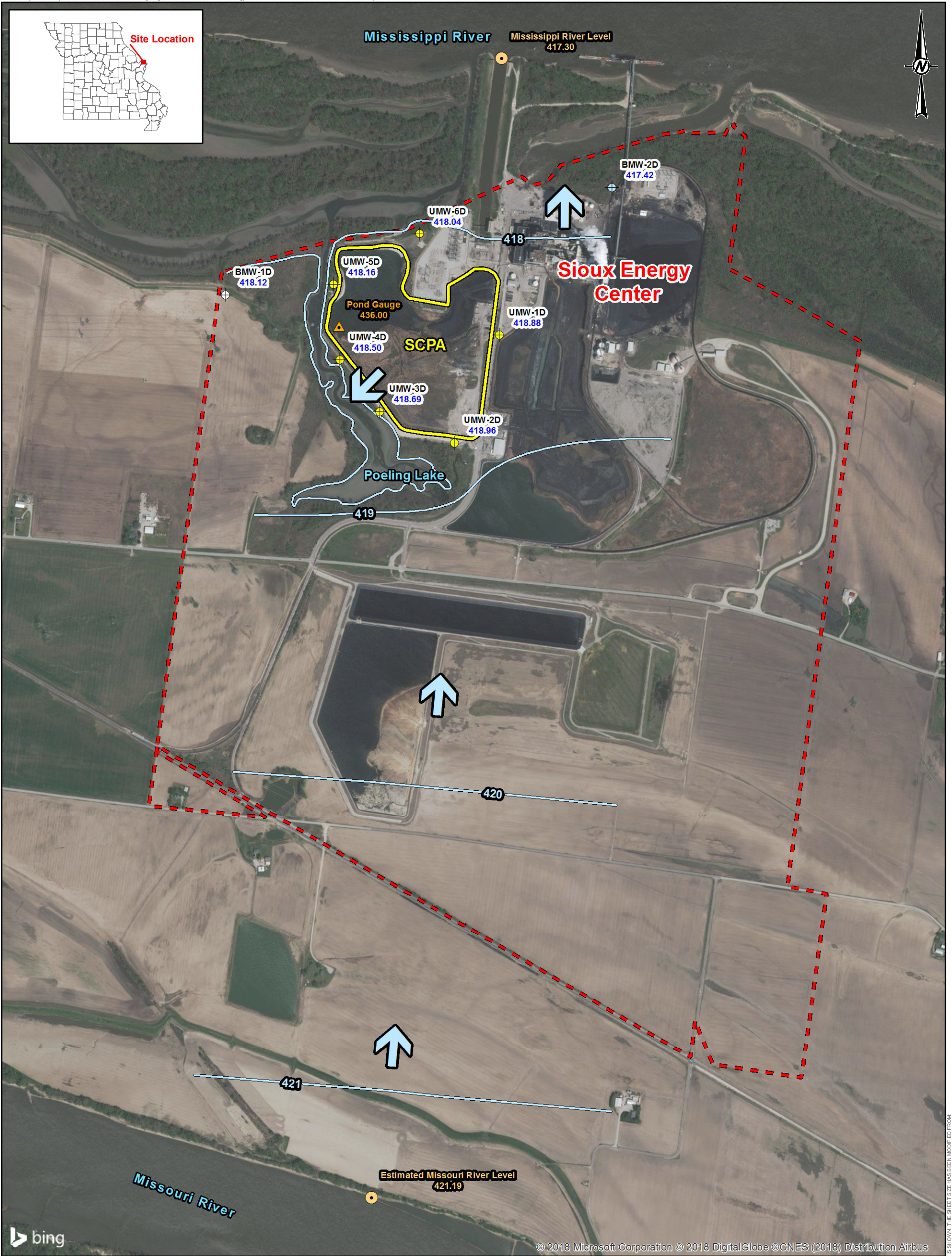
**TITLE**  
**SCPA POTENTIOMETRIC SURFACE MAP**  
**BACKGROUND EVENT 2 - MAY 9, 2016**

CONSULTANT		DATE
		YYYY-MM-DD
		2016-05-25
		PREPARED
		JS
		DESIGN
JS		
REVIEW		
JSI		
APPROVED		
MNH		

PROJECT No. 153-1406      PHASE 0003A

FIGURE P2

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



**LEGEND**

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Groundwater Elevation Piezometer
- Background Monitoring Well
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- SCPA Bottom Ash Surface Impoundment Gauge
- River Gauge Location
- Groundwater Flow Direction

**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
- 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
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- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

**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).

0 250 500 1,000 1,500 2,000  
 Feet

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

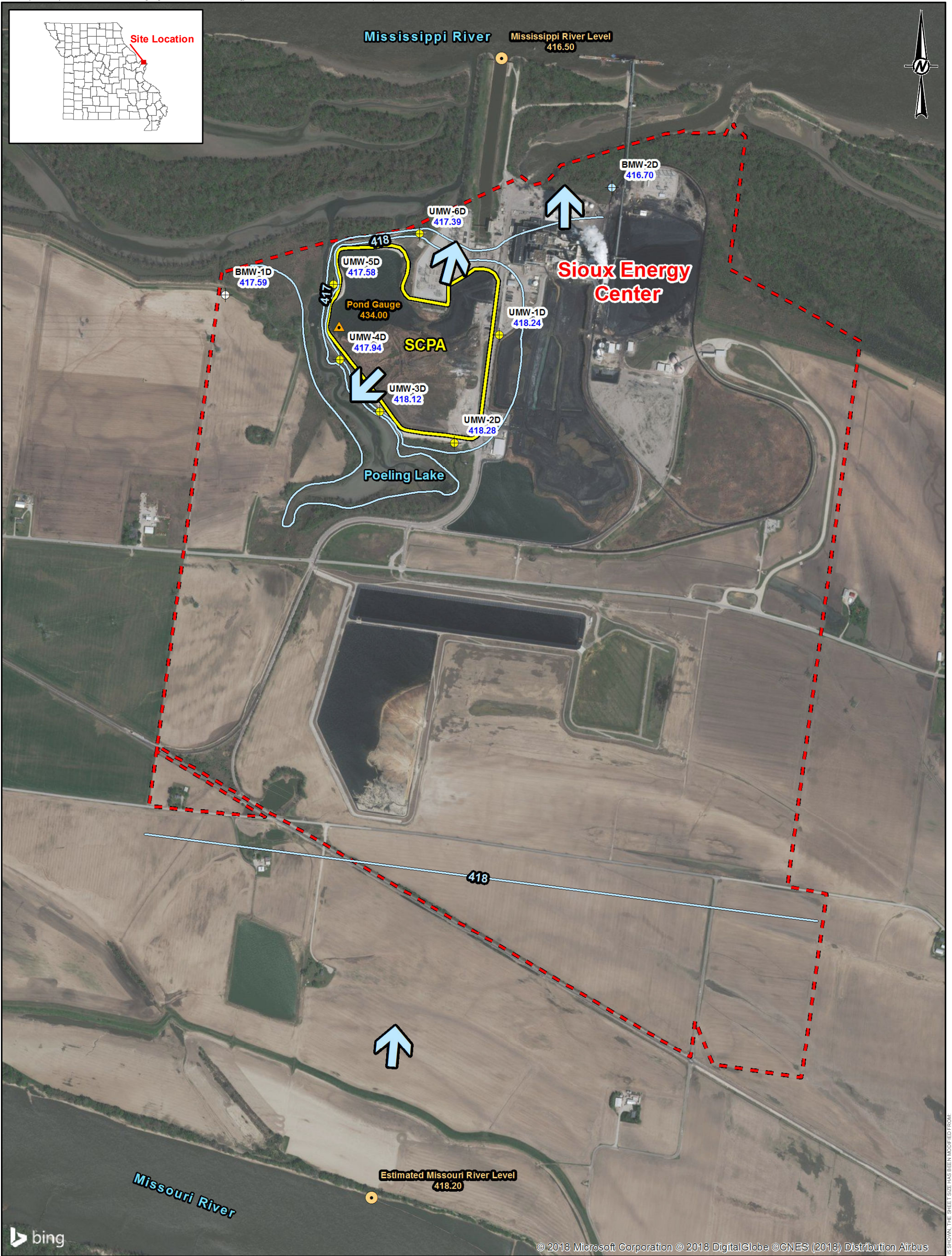
**TITLE**  
 SCPA POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 3 - JULY 5, 2016

**CONSULTANT**

CLIENT	AMEREN MISSOURI	2016-08-16
PROJECT	SIOUX ENERGY CENTER	2016-08-16
TITLE	CCR GROUNDWATER MONITORING PROGRAM	2016-08-16
CONSULTANT	GOLDER ASSOCIATES	2016-08-16
DATE	2016-08-16	2016-08-16
PREPARED	JS	2016-08-16
DESIGN	JS	2016-08-16
REVIEW	JSI	2016-08-16
APPROVED	MNH	2016-08-16

PROJECT No. 153-1406      PHASE 0003A      FIGURE P3

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



**LEGEND**

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Groundwater Elevation Piezometer
- Background Monitoring Well
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- SCPA Bottom Ash Surface Impoundment Gauge
- River Gauge Location
- Groundwater Flow Direction

**NOTES**

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- 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
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- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

**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).

0 250 500 1,000 1,500 2,000  
 Feet

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

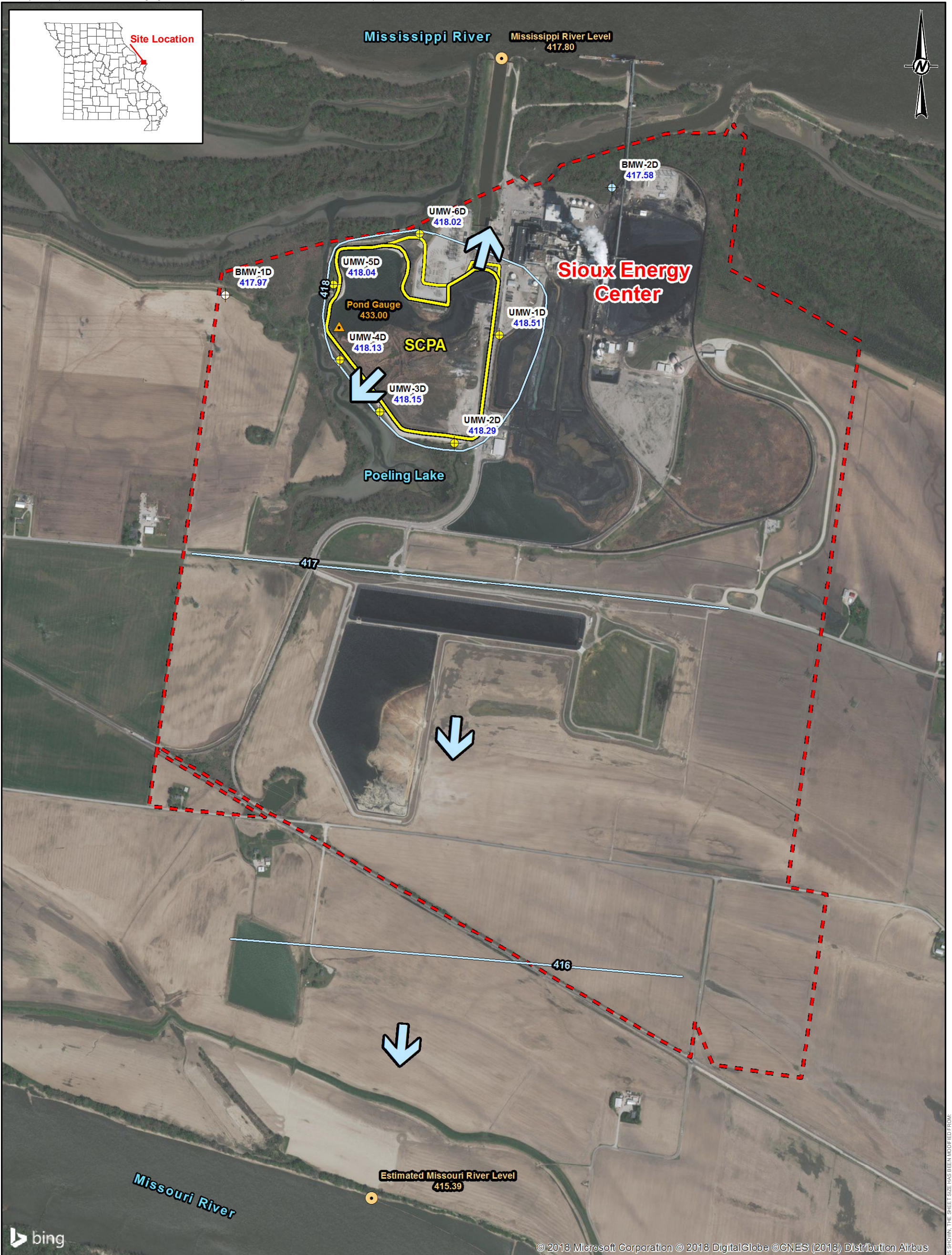
**TITLE**  
 SCPA POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 4 - SEPTEMBER 14, 2016

**CONSULTANT**

CLIENT	AMEREN MISSOURI	2016-09-27
PROJECT	SIOUX ENERGY CENTER	2016-09-27
TITLE	CCR GROUNDWATER MONITORING PROGRAM	2016-09-27
CONSULTANT	GOLDER ASSOCIATES	2016-09-27
PREPARED	JSI	2016-09-27
DESIGN	JSI	2016-09-27
REVIEW	JS	2016-09-27
APPROVED	MNH	2016-09-27

PROJECT No. 153-1406      PHASE 0003A      FIGURE P4

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



**LEGEND**

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
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- Groundwater Elevation Contour (FT MSL)
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**NOTES**

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- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
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**REFERENCE**

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0 250 500 1,000 1,500 2,000  
 Feet

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCPA POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 5 - NOVEMBER 7, 2016

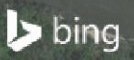
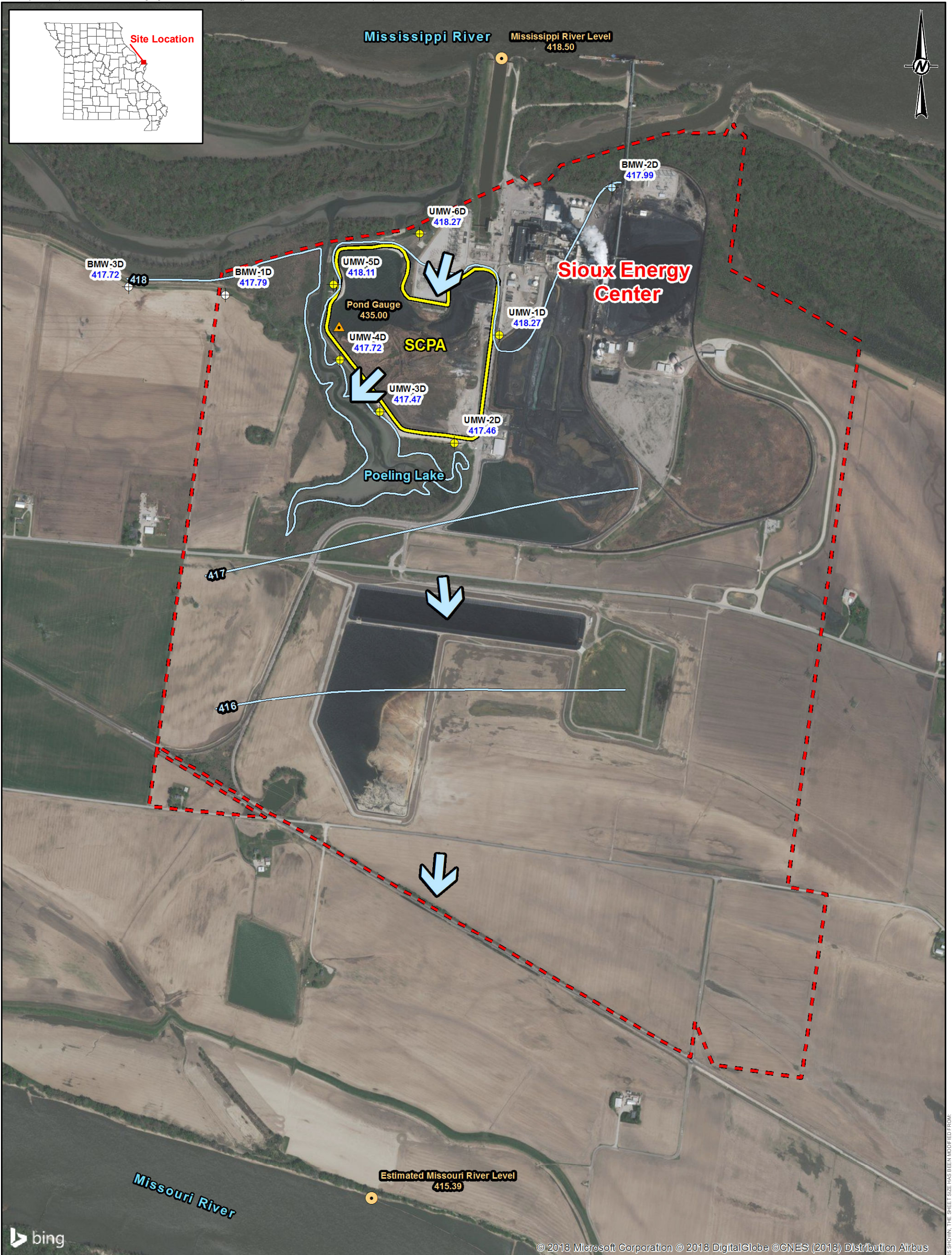
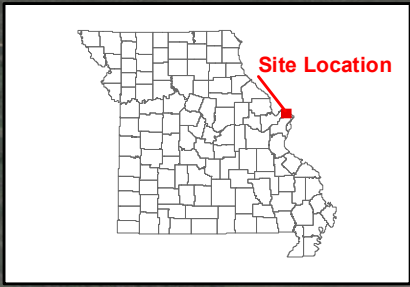
**CONSULTANT**

CLIENT	AMEREN MISSOURI	SIoux ENERGY CENTER
PROJECT	CCR GROUNDWATER MONITORING PROGRAM	
TITLE	SCPA POTENTIOMETRIC SURFACE MAP	BACKGROUND EVENT 5 - NOVEMBER 7, 2016
CONSULTANT	GOLDER ASSOCIATES	
DATE	2017-11-15	
PREPARED BY	JSI	
DESIGNED BY	JSI	
REVIEWED BY	MSG	
APPROVED BY	MNH	

PROJECT No. 153-1406      PHASE 0003A

FIGURE P5

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



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- LEGEND**
- Sioux Energy Center Property Boundary
  - SCPA - Bottom Ash Surface Impoundment
  - Groundwater Elevation Contour (FT MSL)**
  - Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Elevation Contour (FT MSL)
  - Ground/Surface Water Measurement Locations**
  - Groundwater Elevation Piezometer
  - Background Monitoring Well
  - SCPA Bottom Ash Surface Impoundment Monitoring Well
  - SCPA Bottom Ash Surface Impoundment Gauge
  - River Gauge Location
  - Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
  - 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
  - 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
  - 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
  - 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
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- 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).



CLIENT  
**AMEREN MISSOURI**  
 SIOUX ENERGY CENTER

PROJECT  
 CCR GROUNDWATER MONITORING PROGRAM



TITLE  
**SCPA POTENTIOMETRIC SURFACE MAP**  
**BACKGROUND EVENT 6 - JANUARY 3, 2017**

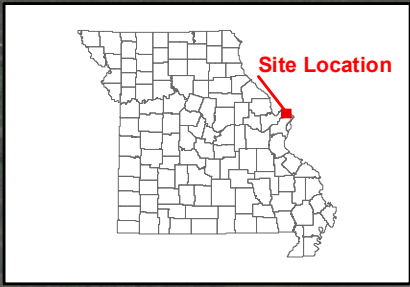
CONSULTANT	DATE	BY
	YYYY-MM-DD	2017-01-23
	PREPARED	JS
	DESIGN	JSI
	REVIEW	BEF
	APPROVED	MNH

PROJECT No.  
153-1406

PHASE  
0003A

FIGURE  
**P6**

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



**LEGEND**

- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Background Monitoring Well
- SCPA Bottom Ash Surface Impoundment Gauge
- Groundwater Elevation Piezometer
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- River Gauge Location
- Groundwater Flow Direction

**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
- 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.

**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).

0 250 500 1,000 1,500 2,000  
 Feet

**CLIENT**  
 AMEREN MISSOURI  
 SIOUX ENERGY CENTER

**PROJECT**  
 CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
 SCPA POTENTIOMETRIC SURFACE MAP  
 BACKGROUND EVENT 7 - MARCH 8, 2017

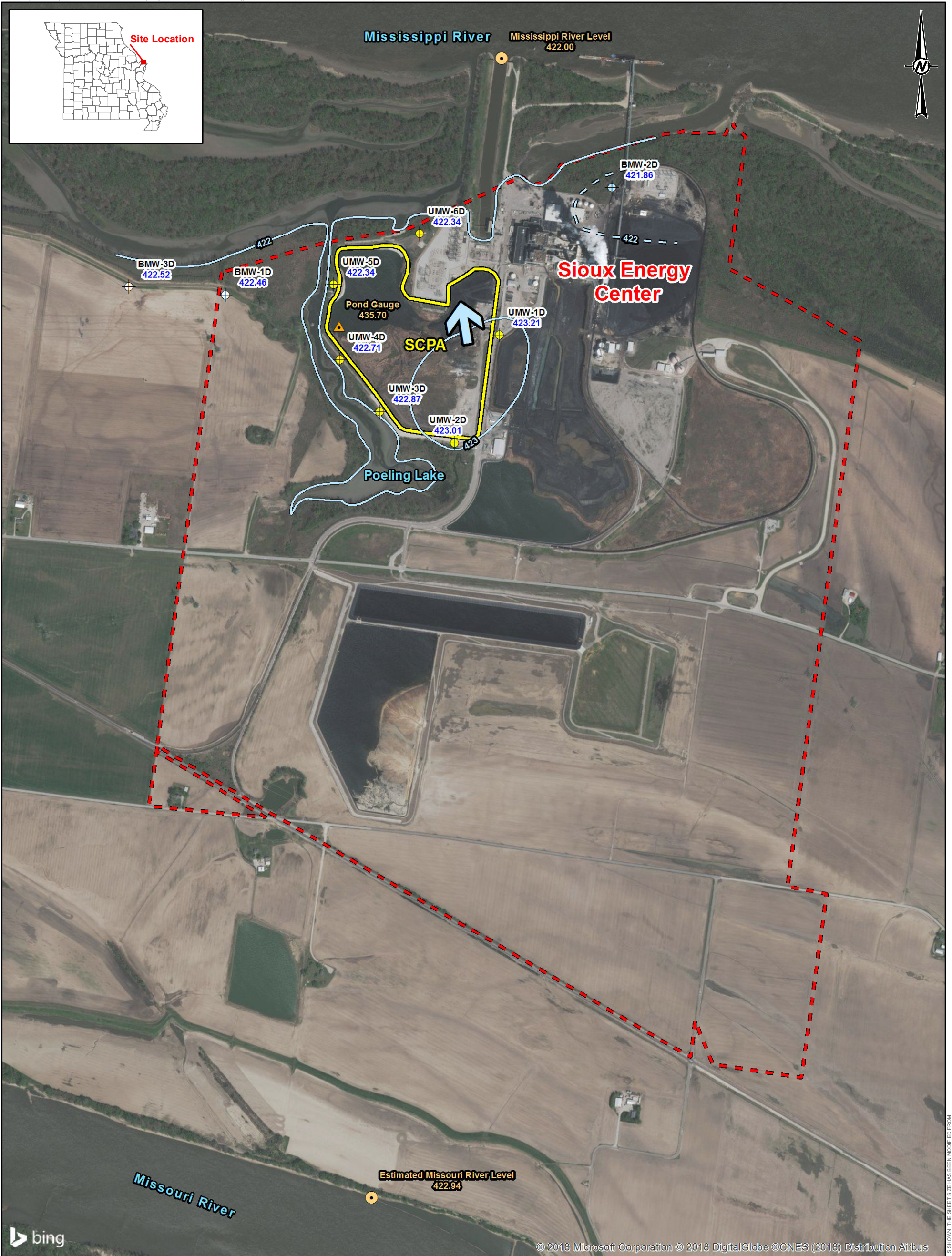
**CONSULTANT**

CLIENT	AMEREN MISSOURI	SIoux ENERGY CENTER
PROJECT	CCR GROUNDWATER MONITORING PROGRAM	
TITLE	SCPA 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 0003A

FIGURE P7

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



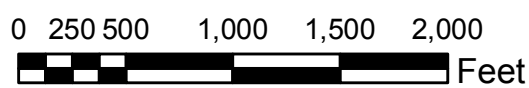
bing

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- LEGEND**
- - - Sioux Energy Center Property Boundary
  - SCPA - Bottom Ash Surface Impoundment
  - Groundwater Elevation Contour (FT MSL)**
  - = = Inferred Groundwater Elevation Contour (FT MSL)
  - Groundwater Elevation Contour (FT MSL)
  - Ground/Surface Water Measurement Locations**
  - ⊕ Groundwater Elevation Piezometer
  - ⊕ Background Monitoring Well
  - ⊕ SCPA Bottom Ash Surface Impoundment Monitoring Well
  - ▲ SCPA Bottom Ash Surface Impoundment Gauge
  - River Gauge Location
  - ↷ Groundwater Flow Direction

- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
  - 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
  - 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
  - 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
  - 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
  - 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
  - 7.) POND GAUGE LEVEL OBTAINED ONSITE BY GOLDER.
- 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).

- CLIENT**  
**AMEREN MISSOURI**  
**SIOUX ENERGY CENTER**
- PROJECT**  
**CCR GROUNDWATER MONITORING PROGRAM**
- TITLE**  
**SCPA POTENTIOMETRIC SURFACE MAP**  
**BACKGROUND EVENT 8 - JUNE 5, 2017**
- CONSULTANT**



YYYY-MM-DD	2017-06-23
PREPARED	JSI
DESIGN	JSI
REVIEW	RJF
APPROVED	MNH

PROJECT No. 153-1406      PHASE 0003A      FIGURE P8

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



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**LEGEND**

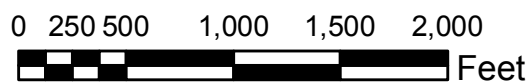
- Sioux Energy Center Property Boundary
- SCPA - Bottom Ash Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Background Monitoring Well
- Groundwater Elevation Piezometer
- SCPA Bottom Ash Surface Impoundment Monitoring Well
- River Gauge Location
- Groundwater Flow Direction

**NOTES**

- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
- 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON JANUARY 14 AND DECEMBER 8, 2016.
- 3.) GROUNDWATER AND SURFACE WATER ELEVATIONS DISPLAYED IN FEET ABOVE MEAN SEA LEVEL (FT MSL).
- 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
- 5.) MISSOURI RIVER ELEVATION ESTIMATED BASED ON NEARBY UNITED STATES GEOLOGICAL SURVEY (USGS) RIVER GAUGING LOCATIONS.
- 6.) MISSISSIPPI RIVER ELEVATION PROVIDED BY AMEREN MISSOURI.
- 7.) POND WATER LEVEL WAS BELOW POND GAUGE.

**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).



**CLIENT**  
AMEREN MISSOURI  
SIOUX ENERGY CENTER

**PROJECT**  
CCR GROUNDWATER MONITORING PROGRAM

**TITLE**  
SCPA POTENTIOMETRIC SURFACE MAP  
DETECTION MONITORING - NOVEMBER 13, 2017

**CONSULTANT**  
 Golder Associates

DATE	2017-11-22
PREPARED	RJF
DESIGN	JSI
REVIEW	JS
APPROVED	MNH

**PROJECT No.** 153-1406      **PHASE** 0003A

**FIGURE P9**

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



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South America	+ 56 2 2616 2000

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