



2018 Annual Groundwater Monitoring and Corrective Action Report

RCPA Surface Impoundment, Rush Island Energy Center, Jefferson County, Missouri, USA

Submitted to:

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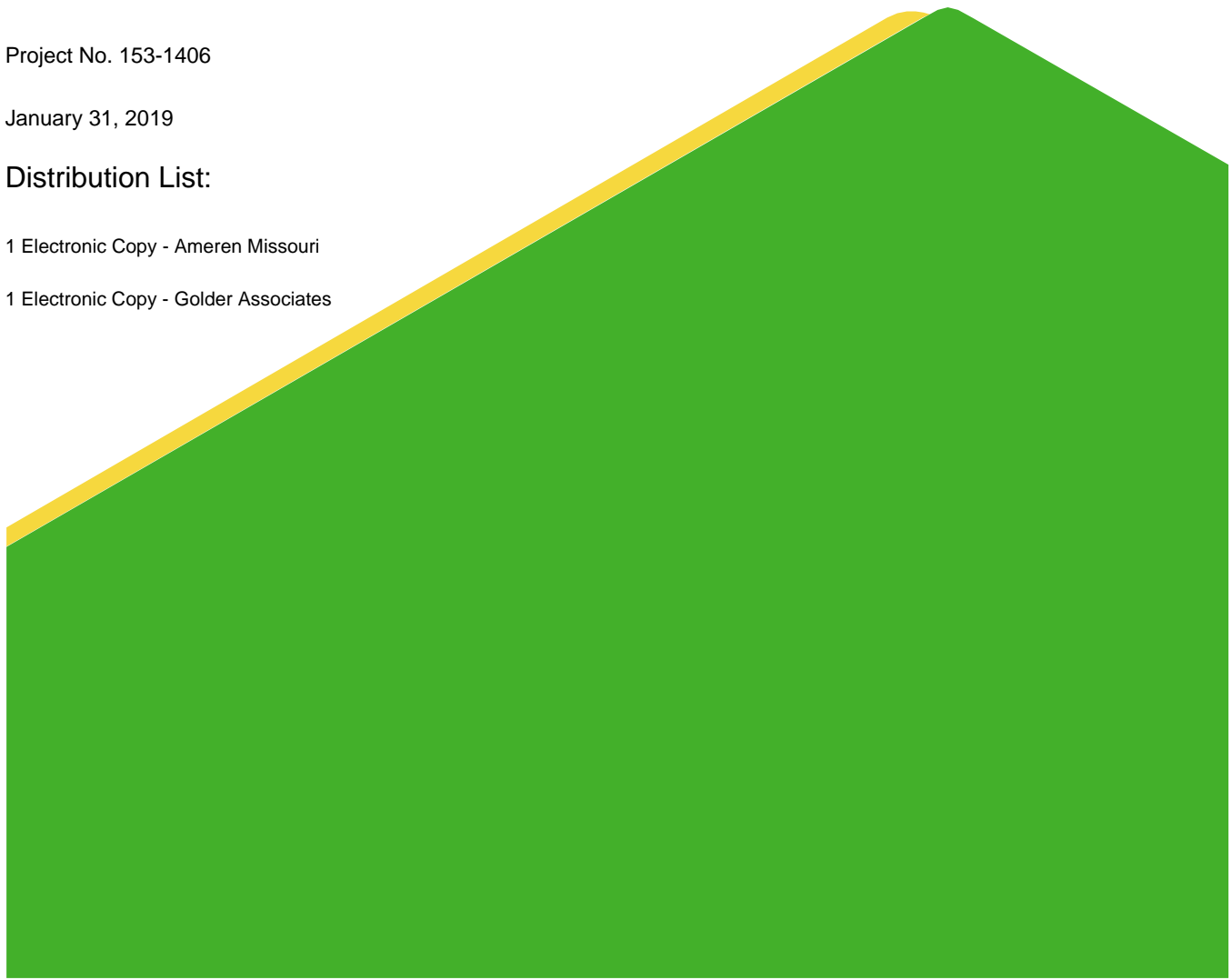


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1.0 INTRODUCTION

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 RCPA Coal Combustion Residuals (CCR) Surface Impoundment at the Rush Island Energy Center (RIEC) is subject to the requirements of the CCR Rule. This Annual Report for the RCPA describes CCR Rule groundwater monitoring activities from January 1, 2018 through December 31, 2018.

2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the RCPA. The groundwater monitoring system consists of nine (9) monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2018 as a part of the CCR Rule monitoring program for the RCPA. For more information on the groundwater monitoring network, see the 2017 Annual Groundwater Monitoring Report for the RCPA.

As a part of the Nature and Extent Investigation begun in 2018, several existing monitoring wells were sampled. A summary of the construction details of these wells and the RCPA groundwater monitoring system wells is provided in **Table 1** and their locations are provided in **Figure 1**.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the RCPA CCR Unit in 2018. **Table 2** provides a summary including the date of sample collection and the monitoring program.

3.1 Detection Monitoring Program

The first Detection Monitoring event was completed November 9-10, 2017. Verification Sampling and the Statistical Analysis to evaluate for Statistically Significant Increases (SSI) for the November 2017 event were not completed until 2018 and are included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 10, 2018 and verified SSIs. A table summarizing the results of the statistical analysis of the November 2017 Detection Monitoring event is provided in **Table 3** and laboratory analytical data are provided in **Appendix A**. The results of this analysis indicated SSIs and a notification of the establishment of an Assessment Monitoring Program was placed in the operating record and on the publicly available website.

A Detection Monitoring event was completed May 24-25, 2018, and testing was completed for all Appendix III analytes. Statistical analysis of these data determined that there were SSIs. A table summarizing the results of the statistical analysis of the May 2018 Detection Monitoring event is provided in **Table 4** and laboratory analytical data are provided in **Appendix A**.

A Detection Monitoring event was completed November 1-6, 2018 and testing was performed for all Appendix III analytes. Statistical analyses to evaluate for SSIs in the November 2018 data were not completed in 2018. Results of the statistical evaluation for the November 2018 data will be included in the 2019 annual report. A table summarizing the results of the November 2018 Detection Monitoring event is provided in **Table 5** and laboratory analytical data are provided in **Appendix A**.

3.2 Assessment Monitoring Program

After the determination of a verified SSI, an Assessment Monitoring Program was established for the RCPA. The April 2018 Assessment Monitoring event was completed April 2-3, 2018 and testing was completed for all Appendix IV parameters. A summary of the results is provided in **Table 6** and laboratory analytical data are provided in **Appendix A**. Based on the results from the initial analysis, the May 2018 Assessment Monitoring event was completed to analyze the Appendix IV constituents detected in groundwater during the initial assessment monitoring sampling event. This sampling was completed on May 24-25, 2018. A summary of the results is provided in **Table 7** and laboratory analytical data are provided in **Appendix A**.

Using the data collected in these two sampling events along with data collected during baseline sampling, a statistical analysis was completed to identify parameters at a Statistically Significant Level (SSL) over the RCPA Groundwater Protection Standards (GWPS). The results from this analysis and a table that displays the site-specific GWPS are provided in **Appendix B**. Results from this evaluation indicated SSLs and a notification of the detection of the SSLs above RCPA GWPS was placed in the operating record and on the publicly available website. A summary of SSLs and their well locations are as follows:

- Arsenic at MW-2, MW-3, and MW-7
- Molybdenum at MW-2, MW-3, and MW-7

On November 1-6, 2018, the November 2018 Assessment Monitoring sampling event was completed. This sampling event analyzed the Appendix IV constituents detected in groundwater during the initial assessment monitoring sampling event (the same parameters as the May 2018 sampling event). A summary of the results is provided in **Table 8**, however statistical analyses to evaluate for SSLs over GWPS were not completed in 2018. Results of the statistical evaluation will be included in the 2019 annual report.

3.2.1 Nature and Extent Evaluation

As required by the CCR Rule, after an SSL is determined to be above site GWPS, an investigation into the nature and extent of impacts that may affect the remedy selection must be initiated. This investigation began in 2018, however, data validation, evaluation, and statistical analysis of this data were not completed in 2018. A characterization of the nature and extent of the groundwater impacts and evaluation of site conditions that may affect the assessment and selection of corrective measures is underway. Nature and extent data and results will be provided in 2019.

3.3 Assessment of Corrective Measures

Since an SSL was determined above the RCPA GWPS, a notification that an Assessment of Corrective Measures has been initiated was posted to the operating record and to the publicly available website. An Assessment of Corrective Measures will be completed in 2019 and will be posted as required by the CCR Rule.

3.4 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 influenced by seasonal changes in water level of the adjacent Mississippi River. Water flows into and out of the

alluvial aquifer as a result of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. Overall, based on the potentiometric surface maps, a general flow direction from the west (bluffs area) to the east (Mississippi River) is observed under normal river conditions. However, during periods of high river levels, groundwater flow can temporarily reverse. During these times of high river stage and temporary flow direction changes, horizontal groundwater gradients generally decrease, and little net movement of groundwater occurs.

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, the overall net groundwater flow at the RCPA is from the bluffs towards the river. Horizontal gradients calculated by the program range from 0.0001 to 0.0015 feet/foot with an estimated net annual groundwater velocity of approximately 34 feet per year.

4.0 STATUS OF THE GROUNDWATER MONITORING PROGRAM

As required by the CCR Rule, in 2018 Ameren posted a notification of Assessment Monitoring and notification of constituents exceeding CCR Groundwater Protection Standards for the RCPA. Currently, the RCPA CCR Unit is in Assessment Monitoring and has begun an Assessment of Corrective Measures. Detection and Assessment Monitoring will continue as required by the CCR Rule.

4.1 Sampling Issues

No notable sampling issues were encountered at the RIEC in 2018.

5.0 ACTIVITIES PLANNED FOR 2019

Detection and Assessment Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2019. Statistical analysis of the November 2018 Detection and Assessment Monitoring data will be completed in 2019 and included in the 2019 Annual Report.

As required by the Assessment Monitoring Program, a characterization of the nature and extent of impacts began in 2018 and will continue in 2019. Additionally, an Assessment of Corrective Measures will be performed in 2019. After this assessment is completed and as soon as feasible, a corrective measure will be selected. A semiannual report describing the progress in selecting and designing the corrective measure will be completed and posted to the website as required by the CCR Rule.

Tables

Table 1
Summary of Well Construction Details
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

Monitoring Well ID	Installation Date	Location		Top of Casing Elevation	Ground Surface Elevation	Top of Screen Elevation	Base of Well	Total Depth
		Northing ¹	Easting ¹	(FT MSL) ²	(FT MSL) ²	(FT MSL) ²	(FT MSL) ²	(FT BGS) ³
CCR RULE MONITORING WELLS								
R-MW-1	10/31/2015	835384.2	889832.5	395.52	393.5	320.7	310.5	83.0
R-MW-2	11/1/2015	834261.5	890364.1	393.87	391.7	319.5	309.3	82.4
R-MW-3	10/31/2015	833178.4	890892.7	391.38	389.2	319.1	308.9	80.3
R-MW-4	10/30/2015	831647.5	890830.5	392.78	390.8	310.9	300.7	90.1
R-MW-5	10/29/2015	831994.9	889984.5	390.36	388.0	333.0	327.8	60.2
R-MW-6	10/28/2015	833111.0	888977.0	402.71	401.1	346.4	341.2	59.8
R-MW-7	10/28/2015	834476.8	888483.3	407.95	406.1	318.1	307.9	98.2
R-MW-B1	10/28/2015	837602.1	887903.9	411.61	409.6	319.8	309.6	100.0
R-MW-B2	10/27/2015	837801.7	885337.2	397.85	395.9	318.3	308.1	87.9
NATURE AND EXTENT MONITORING WELLS								
P01S	12/3/2012	831422.3	890858.9	387.62	385.7	368.7	348.7	37.0
P03D	12/11/2013	831686.3	890369.8	391.65	389.3	320.2	315.2	69.1
P03S	11/30/2012	831690.9	890352.1	391.68	389.5	360.5	340.5	29.0
P05I	12/11/2013	832295.4	889756.1	390.07	387.9	331.8	326.8	56.1
P05S	12/5/2012	832317.6	889749.7	392.50	390.1	365.6	345.6	24.5
P08D	12/11/2013	833687.5	888715.1	404.61	401.8	331.8	326.8	75.0
P08S	11/30/2012	833692.6	888711.1	404.79	402.0	362.0	342.0	60.0
P10S	12/4/2012	834545.1	888099.0	407.23	404.8	375.8	355.8	49.0
P13D	12/6/2013	834992.6	889105.8	410.40	408.5	270.5	265.5	143.0
P13I	12/7/2013	834995.2	889110.6	410.52	408.6	332.6	327.6	81.0
P13S	12/11/2012	835005.5	889108.3	411.62	409.3	372.3	352.3	57.0
P17D	9/6/2013	834718.8	890158.3	395.56	392.6	267.3	262.3	130.3
P17I	12/10/2013	834744.2	890148.9	394.86	392.5	333.6	328.6	63.9
P17S	11/27/2012	834736.7	890152.8	394.65	392.5	375.5	355.5	37.0
P19D	12/10/2013	833915.6	890552.2	392.08	390.3	270.3	265.3	125.0
P19I	12/10/2013	833911.3	890550.6	392.75	390.2	330.7	325.7	64.5
P19S	11/27/2012	833919.0	890546.4	393.31	390.6	368.6	348.6	42.0
P21D	12/9/2013	832902.9	891031.2	393.39	391.0	271.8	266.8	124.2
P21I	12/9/2013	832904.2	891027.0	393.53	391.2	333.4	328.4	62.8
P21S	11/28/2012	832898.0	891024.7	393.87	391.5	371.5	351.5	40.0
P22D	12/7/2013	832278.2	891018.7	393.76	391.6	286.6	281.6	110.0
P22I	12/8/2013	832272.1	891018.0	393.52	391.6	332.6	327.6	64.0
P22S	11/29/2012	832277.0	891007.6	394.30	392.2	373.2	353.2	39.0
P27S	12/13/2012	834319.5	888680.9	413.23	410.3	381.3	371.3	39.0
P28S	12/12/2012	834788.3	889594.3	413.34	410.9	380.9	370.9	40.0
P29D	12/11/2013	837804.9	885389.1	398.27	396.2	300.9	295.9	100.3
P29S	1/17/2013	837797.9	885383.8	399.11	397.0	367.0	347.0	50.0
P30S	1/16/2013	836606.9	889007.8	407.75	408.0	368.0	348.0	60.0
P31S	12/10/2012	835629.4	887488.1	408.68	406.1	374.1	354.1	52.0

Notes:

- 1) Horizontal Datum: State Plane Coordinates NAD83 (2000) Missouri East Zone feet. Checked by: JAP
- 2) FT MSL- feet above mean sea level. Reviewed by: MNH
- 3) FT BGS - feet below ground surface
- 4) Vertical Datum: NAVD88 feet.

Prepared by: RJF

Table 2
Summary of Groundwater Sampling Dates
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

Groundwater Monitoring Wells	Date of Sample Collection						
	January 2018 - Verification Sampling	April 2018 - Assessment Monitoring Sampling	May 2018 - Assessment/ Detection Monitoring Sampling	July 2018 - Verification Sampling	November 2018 - Nature and Extent Sampling	November 2018 - Assessment/ Detection Monitoring Sampling	December 2018 - Nature and Extent Sampling
MW-B1	-	4/3/2018	5/24/2018	-	-	11/2/2018	-
MW-B2	-	4/2/2018	5/24/2018	-	-	11/6/2018	-
MW-1	1/10/2018	4/3/2018	5/24/2018	7/3/2018	-	11/2/2018	-
MW-2	1/10/2018	4/2/2018	5/24/2018	7/3/2018	-	11/5/2018	-
MW-3	1/10/2018	4/2/2018	5/24/2018	7/3/2018	-	11/2/2018	-
MW-4	1/10/2018	4/2/2018	5/24/2018	7/3/2018	-	11/1/2018	-
MW-5	-	4/2/2018	5/24/2018	-	-	11/1/2018	-
MW-6	1/10/2018	4/2/2018	5/25/2018	-	-	11/6/2018	-
MW-7	1/10/2018	4/2/2018	5/25/2018	7/3/2018	-	11/2/2018	-
R-P-01S	-	-	-	-	11/1/2018	-	-
R-P-03D	-	-	-	-	11/5/2018	-	-
R-P-03S	-	-	-	-	11/5/2018	-	-
R-P-05I	-	-	-	-	11/1/2018	-	-
R-P-05S	-	-	-	-	11/1/2018	-	-
R-P-08D	-	-	-	-	11/5/2018	-	-
R-P-08S	-	-	-	-	11/5/2018	-	-
R-P-10S	-	-	-	-	11/5/2018	-	-
R-P-13D	-	-	-	-	11/5/2018	-	-
R-P-13I	-	-	-	-	11/5/2018	-	-
R-P-13S	-	-	-	-	11/5/2018	-	-
R-P-17D	-	-	-	-	11/5/2018	-	-
R-P-17I	-	-	-	-	11/2/2018	-	-
R-P-17S	-	-	-	-	11/2/2018	-	-
R-P-19D	-	-	-	-	11/5/2018	-	-
R-P-19I	-	-	-	-	11/5/2018	-	-
R-P-19S	-	-	-	-	11/5/2018	-	-
R-P-21D	-	-	-	-	11/2/2018	-	-
R-P-21I	-	-	-	-	11/2/2018	-	-
R-P-21S	-	-	-	-	11/2/2018	-	-
R-P-22D	-	-	-	-	11/2/2018	-	-
R-P-22I	-	-	-	-	11/2/2018	-	-
R-P-22S	-	-	-	-	11/1/2018	-	-
R-P-27S	-	-	-	-	11/6/2018	-	-
R-P-28S	-	-	-	-	11/6/2018	-	-
R-P-29D	-	-	-	-	11/6/2018	-	-
R-P-29S	-	-	-	-	11/6/2018	-	12/6/2018
R-P-30S	-	-	-	-	11/5/2018	-	-
R-P-31S	-	-	-	-	11/6/2018	-	-
Detection or Assessment Monitoring	Detection	Assessment	Assessment/ Detection	Detection	Assessment	Assessment/ Detection	Assessment

Notes:

- 1.) Verification Sampling Events tested for Appendix III Parameters with initial exceedances that have not already been verified.
- 2.) Detection Monitoring Events tested for Appendix III Parameters.
- 3.) Assessment Monitoring Events sampled for Appendix IV Parameters.
- 4.) "-" No sample collected.

Prepared by: RJF
Checked by: MSG
Reviewed by: MNH

Table 3
November 2017 Detection Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS						
			MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
November 2017 Detection Monitoring Event											
DATE	NA	NA	11/9/2017	11/9/2017	11/9/2017	11/9/2017	11/9/2017	11/10/2017	11/10/2017	11/9/2017	11/9/2017
pH	SU	6.25-7.12	6.56	6.61	9.40	10.66	9.59	7.26	6.64	7.10	6.79
BORON, TOTAL	µg/L	151	ND	ND	1,480	5,650	15,400	4,260	ND	747	2,370
CALCIUM, TOTAL	µg/L	161000	155,000	112,000	68,800	9,440	5,790	66,900	124,000	98,200	73,000
CHLORIDE, TOTAL	mg/L	60.6	45.4	37.1	18.9	27.6	31.3	19.8	3.8	5.4	12.6
FLUORIDE, TOTAL	mg/L	0.2283	0.16 J	0.18 J	0.20 J	0.87	0.90	0.88	0.17 J	0.19 J	0.33
SULFATE, TOTAL	mg/L	46.9	38.2	12.5	382	294	175	44.6	2.0	33.0	46.8
TOTAL DISSOLVED SOLIDS	mg/L	757	685	437	585	792	697	417	407	366	388
January 2018 Verification Sampling											
DATE	NA	NA			1/10/2018	1/10/2018	1/10/2018	1/10/2018		1/10/2018	1/10/2018
pH	SU	6.25-7.12			8.03	11.01	9.94	7.51			
BORON, TOTAL	µg/L	151			1,970	3,450	15,700	4,160		840	2,360
CALCIUM, TOTAL	µg/L	161000									
CHLORIDE, TOTAL	mg/L	60.6									
FLUORIDE, TOTAL	mg/L	0.2283				0.73	0.88	0.87			0.26
SULFATE, TOTAL	mg/L	46.9			266	273	158				
TOTAL DISSOLVED SOLIDS	mg/L	757				744					

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

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

Table 4
May 2018 Detection Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
			MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	
May 2018 Detection Monitoring Event												
DATE	NA	NA	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/25/2018	5/25/2018
pH	SU	6.25-7.12	7.11	7.35	9.12	10.64	9.82	7.09	6.93	6.95	7.28	
BORON, TOTAL	µg/L	151	115	44.2 J	1,960	2,990	14,700	4,240 J	108	546	2,390	
CALCIUM, TOTAL	µg/L	161000	145,000	107,000	26,900	8,940	6,030	71,400 J	124,000	82,200	72,300	
CHLORIDE, TOTAL	mg/L	60.6	49.4	46.3	20.1	25.1	31.2	19.9	6.1	4.2	15.3	
FLUORIDE, TOTAL	mg/L	0.2283	0.16 J	0.18 J	0.39	0.82	0.78	0.79	0.16 J	0.22	0.35	
SULFATE, TOTAL	mg/L	46.9	39.0	17.0	261	293	194	48.0	12.9	31.0	89.5	
TOTAL DISSOLVED SOLIDS	mg/L	757	672	474	477	781	764	428	435	326	405	
July 2018 Verification Sampling												
DATE	NA	NA			7/3/2018	7/3/2018	7/3/2018	7/3/2018			7/3/2018	
pH	SU	6.25-7.12			9.15	10.81	10.05	7.12			7.15	
BORON, TOTAL	µg/L	151									2,400	
CALCIUM, TOTAL	µg/L	161000										
CHLORIDE, TOTAL	mg/L	60.6										
FLUORIDE, TOTAL	mg/L	0.2283			0.44						0.37	
SULFATE, TOTAL	mg/L	46.9						47.1			83.7	
TOTAL DISSOLVED SOLIDS	mg/L	757				813	776					

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. Prediction Limits calculated using Sanitas Software.
6. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.
7. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
8. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
9. Only analytes/wells that were detected above the prediction limit and that had not already been verified were tested during Verification Sampling.

Prepared By: JSI
Checked By: MSG
Reviewed By: MNH

Table 5
November 2018 Detection Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS						
		MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
November 2018 Detection Monitoring Event										
DATE	NA	11/2/2018	11/6/2018	11/2/2018	11/5/2018	11/2/2018	11/1/2018	11/1/2018	11/6/2018	11/2/2018
pH	SU	7.04	7.22	9.73	12.59	9.96	7.34	6.66	7.11	7.30
BORON, TOTAL	µg/L	140	35.9 J	2,470	3,290	13,800	4,000	115	887	2,480
CALCIUM, TOTAL	µg/L	132,000	109,000	26,800	8,840	5,480	60,500	130,000	86,800	66,700
CHLORIDE, TOTAL	mg/L	40.7	40.2	21.4	23.4	30.5	20.9	7.4	6.3	14.6
FLUORIDE, TOTAL	mg/L	ND	0.22	0.36	1.2	0.95	0.92	ND	0.26	0.33
SULFATE, TOTAL	mg/L	42.5	13.1	226	318 J	132	51.8	14.3	22.8	77.7
TOTAL DISSOLVED SOLIDS	mg/L	652	425	450	768	722	99.0 J	411	290	404

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units.
2. J - Result is an estimated value.
3. 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.

Table 6
April 2018 Assessment Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS						
		MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Field Parameters										
DATE	NA	4/3/2018	4/2/2018	4/3/2018	4/2/2018	4/2/2018	4/2/2018	4/2/2018	4/2/2018	4/2/2018
DISSOLVED OXYGEN	mg/L	1.00	0.47	1.20	0.21	0.31	0.71	1.10	2.77	0.61
pH	SU	6.79	7.24	9.47	10.84	9.85	7.25	7.21	7.15	7.08
REDOX POTENTIAL	mV	-98.7	-150.3	87.3	-167.6	-196.7	-30.6	-18.5	-34.3	87.6
SPECIFIC CONDUCTIVITY	mS/cm	1.289	0.608	0.781	1.069	1.099	0.709	0.797	0.595	0.698
TURBIDITY	NTU	4.65	9.34	0.60	2.78	2.01	1.49	4.70	8.85	2.21
Appendix IV Parameters										
ANTIMONY, TOTAL	µg/L	ND	ND	1.2	4.7	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	24.3	1.9	20.8	232	86.1	6.7	3.6	0.38 J	90.8
BARIUM, TOTAL	µg/L	494	430	16.0	10.2	14.2	266	378	169	307
BERYLLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
CADMIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
CHROMIUM, TOTAL	µg/L	0.087 J	0.15 J	0.086 J	0.61 J	0.49 J	0.24 J	0.34 J	ND	0.15 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
LEAD, TOTAL	µg/L	ND	ND	ND	7.3 J	4.0 J	ND	ND	ND	ND
LITHIUM, TOTAL	µg/L	61.1	9.6 J	ND	ND	ND	39.6	ND	ND	33.4
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	ND	ND	52.4	156	655	80.8	ND	2.3 J	190
RADIUM [226 + 228]	pCi/L	2.297	1.684	ND	ND	ND	1.932	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	6.0	2.8	ND	ND	ND	ND	ND
THALLIUM, TOTAL	µg/L	ND	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. Values displayed as ND.
4. NA - Not applicable.
5. 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.
6. Statistical Analysis for the Assessment Monitoring data is provided in Appendix B.

Table 7
May 2018 Assessment Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS						
		MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Field Parameters										
DATE	NA	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/24/2018	5/25/2018	5/25/2018
DISSOLVED OXYGEN	mg/L	0.98	1.20	1.03	0.85	0.75	0.71	0.81	4.31	2.28
pH	SU	7.11	7.35	9.12	10.64	9.82	7.09	6.93	6.95	7.28
REDOX POTENTIAL	mV	-38.2	-7.4	-31.4	-168.6	-186.8	-68.5	46.4	66.3	-136.5
SPECIFIC CONDUCTIVITY	mS/cm	1.229	0.814	0.761	1.142	1.138	0.705	0.771	0.586	0.696
TURBIDITY	NTU	4.42	2.78	3.27	3.72	3.61	2.40	2.74	4.43	2.96
Appendix IV Parameters										
ANTIMONY, TOTAL	µg/L	ND	ND	0.95 J	4.0	ND	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	20.4	2.1	17.1	211	96.6	7.2	3.8	ND	91.6
BARIUM, TOTAL	µg/L	456	419	17.0	10.0	13.2	283	371	123	305
LITHIUM, TOTAL	µg/L	61.9	9.3 J	ND	ND	ND	47.8	5.3 J	ND	35.1
MOLYBDENUM, TOTAL	µg/L	ND	ND	54.0	202	759	90.0	ND	1.5 J	187
RADIUM [226 + 228]	pCi/L	1.486	ND	ND	ND	ND	ND	1.829 J	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	4.1	0.84 J	0.59 J	ND	ND	ND	ND

NOTES

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. Values displayed as ND.
4. NA - Not applicable.
5. 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.
6. Statistical Analysis for the Assessment Monitoring data is provided in Appendix B.

Table 8
November 2018 Assessment Monitoring Results
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS						
		MW-B1	MW-B2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
Field Parameters										
DATE	NA	11/2/2018	11/6/2018	11/2/2018	11/5/2018	11/2/2018	11/1/2018	11/1/2018	11/6/2018	11/2/2018
DISSOLVED OXYGEN	mg/L	0.26	0.18	1.62	0.73	0.03	0.80	0.46	3.05	0.26
pH	SU	7.04	7.22	9.73	12.59	9.96	7.34	6.66	7.11	7.30
REDOX POTENTIAL	mV	-136.0	-122.0	47.6	-227.5	-218.3	-165.4	-102.8	108.8	-184.3
SPECIFIC CONDUCTIVITY	mS/cm	1.501	0.630	0.953	1.099	1.180	0.930	0.808	0.558	0.871
TURBIDITY	NTU	6.88	1.62	2.48	4.50	2.23	0.98	0.90	4.33	7.62
Appendix IV Parameters										
ANTIMONY, TOTAL	µg/L	ND	ND	0.55 J	3.8	0.15 J	ND	ND	ND	ND
ARSENIC, TOTAL	µg/L	24.8	2.2	10.1	197	79.7	6.3	3.6	ND	84.9
BARIUM, TOTAL	µg/L	432	415	15.1	9.5	12.1	237	378	105	280
LITHIUM, TOTAL	µg/L	60.2	14.3	ND	ND	ND	40.3	8.6 J	5.1 J	30.1
MOLYBDENUM, TOTAL	µg/L	ND	ND	102	170	736	89.6	ND	ND	162
RADIUM [226 + 228]	pCi/L	ND	ND	ND	ND	ND	ND	1.366	ND	1.426
SELENIUM, TOTAL	µg/L	ND	0.10 J	1.8	0.88 J	0.71 J	0.14 J	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. Values displayed as ND.
4. NA - Not applicable.
5. 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.

Figures

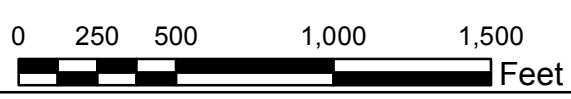


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LEGEND
 Rush Island Energy Center Property Boundary
 RCPA Surface Impoundment

Groundwater Monitoring Wells and Piezometer Locations
 CCR Rule Groundwater Monitoring Wells
 Nature and Extent Investigation Monitoring Wells

NOTES
 1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE. SOME PIEZOMETER LOCATIONS OFFSET FOR CLARITY PURPOSES.
 2.) CCR RULE WELLS WERE SURVEYED BY ZAHNER AND ASSOCIATES, INC.
REFERENCE
 1.) AMEREN MISSOURI RUSH ISLAND ENERGY CENTER, RUSH ISLAND PROPERTY CONTROL MAP, JANUARY 2012.
 2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2401 FEET.



CLIENT
 AMEREN MISSOURI
 RUSH ISLAND ENERGY CENTER
PROJECT
 GROUNDWATER MONITORING PROGRAM



TITLE
 SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

CONSULTANT	YYYY-MM-DD	2019-01-07
	PREPARED	RJF
	DESIGN	JSI
	REVIEW	JSI
	APPROVED	MNH



PROJECT No. 153-1406	PHASE 0002	REVIEW 0.0	FIGURE 1
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM 11m

Appendices

APPENDIX A

Laboratory Analytical Data

January 12, 2018

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

RE: Project: AMEREN RUSH ISLAND ENERGY CTR
Pace Project No.: 60261868

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on January 10, 2018. 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 RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

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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SAMPLE SUMMARY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60261868001	R-MW-1	Water	01/10/18 12:53	01/10/18 22:15
60261868002	R-MW-2	Water	01/10/18 11:53	01/10/18 22:15
60261868003	R-MW-3	Water	01/10/18 10:35	01/10/18 22:15
60261868004	R-MW-4	Water	01/10/18 09:05	01/10/18 22:15
60261868005	R-MW-6	Water	01/10/18 13:15	01/10/18 22:15
60261868006	R-MW-7	Water	01/10/18 14:05	01/10/18 22:15
60261868007	R-DUP-1	Water	01/10/18 14:05	01/10/18 22:15
60261868008	R-FB-1	Water	01/10/18 12:30	01/10/18 22:15

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60261868001	R-MW-1	EPA 200.7	TDS	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261868002	R-MW-2	EPA 200.7	TDS	2	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261868003	R-MW-3	EPA 200.7	TDS	1	PASI-K
		EPA 300.0	OL	2	PASI-K
60261868004	R-MW-4	EPA 200.7	TDS	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261868005	R-MW-6	EPA 200.7	TDS	1	PASI-K
60261868006	R-MW-7	EPA 200.7	TDS	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261868007	R-DUP-1	EPA 200.7	TDS	1	PASI-K
		EPA 300.0	OL	2	PASI-K
60261868008	R-FB-1	EPA 200.7	TDS	2	PASI-K
		SM 2540C	LDF	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-1 **Lab ID: 60261868001** Collected: 01/10/18 12:53 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	1970	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 10:57	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	266	mg/L	20.0	10.0	20		01/12/18 12:41	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-2 **Lab ID: 60261868002** Collected: 01/10/18 11:53 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	3450	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 10:59	7440-42-8	
Calcium	7870	ug/L	100	36.0	1	01/11/18 15:30	01/12/18 10:59	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	744	mg/L	5.0	5.0	1		01/11/18 16:29		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	25.3	mg/L	2.0	1.0	2		01/12/18 12:54	16887-00-6	M1
Fluoride	0.73	mg/L	0.20	0.10	1		01/12/18 11:30	16984-48-8	
Sulfate	273	mg/L	20.0	10.0	20		01/12/18 14:31	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-3 **Lab ID: 60261868003** Collected: 01/10/18 10:35 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	15700	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:11	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	0.88	mg/L	0.20	0.10	1		01/12/18 12:12	16984-48-8	
Sulfate	158	mg/L	10.0	5.0	10		01/12/18 15:13	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-4 **Lab ID: 60261868004** Collected: 01/10/18 09:05 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	4160	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:13	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	0.87	mg/L	0.20	0.10	1		01/12/18 12:26	16984-48-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-6 **Lab ID: 60261868005** Collected: 01/10/18 13:15 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Boron	840	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:15	7440-42-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-MW-7 **Lab ID: 60261868006** Collected: 01/10/18 14:05 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	2360	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:18	7440-42-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	0.26	mg/L	0.20	0.10	1		01/12/18 12:40	16984-48-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-DUP-1 **Lab ID: 60261868007** Collected: 01/10/18 14:05 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	15200	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:20	7440-42-8	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Fluoride	0.88	mg/L	0.20	0.10	1		01/12/18 12:54	16984-48-8	
Sulfate	142	mg/L	10.0	5.0	10		01/12/18 14:17	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Sample: R-FB-1 **Lab ID: 60261868008** Collected: 01/10/18 12:30 Received: 01/10/18 22:15 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	45.6J	ug/L	100	3.5	1	01/11/18 15:30	01/12/18 11:22	7440-42-8	
Calcium	<36.0	ug/L	100	36.0	1	01/11/18 15:30	01/12/18 11:22	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		01/11/18 16:30		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.50	mg/L	1.0	0.50	1		01/12/18 13:08	16887-00-6	
Fluoride	<0.10	mg/L	0.20	0.10	1		01/12/18 13:08	16984-48-8	
Sulfate	<0.50	mg/L	1.0	0.50	1		01/12/18 13:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

QC Batch: 510302

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60261868001, 60261868002, 60261868003, 60261868004, 60261868005, 60261868006, 60261868007, 60261868008

METHOD BLANK: 2089715

Matrix: Water

Associated Lab Samples: 60261868001, 60261868002, 60261868003, 60261868004, 60261868005, 60261868006, 60261868007, 60261868008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<3.5	100	3.5	01/12/18 10:55	
Calcium	ug/L	<36.0	100	36.0	01/12/18 10:55	

LABORATORY CONTROL SAMPLE: 2089716

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	990	99	85-115	
Calcium	ug/L	10000	10100	101	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2089717 2089718

Parameter	Units	60261868002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	3450	1000	1000	4230	4390	78	94	70-130	4	20	
Calcium	ug/L	7870	10000	10000	17100	17800	92	99	70-130	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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

QC Batch: 510300

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60261868002, 60261868008

METHOD BLANK: 2089710

Matrix: Water

Associated Lab Samples: 60261868002, 60261868008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/11/18 16:25	

LABORATORY CONTROL SAMPLE: 2089711

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	929	93	80-120	

SAMPLE DUPLICATE: 2089712

Parameter	Units	60261868002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	744	723	3	10	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

QC Batch: 510341

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60261868002, 60261868003, 60261868004, 60261868006, 60261868007, 60261868008

METHOD BLANK: 2089919

Matrix: Water

Associated Lab Samples: 60261868002, 60261868003, 60261868004, 60261868006, 60261868007, 60261868008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/12/18 13:49	
Fluoride	mg/L	<0.10	0.20	0.10	01/12/18 13:49	
Sulfate	mg/L	<0.50	1.0	0.50	01/12/18 13:49	

LABORATORY CONTROL SAMPLE: 2089920

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	105	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2089921 2089922

Parameter	Units	60261868002		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec							
Fluoride	mg/L	0.73	2.5	2.5	3.5	3.5	112	111	80-120	1	15				
Sulfate	mg/L	273	100	100	379	380	106	106	80-120	0	15				

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

QC Batch: 510415

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60261868001, 60261868002

METHOD BLANK: 2090230

Matrix: Water

Associated Lab Samples: 60261868001, 60261868002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/12/18 10:43	
Sulfate	mg/L	<0.50	1.0	0.50	01/12/18 10:43	

LABORATORY CONTROL SAMPLE: 2090231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	101	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2090232 2090233

Parameter	Units	60261868002		2090233		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	25.3	10	10	35.2	38.5	98	131	9	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60261868

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60261868001	R-MW-1	EPA 200.7	510302	EPA 200.7	510356
60261868002	R-MW-2	EPA 200.7	510302	EPA 200.7	510356
60261868003	R-MW-3	EPA 200.7	510302	EPA 200.7	510356
60261868004	R-MW-4	EPA 200.7	510302	EPA 200.7	510356
60261868005	R-MW-6	EPA 200.7	510302	EPA 200.7	510356
60261868006	R-MW-7	EPA 200.7	510302	EPA 200.7	510356
60261868007	R-DUP-1	EPA 200.7	510302	EPA 200.7	510356
60261868008	R-FB-1	EPA 200.7	510302	EPA 200.7	510356
60261868002	R-MW-2	SM 2540C	510300		
60261868008	R-FB-1	SM 2540C	510300		
60261868001	R-MW-1	EPA 300.0	510415		
60261868002	R-MW-2	EPA 300.0	510341		
60261868002	R-MW-2	EPA 300.0	510415		
60261868003	R-MW-3	EPA 300.0	510341		
60261868004	R-MW-4	EPA 300.0	510341		
60261868006	R-MW-7	EPA 300.0	510341		
60261868007	R-DUP-1	EPA 300.0	510341		
60261868008	R-FB-1	EPA 300.0	510341		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60261868



60261868

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 ^{CF 0.0} T-239 ^{CF +0.2} Type of Ice: Wet Blue None

NMS 1/11

Cooler Temperature (°C): As-read 4.0 Corr. Factor ^{CF 0.0} 0F +0.2 Corrected 4.0

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 type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Rush Turn Around Time requested:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1/12/18
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 type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Cyanide water sample checks:	<input checked="" type="checkbox"/> N/A	
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Check _____ Date: 1/11/18

WO#: 60261868

PM: JLS Due Date: 01/25/18
 CLIENT: GOLDER STL

STUDY / Analytical Request Document

LEGAL DOCUMENT. All relevant fields must be completed accurately

Section A

Required Client Information:

Company: Golder Associates

Address: 820 South Main Street, Suite 100

City: St Charles, MO 63301

Email To: maddock@golder.com

Phone: 636-724-9191 Fax: 636-724-9323

Requested Due Date/TAT: Jan 12, 2018

Section C

Required Project Information:

Report To: Mark Haddock (mhaddock@golder.com)

Copy To: Jeffrey Ingram

Company Name: Ryan-Feldmann@golder.com

Address: Project Name: Ameren Rush Island Energy Center

Purchase Order No.: Project Number: 153-1406, 0002 E

Pages Profile #: 9285

Section D

Required Client Information:

Company Name: Mark Haddock (mhaddock@golder.com)

Address: St Charles, MO 63301

Pages Profile #: 9285

Page: [] of []

REGULATORY AGENCY
 NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location: MO STATE: MO

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WATER WW WASTE WATER F PRODUCT P SOIL/SOLID SL OIL CL WF AR OT TS	Section D Required Client Information SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	# OF CONTAINERS	Requested Analysis Filtered (Y/N)											Pace Project No./ Lab I.D.																			
			COMPOSITE START	COMPOSITE END/GRAB				DATE	TIME	DATE	TIME	Preservatives	Unpreserved	H ₂ SO ₄	HNO ₃	HCl	NaOH	Na ₂ S ₂ O ₃		Methanol	Other	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)										
1		R-MW-1			G	WT	2																															
2		R-MW-2			G	WT	1																															
3		R-MW-3			G	WT	1																															
4		R-MW-4			G	WT	1																															
5		R-MW-6			G	WT	1																															
6		R-MW-7			G	WT	1																															
7		R-Dwd-1			G	WT	1																															
8		R-FB-1			G	WT	1																															
9		R-MW-2-MS			G	WT	1																															
10		R-MW-2-MSD			G	WT	1																															
11					G	WT	1																															
12					G	WT	1																															

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
Confirm sample	Jeffrey Ingram / Golder	1-10-18	1600	Ryan Feldmann	1/10/18	1600	
analysis w/ Jeff Ingram	Jeffrey Ingram / PACE	1/10/18	1700	Ryan Feldmann	1/10/18	2225	4.0 Y Y Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on	Closely Sealed	Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER: Ryan Feldmann	SIGNATURE of SAMPLER: Ryan Feldmann					
		DATE Signed (MM/DD/YYYY): 01/10/18				



MEMORANDUM

DATE January 15, 2018

Project No. 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin

EMAIL Tommy_Goodwin@golder.com

DATA VALIDATION SUMMARY, RUSH ISLAND ENERGY CENTER– AMEREN GROUNDWATER – DATA PACKAGE 60261868

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

- Chloride exceeded the recovery criteria for MS. Data was not qualified on MS/MSD data alone.
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates Project Manager: J Ingram
 Project Name: Ameren-Rush Island-2018 January Verification Project Number: 1531406.0002
 Reviewer: T Goodwin Validation Date: 7/15/18

Laboratory: Pace Analytical SDG #: 60261868
 Analytical Method (type and no.): 200.7 Metals, 2540C TDS, 300.0 Anions
 Matrix: Air Soil/Sed. Water Waste
 Sample Names R-MW-1, R-MW-2, R-MW-3, R-MW-4, R-MW-5, R-MW-6, R-MW-7, R-DUP-1, R-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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chloride, Sulfate
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chloride

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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B (45.6)
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"/>	Dup-1@ R-MW-3
				FB-1@R-MW-1
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"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
b) Was MSD accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	chloride (¹³⁴ 120)
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:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
R-MW-1	Sulfate	266	D	Result had a dilution factor of 20
R-MW-2	Chloride	25.3	D	<div style="display: flex; align-items: center; justify-content: center;"> <div style="border-left: 1px solid black; border-right: 1px solid black; height: 100px; margin: 0 10px;"></div> <div style="text-align: center;">2 20 10 10</div> </div>
L	Sulfate	273	D	
R-MW-3	Sulfate	158	D	
R-DUP-1	Sulfate	142	D	
R-FB-1	Boron (B)	45.6	J	Result between PQL + MDL.
<div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> 16 </div>				

Signature: Tommy J. Goodwin

Date: 1/15/2018

April 26, 2018

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

RE: Project: AMEREN RUSH ISLAND ASSESSMENT
Pace Project No.: 60267330

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on April 04, 2018. 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 RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Pennsylvania Certification IDs

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

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 #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

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

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60267330001	R-MW-1	Water	04/03/18 08:50	04/04/18 03:45
60267330002	R-MW-2	Water	04/02/18 16:30	04/04/18 03:45
60267330003	R-MW-3	Water	04/02/18 15:10	04/04/18 03:45
60267330004	R-MW-4	Water	04/02/18 13:20	04/04/18 03:45
60267330005	R-MW-5	Water	04/02/18 12:15	04/04/18 03:45
60267330006	R-MW-6	Water	04/02/18 13:35	04/04/18 03:45
60267330007	R-MW-7	Water	04/02/18 11:00	04/04/18 03:45
60267330008	R-MW-B1	Water	04/03/18 09:05	04/04/18 03:45
60267330009	R-MW-B2	Water	04/02/18 16:45	04/04/18 03:45
60267330010	R-DUP-1	Water	04/02/18 08:00	04/04/18 03:45
60267330011	R-FB-1	Water	04/02/18 13:25	04/04/18 03:45
60267330012	R-MW-4 MS	Water	04/02/18 13:20	04/04/18 03:45
60267330013	R-MW-4 MSD	Water	04/02/18 13:20	04/04/18 03:45

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60267330001	R-MW-1	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330002	R-MW-2	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330003	R-MW-3	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330004	R-MW-4	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330005	R-MW-5	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330006	R-MW-6	EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
60267330007	R-MW-7	EPA 200.7	TDS	12	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60267330008	R-MW-B1	EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60267330009	R-MW-B2	EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
60267330010	R-DUP-1	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
60267330011	R-FB-1	EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	AGO	3	PASI-K
		EPA 200.7	TDS	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	CRN	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60267330012	R-MW-4 MS	EPA 300.0	AGO	3	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60267330013	R-MW-4 MSD	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-1 Lab ID: 60267330001 Collected: 04/03/18 08:50 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	16.0	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:09	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:09	7440-41-7	
Calcium	25600	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:09	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:09	7440-48-4	
Iron	9.2J	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:09	7439-89-6	B
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:09	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:09	7439-93-2	
Magnesium	614	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:09	7439-95-4	
Manganese	3.3J	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:09	7439-96-5	
Molybdenum	52.4	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:09	7439-98-7	
Potassium	6250	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:09	7440-09-7	
Sodium	123000	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:09	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	1.2	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:30	7440-36-0	
Arsenic	20.8	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:30	7440-38-2	
Cadmium	0.034J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:30	7440-43-9	B
Chromium	0.086J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:30	7440-47-3	
Selenium	6.0	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:30	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:30	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:21	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	19.3	mg/L	2.0	0.92	2		04/11/18 13:12	16887-00-6	
Fluoride	0.51	mg/L	0.20	0.063	1		04/11/18 12:31	16984-48-8	
Sulfate	280	mg/L	20.0	4.7	20		04/11/18 13:26	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-2 **Lab ID: 60267330002** Collected: 04/02/18 16:30 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	10.2	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:11	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:11	7440-41-7	
Calcium	8340	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:11	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:11	7440-48-4	
Iron	192	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:11	7439-89-6	
Lead	7.3J	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:11	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:11	7439-93-2	
Magnesium	32.2J	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:11	7439-95-4	
Manganese	9.4	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:11	7439-96-5	
Molybdenum	156	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:11	7439-98-7	
Potassium	2970	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:11	7440-09-7	
Sodium	218000	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:11	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	4.7	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:34	7440-36-0	
Arsenic	232	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:34	7440-38-2	
Cadmium	0.26J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:34	7440-43-9	B
Chromium	0.61J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:34	7440-47-3	
Selenium	2.8	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:34	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:34	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:23	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	27.6	mg/L	2.0	0.92	2		04/11/18 13:53	16887-00-6	
Fluoride	0.76	mg/L	0.20	0.063	1		04/11/18 13:40	16984-48-8	
Sulfate	267	mg/L	20.0	4.7	20		04/11/18 14:07	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-3 **Lab ID: 60267330003** Collected: 04/02/18 15:10 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	14.2	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:18	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:18	7440-41-7	
Calcium	6050	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:18	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:18	7440-48-4	
Iron	164	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:18	7439-89-6	
Lead	4.0J	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:18	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:18	7439-93-2	
Magnesium	66.9	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:18	7439-95-4	
Manganese	5.7	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:18	7439-96-5	
Molybdenum	655	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:18	7439-98-7	
Potassium	1840	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:18	7440-09-7	
Sodium	242000	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:18	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.23J	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:38	7440-36-0	B
Arsenic	86.1	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:38	7440-38-2	
Cadmium	0.081J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:38	7440-43-9	B
Chromium	0.49J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:38	7440-47-3	
Selenium	0.82J	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:38	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:38	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:25	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	29.9	mg/L	2.0	0.92	2		04/11/18 14:34	16887-00-6	
Fluoride	0.86	mg/L	0.20	0.063	1		04/11/18 14:20	16984-48-8	
Sulfate	192	mg/L	20.0	4.7	20		04/11/18 14:48	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-4 **Lab ID: 60267330004** Collected: 04/02/18 13:20 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	266	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:21	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:21	7440-41-7	
Calcium	68300	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:21	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:21	7440-48-4	
Iron	5030	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:21	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:21	7439-92-1	
Lithium	39.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:21	7439-93-2	
Magnesium	13900	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:21	7439-95-4	
Manganese	271	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:21	7439-96-5	
Molybdenum	80.8	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:21	7439-98-7	
Potassium	4660	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:21	7440-09-7	
Sodium	52000	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:21	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.092J	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:42	7440-36-0	B
Arsenic	6.7	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:42	7440-38-2	
Cadmium	0.051J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:42	7440-43-9	B
Chromium	0.24J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:42	7440-47-3	
Selenium	0.24J	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:42	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:42	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:27	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	19.9	mg/L	5.0	2.3	5		04/11/18 16:10	16887-00-6	
Fluoride	0.79	mg/L	0.20	0.063	1		04/11/18 15:02	16984-48-8	
Sulfate	51.9	mg/L	5.0	1.2	5		04/11/18 16:10	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-5 **Lab ID: 60267330005** Collected: 04/02/18 12:15 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium	378	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:27	7440-39-3	
Beryllium	0.18J	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:27	7440-41-7	B
Calcium	129000	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:27	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:27	7440-48-4	
Iron	10800	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:27	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:27	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:27	7439-93-2	
Magnesium	17900	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:27	7439-95-4	
Manganese	436	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:27	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:27	7439-98-7	
Potassium	2190	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:27	7440-09-7	
Sodium	4730	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:27	7440-23-5	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.11J	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:55	7440-36-0	B
Arsenic	3.6	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:55	7440-38-2	
Cadmium	0.035J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:55	7440-43-9	B
Chromium	0.34J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:55	7440-47-3	
Selenium	0.16J	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:55	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:55	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:34	7439-97-6	
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Chloride	7.2	mg/L	1.0	0.46	1		04/11/18 16:51	16887-00-6	
Fluoride	0.15J	mg/L	0.20	0.063	1		04/11/18 16:51	16984-48-8	
Sulfate	11.0	mg/L	1.0	0.24	1		04/11/18 16:51	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-6 **Lab ID: 60267330006** Collected: 04/02/18 13:35 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium	169	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:29	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:29	7440-41-7	
Calcium	90000	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:29	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:29	7440-48-4	
Iron	494	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:29	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:29	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:29	7439-93-2	
Magnesium	13500	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:29	7439-95-4	
Manganese	154	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:29	7439-96-5	
Molybdenum	2.3J	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:29	7439-98-7	
Potassium	1740	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:29	7440-09-7	
Sodium	18400	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:29	7440-23-5	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.14J	ug/L	1.0	0.026	1	04/05/18 09:24	04/25/18 23:59	7440-36-0	B
Arsenic	0.38J	ug/L	1.0	0.052	1	04/05/18 09:24	04/25/18 23:59	7440-38-2	
Cadmium	0.034J	ug/L	0.50	0.018	1	04/05/18 09:24	04/25/18 23:59	7440-43-9	B
Chromium	0.31J	ug/L	1.0	0.054	1	04/05/18 09:24	04/25/18 23:59	7440-47-3	
Selenium	0.57J	ug/L	1.0	0.086	1	04/05/18 09:24	04/25/18 23:59	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/25/18 23:59	7440-28-0	
7470 Mercury Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:40	7439-97-6	
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Chloride	8.6	mg/L	1.0	0.46	1		04/11/18 17:05	16887-00-6	
Fluoride	0.26	mg/L	0.20	0.063	1		04/11/18 17:05	16984-48-8	
Sulfate	32.4	mg/L	2.0	0.47	2		04/11/18 17:18	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-7 **Lab ID: 60267330007** Collected: 04/02/18 11:00 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	307	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:31	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:31	7440-41-7	
Calcium	74300	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:31	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:31	7440-48-4	
Iron	15900	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:31	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:31	7439-92-1	
Lithium	33.4	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:31	7439-93-2	
Magnesium	20600	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:31	7439-95-4	
Manganese	328	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:31	7439-96-5	
Molybdenum	190	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:31	7439-98-7	
Potassium	5340	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:31	7440-09-7	
Sodium	28400	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:31	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.13J	ug/L	1.0	0.026	1	04/05/18 09:24	04/26/18 00:03	7440-36-0	B
Arsenic	90.8	ug/L	1.0	0.052	1	04/05/18 09:24	04/26/18 00:03	7440-38-2	
Cadmium	0.028J	ug/L	0.50	0.018	1	04/05/18 09:24	04/26/18 00:03	7440-43-9	B
Chromium	0.15J	ug/L	1.0	0.054	1	04/05/18 09:24	04/26/18 00:03	7440-47-3	
Selenium	0.14J	ug/L	1.0	0.086	1	04/05/18 09:24	04/26/18 00:03	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/26/18 00:03	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:43	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	15.2	mg/L	1.0	0.46	1		04/11/18 17:32	16887-00-6	
Fluoride	0.36	mg/L	0.20	0.063	1		04/11/18 17:32	16984-48-8	
Sulfate	89.3	mg/L	5.0	1.2	5		04/11/18 17:46	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-B1 **Lab ID: 60267330008** Collected: 04/03/18 09:05 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total									
Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Barium	494	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:34	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:34	7440-41-7	
Calcium	156000	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:34	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:34	7440-48-4	
Iron	26900	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:34	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:34	7439-92-1	
Lithium	61.1	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:34	7439-93-2	
Magnesium	50600	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:34	7439-95-4	
Manganese	1280	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:34	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:34	7439-98-7	
Potassium	8930	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:34	7440-09-7	
Sodium	23600	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:34	7440-23-5	
200.8 MET ICPMS									
Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.11J	ug/L	1.0	0.026	1	04/05/18 09:24	04/26/18 00:25	7440-36-0	B
Arsenic	24.3	ug/L	1.0	0.052	1	04/05/18 09:24	04/26/18 00:25	7440-38-2	
Cadmium	0.028J	ug/L	0.50	0.018	1	04/05/18 09:24	04/26/18 00:25	7440-43-9	B
Chromium	0.087J	ug/L	1.0	0.054	1	04/05/18 09:24	04/26/18 00:25	7440-47-3	
Selenium	0.21J	ug/L	1.0	0.086	1	04/05/18 09:24	04/26/18 00:25	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/26/18 00:25	7440-28-0	
7470 Mercury									
Analytical Method: EPA 7470 Preparation Method: EPA 7470									
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:45	7439-97-6	
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Chloride	43.9	mg/L	5.0	2.3	5		04/11/18 18:00	16887-00-6	
Fluoride	0.15J	mg/L	0.20	0.063	1		04/11/18 18:41	16984-48-8	
Sulfate	44.1	mg/L	5.0	1.2	5		04/11/18 18:00	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-B2 **Lab ID: 60267330009** Collected: 04/02/18 16:45 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	430	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:36	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:36	7440-41-7	
Calcium	109000	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:36	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:36	7440-48-4	
Iron	9470	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:36	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:36	7439-92-1	
Lithium	9.6J	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:36	7439-93-2	
Magnesium	19800	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:36	7439-95-4	
Manganese	264	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:36	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:36	7439-98-7	
Potassium	2090	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:36	7440-09-7	
Sodium	24900	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:36	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.087J	ug/L	1.0	0.026	1	04/05/18 09:24	04/26/18 00:29	7440-36-0	B
Arsenic	1.9	ug/L	1.0	0.052	1	04/05/18 09:24	04/26/18 00:29	7440-38-2	
Cadmium	0.029J	ug/L	0.50	0.018	1	04/05/18 09:24	04/26/18 00:29	7440-43-9	B
Chromium	0.15J	ug/L	1.0	0.054	1	04/05/18 09:24	04/26/18 00:29	7440-47-3	
Selenium	0.15J	ug/L	1.0	0.086	1	04/05/18 09:24	04/26/18 00:29	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/26/18 00:29	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:47	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	51.8	mg/L	5.0	2.3	5		04/11/18 19:08	16887-00-6	
Fluoride	0.18J	mg/L	0.20	0.063	1		04/11/18 18:54	16984-48-8	
Sulfate	17.3	mg/L	1.0	0.24	1		04/11/18 18:54	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-DUP-1 **Lab ID: 60267330010** Collected: 04/02/18 08:00 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	13.3	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:38	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:38	7440-41-7	
Calcium	5900	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:38	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:38	7440-48-4	
Iron	184	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:38	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:38	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:38	7439-93-2	
Magnesium	62.1	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:38	7439-95-4	
Manganese	5.5	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:38	7439-96-5	
Molybdenum	678	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:38	7439-98-7	
Potassium	1760	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:38	7440-09-7	
Sodium	236000	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:38	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.26J	ug/L	1.0	0.026	1	04/05/18 09:24	04/26/18 00:41	7440-36-0	B
Arsenic	88.2	ug/L	1.0	0.052	1	04/05/18 09:24	04/26/18 00:41	7440-38-2	
Cadmium	0.099J	ug/L	0.50	0.018	1	04/05/18 09:24	04/26/18 00:41	7440-43-9	B
Chromium	0.43J	ug/L	1.0	0.054	1	04/05/18 09:24	04/26/18 00:41	7440-47-3	
Selenium	0.95J	ug/L	1.0	0.086	1	04/05/18 09:24	04/26/18 00:41	7782-49-2	
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/26/18 00:41	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:49	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	30.3	mg/L	10.0	4.6	10		04/11/18 19:35	16887-00-6	
Fluoride	0.86	mg/L	0.20	0.063	1		04/11/18 19:22	16984-48-8	
Sulfate	198	mg/L	10.0	2.4	10		04/11/18 19:35	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-FB-1 **Lab ID: 60267330011** Collected: 04/02/18 13:25 Received: 04/04/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<1.5	ug/L	5.0	1.5	1	04/05/18 09:24	04/09/18 18:45	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	04/05/18 09:24	04/09/18 18:45	7440-41-7	
Calcium	<53.5	ug/L	200	53.5	1	04/05/18 09:24	04/09/18 18:45	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	04/05/18 09:24	04/09/18 18:45	7440-48-4	
Iron	<6.1	ug/L	50.0	6.1	1	04/05/18 09:24	04/09/18 18:45	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	04/05/18 09:24	04/09/18 18:45	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	04/05/18 09:24	04/09/18 18:45	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	04/05/18 09:24	04/09/18 18:45	7439-95-4	
Manganese	<0.73	ug/L	5.0	0.73	1	04/05/18 09:24	04/09/18 18:45	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	04/05/18 09:24	04/09/18 18:45	7439-98-7	
Potassium	<79.3	ug/L	500	79.3	1	04/05/18 09:24	04/09/18 18:45	7440-09-7	
Sodium	<157	ug/L	500	157	1	04/05/18 09:24	04/09/18 18:45	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.091J	ug/L	1.0	0.026	1	04/05/18 09:24	04/26/18 00:50	7440-36-0	B
Arsenic	<0.052	ug/L	1.0	0.052	1	04/05/18 09:24	04/26/18 00:50	7440-38-2	
Cadmium	0.028J	ug/L	0.50	0.018	1	04/05/18 09:24	04/26/18 00:50	7440-43-9	B
Chromium	0.064J	ug/L	1.0	0.054	1	04/05/18 09:24	04/26/18 00:50	7440-47-3	
Selenium	0.15J	ug/L	1.0	0.086	1	04/05/18 09:24	04/26/18 00:50	7782-49-2	B
Thallium	<0.036	ug/L	1.0	0.036	1	04/05/18 09:24	04/26/18 00:50	7440-28-0	
7470 Mercury		Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	<0.090	ug/L	0.20	0.090	1	04/06/18 15:40	04/09/18 11:51	7439-97-6	
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.46	mg/L	1.0	0.46	1		04/11/18 19:49	16887-00-6	
Fluoride	<0.063	mg/L	0.20	0.063	1		04/11/18 19:49	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		04/11/18 19:49	14808-79-8	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

QC Batch: 520847 Analysis Method: EPA 7470
 QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
 Associated Lab Samples: 60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011

METHOD BLANK: 2131843 Matrix: Water
 Associated Lab Samples: 60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/09/18 11:14	

LABORATORY CONTROL SAMPLE: 2131844

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: 2131845 2131846

Parameter	Units	60267330004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.090	5	5	5.1	5.0	101	98	75-125	2	20	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT
Pace Project No.: 60267330

QC Batch: 520544 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011

METHOD BLANK: 2130651 Matrix: Water
Associated Lab Samples: 60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	04/09/18 18:07	
Beryllium	ug/L	0.20J	1.0	0.16	04/09/18 18:07	
Calcium	ug/L	<53.5	200	53.5	04/09/18 18:07	
Cobalt	ug/L	<0.87	5.0	0.87	04/09/18 18:07	
Iron	ug/L	8.1J	50.0	6.1	04/09/18 18:07	
Lead	ug/L	<3.0	10.0	3.0	04/09/18 18:07	
Lithium	ug/L	<4.6	10.0	4.6	04/09/18 18:07	
Magnesium	ug/L	<14.0	50.0	14.0	04/09/18 18:07	
Manganese	ug/L	<0.73	5.0	0.73	04/09/18 18:07	
Molybdenum	ug/L	<0.90	20.0	0.90	04/09/18 18:07	
Potassium	ug/L	<79.3	500	79.3	04/09/18 18:07	
Sodium	ug/L	<157	500	157	04/09/18 18:07	

LABORATORY CONTROL SAMPLE: 2130652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	998	100	85-115	
Beryllium	ug/L	1000	986	99	85-115	
Calcium	ug/L	10000	9670	97	85-115	
Cobalt	ug/L	1000	1000	100	85-115	
Iron	ug/L	10000	9780	98	85-115	
Lead	ug/L	1000	989	99	85-115	
Lithium	ug/L	1000	1020	102	85-115	
Magnesium	ug/L	10000	9840	98	85-115	
Manganese	ug/L	1000	972	97	85-115	
Molybdenum	ug/L	1000	997	100	85-115	
Potassium	ug/L	10000	9870	99	85-115	
Sodium	ug/L	10000	10000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130653 2130654

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Spike Conc.	Result	Spike Conc.	Result						
Barium	ug/L	266	1000	1000	1230	97	99	70-130	2	20	
Beryllium	ug/L	<0.16	1000	1000	963	96	98	70-130	2	20	
Calcium	ug/L	68300	10000	10000	77900	96	111	70-130	2	20	
Cobalt	ug/L	<0.87	1000	1000	945	94	97	70-130	3	20	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130653												2130654	
Parameter	Units	60267330004 Result	MS	MSD	MS	MSD	MS	MSD	% Rec	Max	RPD	Qual	
			Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec	Limits				
Iron	ug/L	5030	10000	10000	14300	14600	93	95	70-130	2	20		
Lead	ug/L	<3.0	1000	1000	925	955	92	95	70-130	3	20		
Lithium	ug/L	39.6	1000	1000	1030	1060	99	102	70-130	2	20		
Magnesium	ug/L	13900	10000	10000	22700	23200	88	94	70-130	2	20		
Manganese	ug/L	271	1000	1000	1180	1210	91	94	70-130	2	20		
Molybdenum	ug/L	80.8	1000	1000	1040	1070	96	99	70-130	3	20		
Potassium	ug/L	4660	10000	10000	14000	14300	94	96	70-130	2	20		
Sodium	ug/L	52000	10000	10000	61700	63000	97	109	70-130	2	20		

MATRIX SPIKE SAMPLE: 2130655									
Parameter	Units	60267330009	Spike	MS	MS	% Rec	Qualifiers		
		Result	Conc.	Result	% Rec	Limits			
Barium	ug/L	430	1000	1430	100	70-130			
Beryllium	ug/L	<0.16	1000	980	98	70-130			
Calcium	ug/L	109000	10000	120000	110	70-130			
Cobalt	ug/L	<0.87	1000	970	97	70-130			
Iron	ug/L	9470	10000	18800	93	70-130			
Lead	ug/L	<3.0	1000	954	95	70-130			
Lithium	ug/L	9.6J	1000	1030	102	70-130			
Magnesium	ug/L	19800	10000	28900	91	70-130			
Manganese	ug/L	264	1000	1200	93	70-130			
Molybdenum	ug/L	<0.90	1000	995	99	70-130			
Potassium	ug/L	2090	10000	11800	97	70-130			
Sodium	ug/L	24900	10000	35400	104	70-130			

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

QC Batch:	520546	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011		

METHOD BLANK:	2130660	Matrix:	Water
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	0.089J	1.0	0.026	04/25/18 23:13	
Arsenic	ug/L	<0.052	1.0	0.052	04/25/18 23:13	
Cadmium	ug/L	0.031J	0.50	0.018	04/25/18 23:13	
Chromium	ug/L	<0.054	1.0	0.054	04/25/18 23:13	
Selenium	ug/L	0.089J	1.0	0.086	04/25/18 23:13	
Thallium	ug/L	<0.036	1.0	0.036	04/25/18 23:13	

LABORATORY CONTROL SAMPLE: 2130661

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.6	99	85-115	
Arsenic	ug/L	40	39.8	99	85-115	
Cadmium	ug/L	40	39.5	99	85-115	
Chromium	ug/L	40	39.9	100	85-115	
Selenium	ug/L	40	39.4	98	85-115	
Thallium	ug/L	40	37.3	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2130662 2130663

Parameter	Units	60267330004		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec				
Antimony	ug/L	0.092J	40	40	39.9	40.0	99	100	70-130	0	20	
Arsenic	ug/L	6.7	40	40	47.6	47.7	102	103	70-130	0	20	
Cadmium	ug/L	0.051J	40	40	38.7	38.5	97	96	70-130	0	20	
Chromium	ug/L	0.24J	40	40	39.2	39.1	97	97	70-130	0	20	
Selenium	ug/L	0.24J	40	40	37.9	38.7	94	96	70-130	2	20	
Thallium	ug/L	<0.036	40	40	35.5	35.5	89	89	70-130	0	20	

MATRIX SPIKE SAMPLE: 2130664

Parameter	Units	60267330010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	0.26J	40	40.5	101	70-130	
Arsenic	ug/L	88.2	40	129	101	70-130	
Cadmium	ug/L	0.099J	40	37.9	95	70-130	
Chromium	ug/L	0.43J	40	38.9	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

MATRIX SPIKE SAMPLE:		2130664					
Parameter	Units	60267330010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Selenium	ug/L	0.95J	40	35.5	86	70-130	
Thallium	ug/L	<0.036	40	35.1	88	70-130	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

QC Batch:	521303	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011		

METHOD BLANK:	2133874	Matrix:	Water
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/11/18 11:09	
Fluoride	mg/L	<0.063	0.20	0.063	04/11/18 11:09	
Sulfate	mg/L	<0.24	1.0	0.24	04/11/18 11:09	

LABORATORY CONTROL SAMPLE: 2133875

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2133876 2133877

Parameter	Units	60267330004		2133877		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Chloride	mg/L	19.9	25	25	45.9	47.4	104	110	80-120	3	15
Fluoride	mg/L	0.79	2.5	2.5	3.3	3.4	98	105	80-120	5	15
Sulfate	mg/L	51.9	25	25	77.4	77.3	102	102	80-120	0	15

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-1 **Lab ID: 60267330001** Collected: 04/03/18 08:50 Received: 04/04/18 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	0.130 ± 0.403 (0.780) C:NA T:85%	pCi/L	04/18/18 12:23	13982-63-3	
Radium-228	EPA 904.0	0.212 ± 0.539 (1.20) C:78% T:48%	pCi/L	04/19/18 11:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-2 **Lab ID: 60267330002** Collected: 04/02/18 16:30 Received: 04/04/18 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	0.0734 ± 0.335 (0.681) C:NA T:81%	pCi/L	04/18/18 12:23	13982-63-3	
Radium-228	EPA 904.0	0.362 ± 0.375 (0.773) C:76% T:70%	pCi/L	04/19/18 11:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-3 **Lab ID: 60267330003** Collected: 04/02/18 15:10 Received: 04/04/18 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	0.497 ± 0.389 (0.457) C:NA T:89%	pCi/L	04/18/18 12:23	13982-63-3	
Radium-228	EPA 904.0	0.161 ± 0.301 (0.661) C:81% T:81%	pCi/L	04/19/18 11:24	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-4 **Lab ID: 60267330004** Collected: 04/02/18 13:20 Received: 04/04/18 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	0.702 ± 0.466 (0.544) C:NA T:93%	pCi/L	04/18/18 12:23	13982-63-3	
Radium-228	EPA 904.0	1.23 ± 0.476 (0.738) C:82% T:81%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-5 **Lab ID: 60267330005** Collected: 04/02/18 12:15 Received: 04/04/18 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	0.351 ± 0.399 (0.629) C:NA T:94%	pCi/L	04/18/18 12:23	13982-63-3	
Radium-228	EPA 904.0	0.381 ± 0.349 (0.713) C:76% T:88%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-6 **Lab ID: 60267330006** Collected: 04/02/18 13:35 Received: 04/04/18 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	0.207 ± 0.407 (0.743) C:NA T:84%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	-0.0313 ± 0.320 (0.749) C:81% T:83%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-7 **Lab ID: 60267330007** Collected: 04/02/18 11:00 Received: 04/04/18 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	0.339 ± 0.401 (0.630) C:NA T:85%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	0.390 ± 0.402 (0.838) C:83% T:76%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-B1 **Lab ID: 60267330008** Collected: 04/03/18 09:05 Received: 04/04/18 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	0.507 ± 0.434 (0.589) C:NA T:94%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	1.79 ± 0.562 (0.744) C:79% T:84%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-MW-B2 **Lab ID: 60267330009** Collected: 04/02/18 16:45 Received: 04/04/18 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	0.773 ± 0.481 (0.474) C:NA T:92%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	0.911 ± 0.376 (0.594) C:83% T:89%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-DUP-1 **Lab ID: 60267330010** Collected: 04/02/18 08:00 Received: 04/04/18 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	0.297 ± 0.462 (0.800) C:NA T:80%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	-0.412 ± 0.428 (1.05) C:81% T:66%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Sample: R-FB-1 **Lab ID: 60267330011** Collected: 04/02/18 13:25 Received: 04/04/18 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	-0.129 ± 0.295 (0.694) C:NA T:89%	pCi/L	04/18/18 12:42	13982-63-3	
Radium-228	EPA 904.0	0.196 ± 0.343 (0.749) C:77% T:80%	pCi/L	04/19/18 14:45	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	100.40 %REC ± NA (NA) C:NA T:NA	pCi/L	04/18/18 12:58	13982-63-3	
Radium-228	EPA 904.0	103.21 %REC ± NA (NA) C:NA T:NA	pCi/L	04/19/18 14:45	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	109.56 %REC 8.73 RPD ± NA (NA) C:NA T:NA	pCi/L	04/18/18 12:58	13982-63-3	
Radium-228	EPA 904.0	85.15 %REC 19.17 RPD ± NA (NA) C:NA T:NA	pCi/L	04/19/18 14:45	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

QC Batch:	294201	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011, 60267330012, 60267330013		

METHOD BLANK:	1440651	Matrix:	Water
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011, 60267330012, 60267330013		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0354 ± 0.328 (0.769) C:79% T:84%	pCi/L	04/19/18 11:23	

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 RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

QC Batch:	294199	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011, 60267330012, 60267330013		

METHOD BLANK:	1440648	Matrix:	Water
Associated Lab Samples:	60267330001, 60267330002, 60267330003, 60267330004, 60267330005, 60267330006, 60267330007, 60267330008, 60267330009, 60267330010, 60267330011, 60267330012, 60267330013		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.121 ± 0.335 (0.650) C:NA T:93%	pCi/L	04/18/18 12:09	

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 RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

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.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267330001	R-MW-1	EPA 200.7	520544	EPA 200.7	520586
60267330002	R-MW-2	EPA 200.7	520544	EPA 200.7	520586
60267330003	R-MW-3	EPA 200.7	520544	EPA 200.7	520586
60267330004	R-MW-4	EPA 200.7	520544	EPA 200.7	520586
60267330005	R-MW-5	EPA 200.7	520544	EPA 200.7	520586
60267330006	R-MW-6	EPA 200.7	520544	EPA 200.7	520586
60267330007	R-MW-7	EPA 200.7	520544	EPA 200.7	520586
60267330008	R-MW-B1	EPA 200.7	520544	EPA 200.7	520586
60267330009	R-MW-B2	EPA 200.7	520544	EPA 200.7	520586
60267330010	R-DUP-1	EPA 200.7	520544	EPA 200.7	520586
60267330011	R-FB-1	EPA 200.7	520544	EPA 200.7	520586
60267330001	R-MW-1	EPA 200.8	520546	EPA 200.8	520588
60267330002	R-MW-2	EPA 200.8	520546	EPA 200.8	520588
60267330003	R-MW-3	EPA 200.8	520546	EPA 200.8	520588
60267330004	R-MW-4	EPA 200.8	520546	EPA 200.8	520588
60267330005	R-MW-5	EPA 200.8	520546	EPA 200.8	520588
60267330006	R-MW-6	EPA 200.8	520546	EPA 200.8	520588
60267330007	R-MW-7	EPA 200.8	520546	EPA 200.8	520588
60267330008	R-MW-B1	EPA 200.8	520546	EPA 200.8	520588
60267330009	R-MW-B2	EPA 200.8	520546	EPA 200.8	520588
60267330010	R-DUP-1	EPA 200.8	520546	EPA 200.8	520588
60267330011	R-FB-1	EPA 200.8	520546	EPA 200.8	520588
60267330001	R-MW-1	EPA 7470	520847	EPA 7470	520858
60267330002	R-MW-2	EPA 7470	520847	EPA 7470	520858
60267330003	R-MW-3	EPA 7470	520847	EPA 7470	520858
60267330004	R-MW-4	EPA 7470	520847	EPA 7470	520858
60267330005	R-MW-5	EPA 7470	520847	EPA 7470	520858
60267330006	R-MW-6	EPA 7470	520847	EPA 7470	520858
60267330007	R-MW-7	EPA 7470	520847	EPA 7470	520858
60267330008	R-MW-B1	EPA 7470	520847	EPA 7470	520858
60267330009	R-MW-B2	EPA 7470	520847	EPA 7470	520858
60267330010	R-DUP-1	EPA 7470	520847	EPA 7470	520858
60267330011	R-FB-1	EPA 7470	520847	EPA 7470	520858
60267330001	R-MW-1	EPA 903.1	294199		
60267330002	R-MW-2	EPA 903.1	294199		
60267330003	R-MW-3	EPA 903.1	294199		
60267330004	R-MW-4	EPA 903.1	294199		
60267330005	R-MW-5	EPA 903.1	294199		
60267330006	R-MW-6	EPA 903.1	294199		
60267330007	R-MW-7	EPA 903.1	294199		
60267330008	R-MW-B1	EPA 903.1	294199		
60267330009	R-MW-B2	EPA 903.1	294199		
60267330010	R-DUP-1	EPA 903.1	294199		
60267330011	R-FB-1	EPA 903.1	294199		
60267330012	R-MW-4 MS	EPA 903.1	294199		
60267330013	R-MW-4 MSD	EPA 903.1	294199		
60267330001	R-MW-1	EPA 904.0	294201		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ASSESSMENT

Pace Project No.: 60267330

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267330002	R-MW-2	EPA 904.0	294201		
60267330003	R-MW-3	EPA 904.0	294201		
60267330004	R-MW-4	EPA 904.0	294201		
60267330005	R-MW-5	EPA 904.0	294201		
60267330006	R-MW-6	EPA 904.0	294201		
60267330007	R-MW-7	EPA 904.0	294201		
60267330008	R-MW-B1	EPA 904.0	294201		
60267330009	R-MW-B2	EPA 904.0	294201		
60267330010	R-DUP-1	EPA 904.0	294201		
60267330011	R-FB-1	EPA 904.0	294201		
60267330012	R-MW-4 MS	EPA 904.0	294201		
60267330013	R-MW-4 MSD	EPA 904.0	294201		
60267330001	R-MW-1	EPA 300.0	521303		
60267330002	R-MW-2	EPA 300.0	521303		
60267330003	R-MW-3	EPA 300.0	521303		
60267330004	R-MW-4	EPA 300.0	521303		
60267330005	R-MW-5	EPA 300.0	521303		
60267330006	R-MW-6	EPA 300.0	521303		
60267330007	R-MW-7	EPA 300.0	521303		
60267330008	R-MW-B1	EPA 300.0	521303		
60267330009	R-MW-B2	EPA 300.0	521303		
60267330010	R-DUP-1	EPA 300.0	521303		
60267330011	R-FB-1	EPA 300.0	521303		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60267330
Barcode with number 60267330

Client Name: Golder

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

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

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

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

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

Cooler Temperature (°C): As-read 9.2/10.9 Corr. Factor +0.2 Corrected 9.4/11.1/0.8 Date and initials of person examining contents: [Signature] 4/4/18

Temperature should be above freezing to 6°C 0.6

Table with 3 columns: Question, Yes/No/N/A checkboxes, and Notes. Rows include Chain of Custody, Short Hold Time, Rush Turn Around Time, Sufficient volume, Containers used, Containers intact, Unpreserved soils, Filtered volume, Sample labels match, Samples contain multiple phases, Containers requiring pH preservation, Cyanide water sample checks, 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: [Signature] Date: 4/4/18



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

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

Company: **Golder Associates** Report To: **Mark Haddock (mhaddock@golder.com)** Attention:

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

St Charles, MO 63301 **Ryan Feldmann** Address:

Email To: **mhaddock@golder.com** Purchase Order No.: Project Name: **Ameren Rush Island Energy Ctr Assessment** Site Location: **MO**

Phone: **636-724-9191** Fax: **636-724-9323** Project Profile #: **9285** STATE:

Requested Due Date/TAT: **Standard** Project Number: **153-1406.0002**

ITEM #	Section D Required Client Information	Valid Matrix Codes	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (O=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	UNPRESERVED	PRESERVATIVES	Requested Analysis Filtered (Y/N)						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.	
					DATE	TIME				DATE	TIME	Y	N	N	N			N
1	R-MW-1	DRINKING WATER DW	WT	G	4/3/18	0850	4	1	3								2(BRN) (BRN BP2)	01
2	R-MW-2	WATER WT	WT	G	4/2/18	1615	1	1	1									02
3	R-MW-3	WASTE WATER WW	WT	G		1510												03
4	R-MW-4	WASTE WATER PRODUCT F	WT	G		1520	12	3	9								6(BRN) (BRN BP2)	04
5	R-MW-5	SOIL/SOLID SL	WT	G		1215	4	4	3								2(BRN) (BRN BP2)	05
6	R-MW-6	SOIL OIL	WT	G		1335												06
7	R-MW-7	WASTE WATER WW	WT	G		1100												07
8	R-MW-B1	WASTE WATER WW	WT	G	4/3/18	0905												08
9	R-MW-B2	WASTE WATER WW	WT	G	4/2/18	1645												09
10	R-DUP-1	WASTE WATER WW	WT	G														10
11	R-FB-1	WASTE WATER WW	WT	G		1325												11
12		WASTE WATER WW	WT	G														

ADDITIONAL COMMENTS

Handwritten notes: 4/3-18 1630 [Signature] PAS 4/2/18 1630, 4/3/18 170 [Signature] PAS 4/1/18 0845

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)

9.4 Y Y Y

11.1 Y Y Y

0.0 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **Ryan Feldmann** DATE Signed (MM/DD/YYYY): **04/03/18**

SIGNATURE OF SAMPLER: *[Signature]*

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

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

MEMORANDUM**DATE** April 27, 2018**Project No.** 1531406**TO** Project File
Golder Associates**CC** Amanda Derhake, Jeff Ingram**FROM** Tommy Goodwin**EMAIL** Tommy_Goodwin@golder.com**DATA VALIDATION SUMMARY, RUSH ISLAND ENERGY CENTER– AMEREN GROUNDWATER – DATA PACKAGE 60267330**

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).
- When a field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren-Rush Island - Assessment
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406.0002 E
 Validation Date: 4/27/2018

Laboratory: Pace Analytical SDG #: 60267330
 Analytical Method (type and no.): 200.7 Metals & Diss., 200.8 MET ICPMS & Diss., 7470 Hg, 903.1 & 904.0 Rads, 300.0 Anions
 Matrix: Air Soil/Sed. Water Waste
 Sample Names R-MW-1, R-MW-2, R-MW-3, R-MW-4, R-MW-5, R-MW-6, R-MW-7, R-MW-B1, R-MW-B2,
R-DUP-1, R-FB-1, R-MW-4 MS, R-MW-4 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"/>	<u>4/2 - 4/3/18</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Chloride, Sulfate</u>
g) Were any matrix problems noted?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Bc(0.20), Fe(8.1), Sb(0.089), Cd(0.030), Se(0.087)</u>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Sb(0.091), Cd(0.028), Cr(0.064), Se(0.15)</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@ RI-MW-3</u>
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>FB-1@ R-MW-6</u>
b) Were field dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Pb(20.0), Cd(20.0), Ra226(50.4)</u>
c) Were lab duplicates analyzed (note original and duplicate samples)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
d) Were lab dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
R-MW-1	Chloride	19.3	D	Dilution factor (DF) of 2
	Sulfate	280	D	L 20
	Iron (Fe)	50.0	U	Detected in Blank; PQL > Result > MDL
	Cadmium (Cd)	0.50	U	L L
R-MW-2	L	0.50	U	
	Chloride	27.6	D	DF of 2
	Sulfate	267	D	L 20
R-MW-3	Chloride	29.9	D	L 2
	Sulfate	192	D	L 20
	Lead (Pb)	4.0	J	RPD exceeded limits; Result > MDL
	Radium-226	0.497	J	L ; Result > MDC
	Antimony (Sb)	1.0	U	Blank; PQL > Result > MDL
	Cd	0.50	U	
	Selenium (Se)	1.0	U	
R-MW-4	Sb	1.0	U	
	Cd	0.50	U	
	Se	1.0	U	
	Chloride	19.9	D	DF of 5
	Sulfate	51.9	D	L L
R-MW-5	Beryllium (Be)	1.0	U	Blank; PQL > Result > MDL
	Sb	1.0	U	
	Cd	0.50	U	
	Se	1.0	U	
R-MW-6	Sb	1.0	U	
	Cd	0.50	U	
	Chromium (Cr)	1.0	U	
	Se	1.0	U	L
	Sulfate	32.4	D	DF of 2
R	<u>Continued on Next Page</u>			

Signature: Tommy J. Wood

Date: 4/27/18

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
R-MW-7	Sb	1.0	U	Blank ; PQL > Result > MDL
	Cd	0.50	U	
	Se	1.0	U	
	Sulfate	89.3	D	DF of 5
R-MW-B1	Chloride	43.9	D	5
	Sulfate	44.1	D	5
	Sb	1.0	U	Blank ; PQL > Result > MDL
	Cd	0.50	U	
	Se	1.0	U	
R-MW-B2	Sb	1.0	U	
	Cd	0.50	U	
	Se	1.0	U	
	Chloride	51.8	D	DF of 5
R-DUP-1	Chloride	30.3	D	10
	Sulfate	198	D	10
	Pb	3.0	UJ	RPD exceeded limits ; MDL > Result
	Ra-226	0.800	UJ	; > Result
	Sb	1.0	U	Blank ; PQL > Result > MDL
	Cd	0.50	U	
R-FB-1	Sb	1.0	U	
	Cd	0.50	U	
	Se	1.0	U	
<div style="position: relative; width: 100%; height: 100%; border: 1px solid black;"> <div style="position: absolute; top: 0; left: 0; right: 0; bottom: 0; border-bottom: 1px solid black;"> <div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); font-size: 2em; opacity: 0.3;">TR</div> </div> </div>				

Signature: Tommy Good

Date: 4/27/2018

June 26, 2018

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

RE: Project: AMEREN RUSH ISLAND ENERGY CTR
Pace Project No.: 60271349

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on May 26, 2018. 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, 6/26/18: Additional Metals added to 200.7 list per client request.

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

Sincerely,



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

Enclosures

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



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
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 #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991

Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Ormond Beach Certification IDs

8 East Tower Circle, Ormond Beach, FL 32174
Alabama Certification #: 41320
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
Wyoming Certification: FL NELAC Reciprocity
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

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

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60271349001	R-MW-1	Water	05/24/18 15:40	05/26/18 02:55
60271349002	R-MW-2	Water	05/24/18 14:20	05/26/18 02:55
60271349003	R-MW-3	Water	05/24/18 12:55	05/26/18 02:55
60271349004	R-MW-4	Water	05/24/18 10:50	05/26/18 02:55
60271349005	R-MW-5	Water	05/24/18 09:15	05/26/18 02:55
60271349006	R-MW-6	Water	05/25/18 10:50	05/26/18 02:55
60271349007	R-MW-7	Water	05/25/18 10:20	05/26/18 02:55
60271349008	R-MW-B1	Water	05/24/18 15:25	05/26/18 02:55
60271349009	R-MW-B2	Water	05/24/18 14:05	05/26/18 02:55
60271349010	R-DUP-1	Water	05/24/18 14:05	05/26/18 02:55
60271349011	R-FB-1	Water	05/25/18 09:55	05/26/18 02:55
60271349012	R-MW-4 MS	Water	05/24/18 10:50	05/26/18 02:55
60271349013	R-MW-4 MSD	Water	05/24/18 10:50	05/26/18 02:55

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60271349001	R-MW-1	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
60271349002	R-MW-2	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60271349003	R-MW-3	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271349004	R-MW-4	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271349005	R-MW-5	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271349006	R-MW-6	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60271349007	R-MW-7	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
60271349008	R-MW-B1	SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	AGO	10	PASI-K
60271349009	R-MW-B2	EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
		EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60271349010	R-DUP-1	SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
		EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL, WNM	3	PASI-K
60271349011	R-FB-1	EPA 200.7	AGO	10	PASI-K
		EPA 200.8	KPP	3	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		EPA 300.0	OL	3	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60271349012	R-MW-4 MS	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60271349013	R-MW-4 MSD	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-1 **Lab ID: 60271349001** Collected: 05/24/18 15:40 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	17.0	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 15:42	7440-39-3	
Boron	1960	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 15:42	7440-42-8	
Calcium	26900	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 15:42	7440-70-2	
Iron	14.0J	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 15:42	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 15:42	7439-93-2	
Magnesium	647	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 15:42	7439-95-4	
Manganese	5.3	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 15:42	7439-96-5	
Molybdenum	54.0	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 15:42	7439-98-7	
Potassium	6120	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 15:42	7440-09-7	
Sodium	117000	ug/L	500	157	1	05/31/18 11:50	06/01/18 15:42	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	0.95J	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 03:37	7440-36-0	
Arsenic	17.1	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 03:37	7440-38-2	
Selenium	4.1	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 03:37	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	57.7	mg/L	20.0	4.9	1		06/06/18 16:36		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	477	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	20.1	mg/L	2.0	0.92	2		06/09/18 10:22	16887-00-6	
Fluoride	0.39	mg/L	0.20	0.063	1		06/07/18 23:08	16984-48-8	
Sulfate	261	mg/L	20.0	4.7	20		06/07/18 23:23	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-2 **Lab ID: 60271349002** Collected: 05/24/18 14:20 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	10.0	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 15:44	7440-39-3	
Boron	2990	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 15:44	7440-42-8	
Calcium	8940	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 15:44	7440-70-2	
Iron	134	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 15:44	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 15:44	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 15:44	7439-95-4	
Manganese	7.0	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 15:44	7439-96-5	
Molybdenum	202	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 15:44	7439-98-7	
Potassium	3080	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 15:44	7440-09-7	
Sodium	233000	ug/L	500	157	1	05/31/18 11:50	06/01/18 15:44	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	4.0	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:19	7440-36-0	
Arsenic	211	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:19	7440-38-2	
Selenium	0.84J	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:19	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	185	mg/L	20.0	4.9	1		06/06/18 16:40		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	781	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	25.1	mg/L	2.0	0.92	2		06/08/18 13:18	16887-00-6	
Fluoride	0.82	mg/L	0.20	0.063	1		06/08/18 13:03	16984-48-8	
Sulfate	293	mg/L	50.0	11.8	50		06/08/18 16:34	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-3 **Lab ID: 60271349003** Collected: 05/24/18 12:55 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	13.2	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 15:47	7440-39-3	
Boron	14700	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 15:47	7440-42-8	
Calcium	6030	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 15:47	7440-70-2	
Iron	246	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 15:47	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 15:47	7439-93-2	
Magnesium	42.7J	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 15:47	7439-95-4	
Manganese	7.3	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 15:47	7439-96-5	
Molybdenum	759	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 15:47	7439-98-7	
Potassium	1690	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 15:47	7440-09-7	
Sodium	253000	ug/L	500	157	1	05/31/18 11:50	06/01/18 15:47	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:22	7440-36-0	
Arsenic	96.6	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:22	7440-38-2	
Selenium	0.59J	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:22	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	348	mg/L	20.0	4.9	1		06/06/18 16:45		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	764	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	31.2	mg/L	2.0	0.92	2		06/10/18 10:30	16887-00-6	
Fluoride	0.78	mg/L	0.20	0.063	1		06/09/18 12:31	16984-48-8	
Sulfate	194	mg/L	20.0	4.7	20		06/10/18 10:45	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-4 **Lab ID: 60271349004** Collected: 05/24/18 10:50 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	283	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 15:49	7440-39-3	
Boron	4240	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 15:49	7440-42-8	M1
Calcium	71400	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 15:49	7440-70-2	M1
Iron	5330	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 15:49	7439-89-6	
Lithium	47.8	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 15:49	7439-93-2	
Magnesium	14300	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 15:49	7439-95-4	
Manganese	275	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 15:49	7439-96-5	
Molybdenum	90.0	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 15:49	7439-98-7	
Potassium	4900	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 15:49	7440-09-7	
Sodium	59100	ug/L	500	157	1	05/31/18 11:50	06/01/18 15:49	7440-23-5	M1
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:25	7440-36-0	
Arsenic	7.2	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:25	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:25	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	276	mg/L	20.0	4.9	1		06/06/18 16:50		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	428	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	19.9	mg/L	2.0	0.92	2		06/10/18 11:00	16887-00-6	
Fluoride	0.79	mg/L	0.20	0.063	1		06/09/18 12:46	16984-48-8	
Sulfate	48.0	mg/L	5.0	1.2	5		06/10/18 12:14	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-5 **Lab ID: 60271349005** Collected: 05/24/18 09:15 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	371	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 15:55	7440-39-3	
Boron	108	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 15:55	7440-42-8	
Calcium	124000	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 15:55	7440-70-2	
Iron	10900	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 15:55	7439-89-6	
Lithium	5.3J	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 15:55	7439-93-2	
Magnesium	16900	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 15:55	7439-95-4	
Manganese	411	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 15:55	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 15:55	7439-98-7	
Potassium	2060	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 15:55	7440-09-7	
Sodium	4510	ug/L	500	157	1	05/31/18 11:50	06/01/18 15:55	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:33	7440-36-0	
Arsenic	3.8	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:33	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:33	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	384	mg/L	20.0	4.9	1		06/06/18 17:01		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	435	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	6.1	mg/L	1.0	0.46	1		06/09/18 14:15	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.063	1		06/09/18 14:15	16984-48-8	
Sulfate	12.9	mg/L	1.0	0.24	1		06/09/18 14:15	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-6 **Lab ID: 60271349006** Collected: 05/25/18 10:50 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	123	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:02	7440-39-3	
Boron	546	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:02	7440-42-8	
Calcium	82200	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:02	7440-70-2	
Iron	377	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:02	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:02	7439-93-2	
Magnesium	12000	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:02	7439-95-4	
Manganese	72.9	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:02	7439-96-5	
Molybdenum	1.5J	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:02	7439-98-7	
Potassium	1100	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:02	7440-09-7	
Sodium	10900	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:02	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:36	7440-36-0	
Arsenic	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:36	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:36	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	259	mg/L	20.0	4.9	1		06/06/18 17:53		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	326	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	4.2	mg/L	1.0	0.46	1		06/09/18 14:30	16887-00-6	
Fluoride	0.22	mg/L	0.20	0.063	1		06/09/18 14:30	16984-48-8	
Sulfate	31.0	mg/L	2.0	0.47	2		06/11/18 14:24	14808-79-8	M1

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-7 **Lab ID: 60271349007** Collected: 05/25/18 10:20 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	305	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:04	7440-39-3	
Boron	2390	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:04	7440-42-8	
Calcium	72300	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:04	7440-70-2	
Iron	15800	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:04	7439-89-6	
Lithium	35.1	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:04	7439-93-2	
Magnesium	19400	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:04	7439-95-4	
Manganese	312	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:04	7439-96-5	
Molybdenum	187	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:04	7439-98-7	
Potassium	5280	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:04	7440-09-7	
Sodium	28700	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:04	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:38	7440-36-0	
Arsenic	91.6	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:38	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:38	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	235	mg/L	20.0	4.9	1		06/06/18 17:58		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	405	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	15.3	mg/L	1.0	0.46	1		06/09/18 14:45	16887-00-6	
Fluoride	0.35	mg/L	0.20	0.063	1		06/09/18 14:45	16984-48-8	
Sulfate	89.5	mg/L	10.0	2.4	10		06/11/18 15:33	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-B1 **Lab ID: 60271349008** Collected: 05/24/18 15:25 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	456	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:07	7440-39-3	
Boron	115	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:07	7440-42-8	
Calcium	145000	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:07	7440-70-2	
Iron	23900	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:07	7439-89-6	
Lithium	61.9	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:07	7439-93-2	
Magnesium	45500	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:07	7439-95-4	
Manganese	1080	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:07	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:07	7439-98-7	
Potassium	9040	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:07	7440-09-7	
Sodium	24900	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:07	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:41	7440-36-0	
Arsenic	20.4	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:41	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:41	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	539	mg/L	20.0	4.9	1		06/06/18 17:07		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	672	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	49.4	mg/L	5.0	2.3	5		06/10/18 13:44	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.063	1		06/09/18 15:00	16984-48-8	
Sulfate	39.0	mg/L	5.0	1.2	5		06/10/18 13:44	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-B2 **Lab ID: 60271349009** Collected: 05/24/18 14:05 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	419	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:09	7440-39-3	
Boron	44.2J	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:09	7440-42-8	
Calcium	107000	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:09	7440-70-2	
Iron	9290	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:09	7439-89-6	
Lithium	9.3J	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:09	7439-93-2	
Magnesium	19400	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:09	7439-95-4	
Manganese	236	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:09	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:09	7439-98-7	
Potassium	1960	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:09	7440-09-7	
Sodium	23400	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:09	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:44	7440-36-0	
Arsenic	2.1	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:44	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:44	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	338	mg/L	20.0	4.9	1		06/06/18 17:20		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	474	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	46.3	mg/L	5.0	2.3	5		06/12/18 13:59	16887-00-6	
Fluoride	0.18J	mg/L	0.20	0.063	1		06/09/18 15:15	16984-48-8	
Sulfate	17.0	mg/L	1.0	0.24	1		06/09/18 15:15	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-DUP-1 **Lab ID: 60271349010** Collected: 05/24/18 14:05 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	361	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:11	7440-39-3	
Boron	87.7J	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:11	7440-42-8	
Calcium	121000	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:11	7440-70-2	
Iron	10600	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:11	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:11	7439-93-2	
Magnesium	16700	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:11	7439-95-4	
Manganese	406	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:11	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:11	7439-98-7	
Potassium	2030	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:11	7440-09-7	
Sodium	4420	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:11	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:52	7440-36-0	
Arsenic	3.4	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:52	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:52	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	391	mg/L	20.0	4.9	1		06/06/18 17:26		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	411	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	6.1	mg/L	1.0	0.46	1		06/09/18 15:30	16887-00-6	
Fluoride	0.16J	mg/L	0.20	0.063	1		06/09/18 15:30	16984-48-8	
Sulfate	13.1	mg/L	1.0	0.24	1		06/09/18 15:30	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-FB-1 **Lab ID: 60271349011** Collected: 05/25/18 09:55 Received: 05/26/18 02:55 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Barium	<1.5	ug/L	5.0	1.5	1	05/31/18 11:50	06/01/18 16:13	7440-39-3	
Boron	<12.5	ug/L	100	12.5	1	05/31/18 11:50	06/01/18 16:13	7440-42-8	
Calcium	<53.5	ug/L	200	53.5	1	05/31/18 11:50	06/01/18 16:13	7440-70-2	
Iron	<6.1	ug/L	50.0	6.1	1	05/31/18 11:50	06/01/18 16:13	7439-89-6	
Lithium	<4.6	ug/L	10.0	4.6	1	05/31/18 11:50	06/01/18 16:13	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	05/31/18 11:50	06/01/18 16:13	7439-95-4	
Manganese	<0.73	ug/L	5.0	0.73	1	05/31/18 11:50	06/01/18 16:13	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	05/31/18 11:50	06/01/18 16:13	7439-98-7	
Potassium	<79.3	ug/L	500	79.3	1	05/31/18 11:50	06/01/18 16:13	7440-09-7	
Sodium	<157	ug/L	500	157	1	05/31/18 11:50	06/01/18 16:13	7440-23-5	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:55	7440-36-0	
Arsenic	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:55	7440-38-2	
Selenium	<0.50	ug/L	1.0	0.50	1	06/13/18 00:42	06/14/18 04:55	7782-49-2	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<4.9	mg/L	20.0	4.9	1		06/06/18 18:01		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		05/31/18 14:20		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.46	mg/L	1.0	0.46	1		06/09/18 15:45	16887-00-6	
Fluoride	<0.063	mg/L	0.20	0.063	1		06/09/18 15:45	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		06/09/18 15:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch:	528052	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011		

METHOD BLANK:	2163156	Matrix:	Water
Associated Lab Samples:	60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	06/01/18 15:09	
Boron	ug/L	<12.5	100	12.5	06/01/18 15:09	
Calcium	ug/L	<53.5	200	53.5	06/01/18 15:09	
Iron	ug/L	<6.1	50.0	6.1	06/01/18 15:09	
Lithium	ug/L	<4.6	10.0	4.6	06/01/18 15:09	
Magnesium	ug/L	<14.0	50.0	14.0	06/01/18 15:09	
Manganese	ug/L	<0.73	5.0	0.73	06/01/18 15:09	
Molybdenum	ug/L	<0.90	20.0	0.90	06/01/18 15:09	
Potassium	ug/L	<79.3	500	79.3	06/01/18 15:09	
Sodium	ug/L	<157	500	157	06/01/18 15:09	

LABORATORY CONTROL SAMPLE: 2163157

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	995	99	85-115	
Boron	ug/L	1000	967	97	85-115	
Calcium	ug/L	10000	9510	95	85-115	
Iron	ug/L	10000	9820	98	85-115	
Lithium	ug/L	1000	1020	102	85-115	
Magnesium	ug/L	10000	9680	97	85-115	
Manganese	ug/L	1000	937	94	85-115	
Molybdenum	ug/L	1000	1020	102	85-115	
Potassium	ug/L	10000	9740	97	85-115	
Sodium	ug/L	10000	10200	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163158 2163159

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
		60271049001 Result	Spike Conc.	Spike Conc.	MS Result							MSD Result
Barium	ug/L	193	1000	1000	1200	1170	101	98	70-130	3	20	
Boron	ug/L	3780	1000	1000	4740	4660	96	88	70-130	2	20	
Calcium	ug/L	162000	10000	10000	174000	168000	118	66	70-130	3	20	M1
Iron	ug/L	7040	10000	10000	16800	16400	97	94	70-130	2	20	
Lithium	ug/L	21.7	1000	1000	1080	1060	106	104	70-130	2	20	
Magnesium	ug/L	29700	10000	10000	38800	38100	91	84	70-130	2	20	
Manganese	ug/L	1680	1000	1000	2640	2590	96	91	70-130	2	20	
Molybdenum	ug/L	3.9J	1000	1000	1060	1050	106	105	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163158												2163159	
Parameter	Units	60271049001 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Potassium	ug/L	5340	10000	10000	15500	15100	102	97	70-130	3	20		
Sodium	ug/L	9220	10000	10000	19900	19300	107	101	70-130	3	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163160												2163161	
Parameter	Units	60271349004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Barium	ug/L	283	1000	1000	1300	1260	101	97	70-130	3	20		
Boron	ug/L	4240	1000	1000	4930	4770	69	53	70-130	3	20	M1	
Calcium	ug/L	71400	10000	10000	78900	76600	74	51	70-130	3	20	M1	
Iron	ug/L	5330	10000	10000	15200	14700	98	94	70-130	3	20		
Lithium	ug/L	47.8	1000	1000	1100	1070	106	102	70-130	3	20		
Magnesium	ug/L	14300	10000	10000	23000	22100	87	78	70-130	4	20		
Manganese	ug/L	275	1000	1000	1200	1150	92	88	70-130	4	20		
Molybdenum	ug/L	90.0	1000	1000	1140	1100	105	101	70-130	4	20		
Potassium	ug/L	4900	10000	10000	14900	14500	100	96	70-130	3	20		
Sodium	ug/L	59100	10000	10000	67200	65400	82	64	70-130	3	20	M1	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR
Pace Project No.: 60271349

QC Batch: 454029 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011

METHOD BLANK: 2459627 Matrix: Water
Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.50	1.0	0.50	06/14/18 03:29	
Arsenic	ug/L	<0.50	1.0	0.50	06/14/18 03:29	
Selenium	ug/L	<0.50	1.0	0.50	06/14/18 03:29	

LABORATORY CONTROL SAMPLE: 2459628

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	50	50.3	101	85-115	
Arsenic	ug/L	50	50.9	102	85-115	
Selenium	ug/L	50	52.1	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2459629 2459630

Parameter	Units	60271349004		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result							
Antimony	ug/L	<0.50	50	50	52.7	53.8	105	108	70-130	2	20		
Arsenic	ug/L	7.2	50	50	60.6	62.0	107	110	70-130	2	20		
Selenium	ug/L	<0.50	50	50	54.1	55.1	108	110	70-130	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2459631 2459632

Parameter	Units	60272282002		MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result							
Antimony	ug/L	<0.50	50	50	51.2	52.8	102	105	70-130	3	20		
Arsenic	ug/L	<0.50	50	50	52.2	53.6	104	107	70-130	3	20		
Selenium	ug/L	<0.50	50	50	53.7	54.2	107	108	70-130	1	20		

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 528701 Analysis Method: SM 2320B
 QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
 Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007,
 60271349008, 60271349009, 60271349010, 60271349011

METHOD BLANK: 2165835 Matrix: Water
 Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007,
 60271349008, 60271349009, 60271349010, 60271349011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	06/06/18 16:26	

LABORATORY CONTROL SAMPLE: 2165836

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	506	101	90-110	

SAMPLE DUPLICATE: 2165839

Parameter	Units	60271349004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	276	277	1	10	

SAMPLE DUPLICATE: 2165840

Parameter	Units	60271550003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	396	404	2	10	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 527980

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349008, 60271349009, 60271349010

METHOD BLANK: 2162963

Matrix: Water

Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349008, 60271349009, 60271349010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	06/04/18 11:22	

LABORATORY CONTROL SAMPLE: 2162964

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

SAMPLE DUPLICATE: 2162965

Parameter	Units	60271331001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1060	1060	0	10	

SAMPLE DUPLICATE: 2162966

Parameter	Units	60271349004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	428	0	10	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 527983

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60271349006, 60271349007, 60271349011

METHOD BLANK: 2162971

Matrix: Water

Associated Lab Samples: 60271349006, 60271349007, 60271349011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/31/18 14:20	

LABORATORY CONTROL SAMPLE: 2162972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	990	99	80-120	

SAMPLE DUPLICATE: 2162973

Parameter	Units	60271393012 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	533	536	1	10	

SAMPLE DUPLICATE: 2162974

Parameter	Units	60271426001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1000	1010	1	10	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 529035	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60271349001	

METHOD BLANK: 2167256 Matrix: Water
Associated Lab Samples: 60271349001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.063	0.20	0.063	06/07/18 15:41	
Sulfate	mg/L	<0.24	1.0	0.24	06/07/18 15:41	

LABORATORY CONTROL SAMPLE: 2167257

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2167258 2167259

Parameter	Units	60271292003		2167258		2167259		% Rec Limits	RPD	Max RPD	Qual	
		MS Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec					MSD % Rec
Fluoride	mg/L	ND	25	25	24.8	25.0	96	97	90-110	1	15	
Sulfate	mg/L	80.2	50	50	131	132	102	103	90-110	1	15	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 529142	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60271349002	

METHOD BLANK: 2167834 Matrix: Water
Associated Lab Samples: 60271349002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/08/18 09:35	
Fluoride	mg/L	<0.063	0.20	0.063	06/08/18 09:35	
Sulfate	mg/L	0.28J	1.0	0.24	06/08/18 09:35	

LABORATORY CONTROL SAMPLE: 2167835

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.4	95	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2167836 2167837

Parameter	Units	60271328001 Result	MS		MSD		MS		MSD		% Rec Limits	Max RPD	Qual
			Spike Conc.	MS Result	MSD Result	% Rec	% Rec						
Fluoride	mg/L	ND	2.5	2.5	2.7	2.7	101	100	90-110	1	15		

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR
Pace Project No.: 60271349

QC Batch: 529291 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011

METHOD BLANK: 2168473 Matrix: Water
Associated Lab Samples: 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/09/18 09:01	
Fluoride	mg/L	<0.063	0.20	0.063	06/09/18 09:01	
Sulfate	mg/L	<0.24	1.0	0.24	06/09/18 09:01	

LABORATORY CONTROL SAMPLE: 2168474

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2168475 2168476

Parameter	Units	60271349004		2168476		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result						
Fluoride	mg/L	0.79	2.5	2.5	3.4	3.4	103	104	90-110	1	15

MATRIX SPIKE SAMPLE: 2168477

Parameter	Units	60270840003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	387	250	627	96	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 529292

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60271349001

METHOD BLANK: 2168478

Matrix: Water

Associated Lab Samples: 60271349001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/09/18 08:57	

LABORATORY CONTROL SAMPLE: 2168479

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 529310 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60271349003, 60271349004, 60271349008

METHOD BLANK: 2168703 Matrix: Water

Associated Lab Samples: 60271349003, 60271349004, 60271349008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/10/18 09:21	
Sulfate	mg/L	<0.24	1.0	0.24	06/10/18 09:21	

LABORATORY CONTROL SAMPLE: 2168704

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2168705 2168706

Parameter	Units	60271349004		2168705		2168706		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	19.9	10	10	30.5	30.3	106	104	90-110	1	15
Sulfate	mg/L	48.0	25	25	73.9	73.7	104	103	90-110	0	15

MATRIX SPIKE SAMPLE: 2168707

Parameter	Units	60271727001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	28.0	10	38.5	106	90-110	
Sulfate	mg/L	284	100	389	105	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch:	529343	Analysis Method:	EPA 300.0
QC Batch Method:	EPA 300.0	Analysis Description:	300.0 IC Anions
Associated Lab Samples:	60271349006, 60271349007		

METHOD BLANK: 2168792 Matrix: Water
Associated Lab Samples: 60271349006, 60271349007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	06/11/18 13:16	

LABORATORY CONTROL SAMPLE: 2168793

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: 2168794 2168795

Parameter	Units	60271349006		2168795		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Sulfate	mg/L	31.0	10	42.6	10	116	116	90-110	0	15	E,M1

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 529570

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60271349009

METHOD BLANK: 2169422

Matrix: Water

Associated Lab Samples: 60271349009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/12/18 10:39	

LABORATORY CONTROL SAMPLE: 2169423

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

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-1 **Lab ID: 60271349001** Collected: 05/24/18 15:40 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.319 ± 0.517 (0.900) C:NA T:88%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.0628 ± 0.359 (0.821) C:76% T:84%	pCi/L	06/19/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-2 **Lab ID: 60271349002** Collected: 05/24/18 14:20 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.000 ± 0.356 (0.752) C:NA T:98%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.0348 ± 0.344 (0.797) C:77% T:78%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-3 **Lab ID: 60271349003** Collected: 05/24/18 12:55 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	-0.125 ± 0.285 (0.671) C:NA T:82%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.114 ± 0.464 (1.05) C:72% T:80%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-4 **Lab ID: 60271349004** Collected: 05/24/18 10:50 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.162 ± 0.351 (0.647) C:NA T:92%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.169 ± 0.408 (0.909) C:70% T:82%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-5 **Lab ID: 60271349005** Collected: 05/24/18 09:15 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.799 ± 0.578 (0.805) C:NA T:94%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	1.03 ± 0.479 (0.817) C:74% T:89%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-6 **Lab ID: 60271349006** Collected: 05/25/18 10:50 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.0478 ± 0.311 (0.627) C:NA T:102%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.309 ± 0.405 (0.861) C:71% T:80%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-7 **Lab ID: 60271349007** Collected: 05/25/18 10:20 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.796 ± 0.607 (0.864) C:NA T:85%	pCi/L	06/20/18 10:32	13982-63-3	
Radium-228	EPA 904.0	0.640 ± 0.442 (0.851) C:72% T:84%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-B1 **Lab ID: 60271349008** Collected: 05/24/18 15:25 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.266 ± 0.377 (0.639) C:NA T:93%	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	1.22 ± 0.510 (0.815) C:72% T:88%	pCi/L	06/19/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-B2 **Lab ID: 60271349009** Collected: 05/24/18 14:05 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.710 ± 0.563 (0.820) C:NA T:91%	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	0.608 ± 0.396 (0.745) C:75% T:84%	pCi/L	06/19/18 15:55	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-DUP-1 **Lab ID: 60271349010** Collected: 05/24/18 14:05 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.461 ± 0.463 (0.722) C:NA T:100%	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	0.737 ± 0.468 (0.879) C:70% T:82%	pCi/L	06/19/18 15:55	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-FB-1 **Lab ID: 60271349011** Collected: 05/25/18 09:55 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.121 ± 0.291 (0.562) C:NA T:86%	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	-0.403 ± 0.338 (0.862) C:71% T:91%	pCi/L	06/19/18 15:55	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Sample: R-MW-4 MS **Lab ID: 60271349012** Collected: 05/24/18 10:50 Received: 05/26/18 02:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	115.32 %REC ± NA (NA) C:NA T:NA	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	75.08 %REC ± NA (NA) C:NA T:NA	pCi/L	06/19/18 15:55	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	102.87 %REC 11.42 RPD ± NA (NA) C:NA T:NA	pCi/L	06/20/18 10:46	13982-63-3	
Radium-228	EPA 904.0	76.22 %REC 1.50 RPD ± NA (NA) C:NA T:NA	pCi/L	06/19/18 15:54	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch:	301377	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011, 60271349012, 60271349013		

METHOD BLANK:	1474534	Matrix:	Water
Associated Lab Samples:	60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007, 60271349008, 60271349009, 60271349010, 60271349011, 60271349012, 60271349013		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.176 ± 0.336 (0.739) C:74% T:82%	pCi/L	06/19/18 15:53	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

QC Batch: 301351 Analysis Method: EPA 903.1
 QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
 Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007,
 60271349008, 60271349009, 60271349010, 60271349011, 60271349012, 60271349013

METHOD BLANK: 1474496 Matrix: Water
 Associated Lab Samples: 60271349001, 60271349002, 60271349003, 60271349004, 60271349005, 60271349006, 60271349007,
 60271349008, 60271349009, 60271349010, 60271349011, 60271349012, 60271349013

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.320 ± 0.393 (0.640) C:NA T:94%	pCi/L	06/20/18 10:32	

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QUALIFIERS

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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-O Pace Analytical Services - Ormond Beach

PASI-PA Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271349001	R-MW-1	EPA 200.7	528052	EPA 200.7	528111
60271349002	R-MW-2	EPA 200.7	528052	EPA 200.7	528111
60271349003	R-MW-3	EPA 200.7	528052	EPA 200.7	528111
60271349004	R-MW-4	EPA 200.7	528052	EPA 200.7	528111
60271349005	R-MW-5	EPA 200.7	528052	EPA 200.7	528111
60271349006	R-MW-6	EPA 200.7	528052	EPA 200.7	528111
60271349007	R-MW-7	EPA 200.7	528052	EPA 200.7	528111
60271349008	R-MW-B1	EPA 200.7	528052	EPA 200.7	528111
60271349009	R-MW-B2	EPA 200.7	528052	EPA 200.7	528111
60271349010	R-DUP-1	EPA 200.7	528052	EPA 200.7	528111
60271349011	R-FB-1	EPA 200.7	528052	EPA 200.7	528111
60271349001	R-MW-1	EPA 200.8	454029	EPA 200.8	454047
60271349002	R-MW-2	EPA 200.8	454029	EPA 200.8	454047
60271349003	R-MW-3	EPA 200.8	454029	EPA 200.8	454047
60271349004	R-MW-4	EPA 200.8	454029	EPA 200.8	454047
60271349005	R-MW-5	EPA 200.8	454029	EPA 200.8	454047
60271349006	R-MW-6	EPA 200.8	454029	EPA 200.8	454047
60271349007	R-MW-7	EPA 200.8	454029	EPA 200.8	454047
60271349008	R-MW-B1	EPA 200.8	454029	EPA 200.8	454047
60271349009	R-MW-B2	EPA 200.8	454029	EPA 200.8	454047
60271349010	R-DUP-1	EPA 200.8	454029	EPA 200.8	454047
60271349011	R-FB-1	EPA 200.8	454029	EPA 200.8	454047
60271349001	R-MW-1	EPA 903.1	301351		
60271349002	R-MW-2	EPA 903.1	301351		
60271349003	R-MW-3	EPA 903.1	301351		
60271349004	R-MW-4	EPA 903.1	301351		
60271349005	R-MW-5	EPA 903.1	301351		
60271349006	R-MW-6	EPA 903.1	301351		
60271349007	R-MW-7	EPA 903.1	301351		
60271349008	R-MW-B1	EPA 903.1	301351		
60271349009	R-MW-B2	EPA 903.1	301351		
60271349010	R-DUP-1	EPA 903.1	301351		
60271349011	R-FB-1	EPA 903.1	301351		
60271349012	R-MW-4 MS	EPA 903.1	301351		
60271349013	R-MW-4 MSD	EPA 903.1	301351		
60271349001	R-MW-1	EPA 904.0	301377		
60271349002	R-MW-2	EPA 904.0	301377		
60271349003	R-MW-3	EPA 904.0	301377		
60271349004	R-MW-4	EPA 904.0	301377		
60271349005	R-MW-5	EPA 904.0	301377		
60271349006	R-MW-6	EPA 904.0	301377		
60271349007	R-MW-7	EPA 904.0	301377		
60271349008	R-MW-B1	EPA 904.0	301377		
60271349009	R-MW-B2	EPA 904.0	301377		
60271349010	R-DUP-1	EPA 904.0	301377		
60271349011	R-FB-1	EPA 904.0	301377		
60271349012	R-MW-4 MS	EPA 904.0	301377		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271349013	R-MW-4 MSD	EPA 904.0	301377		
60271349001	R-MW-1	SM 2320B	528701		
60271349002	R-MW-2	SM 2320B	528701		
60271349003	R-MW-3	SM 2320B	528701		
60271349004	R-MW-4	SM 2320B	528701		
60271349005	R-MW-5	SM 2320B	528701		
60271349006	R-MW-6	SM 2320B	528701		
60271349007	R-MW-7	SM 2320B	528701		
60271349008	R-MW-B1	SM 2320B	528701		
60271349009	R-MW-B2	SM 2320B	528701		
60271349010	R-DUP-1	SM 2320B	528701		
60271349011	R-FB-1	SM 2320B	528701		
60271349001	R-MW-1	SM 2540C	527980		
60271349002	R-MW-2	SM 2540C	527980		
60271349003	R-MW-3	SM 2540C	527980		
60271349004	R-MW-4	SM 2540C	527980		
60271349005	R-MW-5	SM 2540C	527980		
60271349006	R-MW-6	SM 2540C	527983		
60271349007	R-MW-7	SM 2540C	527983		
60271349008	R-MW-B1	SM 2540C	527980		
60271349009	R-MW-B2	SM 2540C	527980		
60271349010	R-DUP-1	SM 2540C	527980		
60271349011	R-FB-1	SM 2540C	527983		
60271349001	R-MW-1	EPA 300.0	529035		
60271349001	R-MW-1	EPA 300.0	529292		
60271349002	R-MW-2	EPA 300.0	529142		
60271349003	R-MW-3	EPA 300.0	529291		
60271349003	R-MW-3	EPA 300.0	529310		
60271349004	R-MW-4	EPA 300.0	529291		
60271349004	R-MW-4	EPA 300.0	529310		
60271349005	R-MW-5	EPA 300.0	529291		
60271349006	R-MW-6	EPA 300.0	529291		
60271349006	R-MW-6	EPA 300.0	529343		
60271349007	R-MW-7	EPA 300.0	529291		
60271349007	R-MW-7	EPA 300.0	529343		
60271349008	R-MW-B1	EPA 300.0	529291		
60271349008	R-MW-B1	EPA 300.0	529310		
60271349009	R-MW-B2	EPA 300.0	529291		
60271349009	R-MW-B2	EPA 300.0	529570		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RUSH ISLAND ENERGY CTR

Pace Project No.: 60271349

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60271349010	R-DUP-1	EPA 300.0	529291		
60271349011	R-FB-1	EPA 300.0	529291		

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Sample Condition Upon Receipt

WO#: 60271349



Client Name: Golder Associates

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

Tracking #: _____ Pace Shipping Label Used? Yes No

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

Packing Material: Bubble Wrap Bubble Bags Foam None Other

Thermometer Used: T-297 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 24.0, Corr. Factor 10.9 Corrected 24.9, 1.1

Date and initials of person examining contents: JLS
AC 5/20

Temperature should be above freezing to 6°C 0.2

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Golder Associates	Report To: Mark Haddock (mhaddock@golder.com)	Company Name: Jeffrey Ingram	Attention:	REGULATORY AGENCY	
Address: 820 South Main Street, Suite 100	Copy To: Ryan Feldmann	Address:		<input type="checkbox"/> NPDES <input checked="" type="checkbox"/> GROUND WATER <input type="checkbox"/> DRINKING WATER	
Email To: mhaddock@golder.com	Purchase Order No.: <u>153-1406.0002E</u>	Pace Quote Reference:		<input type="checkbox"/> UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER	
Phone: 636-724-9191	Project Name: Ameren Rush Island Engery Center	Pace Project Manager:	Jamie Church	Site Location	MO
Requested Due Date/TAT: Standard	Project Number: 153-1406.0002E	Pace Profile #:	9285	STATE:	

ITEM #	Section D Required Client Information	Valid Matrix Codes	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB										
1	R-MW-1	DRINKING WATER	WT	G	5/24/18	1540		4	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
2	R-MW-2	WASTE WATER	WT	G	5/24/18	1420		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
3	R-MW-3	WASTE WATER	WT	G	5/24/18	1255		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
4	R-MW-4	WASTE WATER	WT	G	5/24/18	1050		12	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
5	R-MW-5	WASTE WATER	WT	G	5/24/18	0915		4	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
6	R-MW-6	WASTE WATER	WT	G	5/24/18	1050		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
7	R-MW-7	WASTE WATER	WT	G	5/24/18	1020		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
8	R-MW-B1	WASTE WATER	WT	G	5/24/18	1525		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
9	R-MW-B2	WASTE WATER	WT	G	5/24/18	1405		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
10	R-DUP-1	WASTE WATER	WT	G	5/24/18	0955		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN
11	R-FB-1	WASTE WATER	WT	G	5/24/18	0955		1	Unpreserved	Analysis Test	Metals	Chloride/Fluoride/Sulfate	TDS	Alkalinity		BPZU BP3N ZBPIN

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.8: Sb, As, Se	Mark Haddock / Golder	5/29/18	1505	Ryan Feldmann / Pace	5/29/18	1505	Y Y Y Y Y
EPA 200.8: Sb, As, Se	Mark Haddock / Golder	5/25/18	1700	Ryan Feldmann / Pace	5/25/18	1700	Y Y Y Y Y

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

MEMORANDUM**DATE** 8/20/18**Project No.** 1531406**TO** Project File
Golder Associates**CC****FROM** Tommy Goodwin**EMAIL** tgoodwin@golder.com**DATA VALIDATION SUMMARY: AMEREN – RUSH ISLAND ENERGY CENTER - RCPA - AMEREN
GROUNDWATER- DATA PACKAGE 60271349**

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- Reported results with high levels of non-target analytes or other matrix interference were analyzed at dilution and qualified as dilution (D).
- When a field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).
- When a compound was detected in a sample corresponding to a matrix spike/matrix spike duplicate that was outside the allowed range the results were recorded at the detection value and qualified as estimates (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren GW - RCFA - DMZ
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406
 Validation Date: 8/20/18

Laboratory: Pace Analytical SDG #: 60271349
 Analytical Method (type and no.): 200.7 Metals, Total; 2320B Alkalinity; 2540C TDS; 300.0 Anions, Rad 903.1 + 904.0
 Matrix: Air Soil/Sed. Water Waste
 Sample Names: R-MW-1, R-MW-2, R-MW-3, R-MW-4, R-MW-5, R-MW-6, R-MW-7, R-MW-81, R-MW-82, R-DWP-1, R-FB-1, R-MW-4MS, R-MW-4MSD

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>5/24 - 5/25/18</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Chloride, Sulfate</u>
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Ca, B, Mn,</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"/>	Sulfate (0.28)
b) Were analytes detected in the field blank(s)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Dup-1@ R-MW-5
b) Were field dup. precision criteria met (note RPD)?	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	FB-1@ R-MW-6 RPD < 2.8% ; Ra-228 (200%)
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 checked="" 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"/>	B,
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"/>	B, Ca, Na
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:

July 16, 2018

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

RE: Project: AMEREN MO CCR MONITORING
Pace Project No.: 60274126

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory on July 04, 2018. 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 MO CCR MONITORING

Pace Project No.: 60274126

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Missouri Certification Number: 10090

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

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274126001	R-MW-1	Water	07/03/18 11:40	07/04/18 04:40
60274126002	R-MW-2	Water	07/03/18 12:50	07/04/18 04:40
60274126003	R-MW-7	Water	07/03/18 13:40	07/04/18 04:40
60274126004	R-MW-3	Water	07/03/18 14:00	07/04/18 04:40
60274126005	R-MW-4	Water	07/03/18 15:15	07/04/18 04:40
60274126006	R-FB-1	Water	07/03/18 13:57	07/04/18 04:40
60274126007	R-DUP-1	Water	07/03/18 11:40	07/04/18 04:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274126001	R-MW-1	EPA 300.0	OL	1	PASI-K
60274126002	R-MW-2	SM 2540C	JDA	1	PASI-K
60274126003	R-MW-7	EPA 200.7	TDS	2	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60274126004	R-MW-3	SM 2540C	JDA	1	PASI-K
60274126005	R-MW-4	EPA 300.0	OL	1	PASI-K
60274126006	R-FB-1	EPA 200.7	TDS	2	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60274126007	R-DUP-1	SM 2540C	JDA	1	PASI-K

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-MW-1 **Lab ID: 60274126001** Collected: 07/03/18 11:40 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Fluoride	0.44	mg/L	0.20	0.063	1		07/15/18 00:56	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-MW-2 **Lab ID: 60274126002** Collected: 07/03/18 12:50 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	813	mg/L	5.0	5.0	1		07/09/18 11:21		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-MW-7 **Lab ID: 60274126003** Collected: 07/03/18 13:40 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	2400	ug/L	100	12.5	1	07/06/18 15:00	07/10/18 17:43	7440-42-8	
Calcium	68400	ug/L	200	53.5	1	07/06/18 15:00	07/10/18 17:43	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	414	mg/L	5.0	5.0	1		07/09/18 11:21		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	14.8	mg/L	1.0	0.46	1		07/15/18 16:36	16887-00-6	M1
Fluoride	0.37	mg/L	0.20	0.063	1		07/15/18 16:36	16984-48-8	
Sulfate	83.7	mg/L	10.0	2.4	10		07/15/18 17:01	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-MW-3 **Lab ID: 60274126004** Collected: 07/03/18 14:00 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	776	mg/L	5.0	5.0	1		07/09/18 11:21		

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-MW-4 **Lab ID: 60274126005** Collected: 07/03/18 15:15 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days									
Analytical Method: EPA 300.0									
Sulfate	47.1	mg/L	5.0	1.2	5		07/15/18 17:27	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-FB-1 **Lab ID: 60274126006** Collected: 07/03/18 13:57 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron	15.4J	ug/L	100	12.5	1	07/06/18 15:00	07/10/18 17:54	7440-42-8	
Calcium	<53.5	ug/L	200	53.5	1	07/06/18 15:00	07/10/18 17:54	7440-70-2	
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		07/09/18 11:21		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	<0.46	mg/L	1.0	0.46	1		07/15/18 17:40	16887-00-6	
Fluoride	<0.063	mg/L	0.20	0.063	1		07/15/18 17:40	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		07/15/18 17:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Sample: R-DUP-1 **Lab ID: 60274126007** Collected: 07/03/18 11:40 Received: 07/04/18 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids									
Analytical Method: SM 2540C									
Total Dissolved Solids	808	mg/L	5.0	5.0	1		07/09/18 11:21		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

QC Batch:	533193	Analysis Method:	EPA 200.7
QC Batch Method:	EPA 200.7	Analysis Description:	200.7 Metals, Total
Associated Lab Samples:	60274126003, 60274126006		

METHOD BLANK: 2183795 Matrix: Water

Associated Lab Samples: 60274126003, 60274126006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<12.5	100	12.5	07/10/18 17:17	
Calcium	ug/L	<53.5	200	53.5	07/10/18 17:17	

LABORATORY CONTROL SAMPLE: 2183796

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	993	99	85-115	
Calcium	ug/L	10000	9780	98	85-115	

MATRIX SPIKE SAMPLE: 2183797

Parameter	Units	60274183001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1120	1000	2060	95	70-130	
Calcium	ug/L	136000	10000	142000	60	70-130 M1	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2183798 2183799

Parameter	Units	60274126003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	2400	1000	1000	3370	3450	97	105	70-130	2	20	
Calcium	ug/L	68400	10000	10000	79900	80800	115	124	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

QC Batch: 533427

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60274126002, 60274126003, 60274126004, 60274126006, 60274126007

METHOD BLANK: 2184817

Matrix: Water

Associated Lab Samples: 60274126002, 60274126003, 60274126004, 60274126006, 60274126007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	07/09/18 11:21	

LABORATORY CONTROL SAMPLE: 2184818

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

SAMPLE DUPLICATE: 2184819

Parameter	Units	60274099003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	894	893	0	10	

SAMPLE DUPLICATE: 2184820

Parameter	Units	60274126003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	414	410	1	10	

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QUALITY CONTROL DATA

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

QC Batch: 534414	Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0	Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60274126001	

METHOD BLANK: 2188763 Matrix: Water

Associated Lab Samples: 60274126001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	<0.063	0.20	0.063	07/14/18 21:26	

LABORATORY CONTROL SAMPLE: 2188764

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

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QUALITY CONTROL DATA

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

QC Batch: 534438 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60274126003, 60274126005, 60274126006

METHOD BLANK: 2189085 Matrix: Water

Associated Lab Samples: 60274126003, 60274126005, 60274126006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	07/15/18 12:33	
Fluoride	mg/L	<0.063	0.20	0.063	07/15/18 12:33	
Sulfate	mg/L	<0.24	1.0	0.24	07/15/18 12:33	

LABORATORY CONTROL SAMPLE: 2189086

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	2.5	99	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2189087 2189088

Parameter	Units	60274099003		2189087		2189088		% Rec Limits	RPD	Max RPD	Qual
		MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec				
Chloride	mg/L	18.9	5	5	24.7	24.7	114	115	90-110	0	15 E,M1
Fluoride	mg/L	0.34	2.5	2.5	2.9	2.9	102	104	90-110	1	15
Sulfate	mg/L	321	100	100	418	422	97	101	90-110	1	15 E

MATRIX SPIKE SAMPLE: 2189089

Parameter	Units	60274126003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	14.8	5	20.5	113	90-110	E,M1
Fluoride	mg/L	0.37	2.5	2.9	101	90-110	
Sulfate	mg/L	83.7	50	133	99	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MO CCR MONITORING

Pace Project No.: 60274126

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274126003	R-MW-7	EPA 200.7	533193	EPA 200.7	533291
60274126006	R-FB-1	EPA 200.7	533193	EPA 200.7	533291
60274126002	R-MW-2	SM 2540C	533427		
60274126003	R-MW-7	SM 2540C	533427		
60274126004	R-MW-3	SM 2540C	533427		
60274126006	R-FB-1	SM 2540C	533427		
60274126007	R-DUP-1	SM 2540C	533427		
60274126001	R-MW-1	EPA 300.0	534414		
60274126003	R-MW-7	EPA 300.0	534438		
60274126005	R-MW-4	EPA 300.0	534438		
60274126006	R-FB-1	EPA 300.0	534438		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60274126

60274126

Client Name: Golder Assoc.

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 zplc

Thermometer Used: T300 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.8 Corr. Factor +1.2 Corrected 2.0

Date and initials of person examining contents: 7/5/18 dlw

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 checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>R-mw-4 has no label for</u>
Samples contain multiple phases? Matrix: <u>WT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	<u>sample containers</u>
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State: _____	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jamie Chack _____ Date: 7/5/18



MEMORANDUM

DATE August 20, 2018

Project No. 1531406

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Tommy Goodwin

EMAIL Tommy_Goodwin@golder.com

DATA VALIDATION SUMMARY, RUSH ISLAND ENERGY CENTER– AMEREN GROUNDWATER – DATA PACKAGE 60274126

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 corresponding to a matrix spike/matrix spike duplicate that was outside the allowed range the results were recorded at the detection value and qualified as estimates (J).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren - GW-REC-VS2
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406
 Validation Date: 8/20/18

Laboratory: Pace Analytical SDG #: 60274126
 Analytical Method (type and no.): EPA 300.0 (Ammonia), SM 2540C (TDS), EPA 200.7 (Metals)
 Matrix: Air Soil/Sed. Water Waste
 Sample Names: R-MW-1, R-MW-2, R-MW-3, R-MW-4, R-MW-7, R-FB-1, R-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>7/3/18</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Note Deficiencies: _____

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were hold times met for sample analysis?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were the correct preservatives used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Was the correct method used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
e) Were appropriate reporting limits achieved?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
f) Were any sample dilutions noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>SO₄²⁻</u>
g) Were any matrix problems noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Cl⁻</u>

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 checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	B(15.4J)
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"/>	Dup-1@ R-MW-2
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	FB-1@ R-MW-3
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"/>	_____
	<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"/>	Ca, Cl ⁻
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"/>	Cl ⁻
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____
c) Were MS/MSD precision criteria met?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

Comments/Notes:

December 26, 2018

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

RE: Project: AMEREN RIEC RCPA / GeoHydro
Pace Project No.: 60285463

Dear Mark Haddock:

Enclosed are the analytical results for sample(s) received by the laboratory between November 02, 2018 and November 07, 2018. 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, 12/26/18: Samples moved to workorder number 60290480.

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
Eric Schneider, Golder Associates



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Pennsylvania Certification IDs

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

ANAB DOD-ELAP Rad Accreditation #: L2417

Alabama Certification #: 41590

Arizona Certification #: AZ0734

Arkansas Certification

California Certification #: 04222CA

Colorado Certification #: PA01547

Connecticut Certification #: PH-0694

Delaware Certification

EPA Region 4 DW Rad

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 #: KY90133

KY WW Permit #: KY0098221

KY WW Permit #: KY0000221

Louisiana DHH/TNI Certification #: LA180012

Louisiana DEQ/TNI Certification #: 4086

Maine Certification #: 2017020

Maryland Certification #: 308

Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification #: 9991

Missouri Certification #: 235

Montana Certification #: Cert0082

Nebraska Certification #: NE-OS-29-14

Nevada Certification #: PA014572018-1

New Hampshire/TNI Certification #: 297617

New Jersey/TNI Certification #: PA051

New Mexico Certification #: PA01457

New York/TNI Certification #: 10888

North Carolina Certification #: 42706

North Dakota Certification #: R-190

Ohio EPA Rad Approval: #41249

Oregon/TNI Certification #: PA200002-010

Pennsylvania/TNI Certification #: 65-00282

Puerto Rico Certification #: PA01457

Rhode Island Certification #: 65-00282

South Dakota Certification

Tennessee Certification #: 02867

Texas/TNI Certification #: T104704188-17-3

Utah/TNI Certification #: PA014572017-9

USDA Soil Permit #: P330-17-00091

Vermont Dept. of Health: ID# VT-0282

Virgin Island/PADEP Certification

Virginia/VELAP Certification #: 9526

Washington Certification #: C868

West Virginia DEP Certification #: 143

West Virginia DHHR Certification #: 9964C

Wisconsin Approve List for Rad

Wyoming Certification #: 8TMS-L

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

Arkansas Drinking Water

Missouri Certification Number: 10090

WY STR Certification #: 2456.01

Arkansas Certification #: 18-016-0

Arkansas Drinking Water

Illinois Certification #: 004455

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116 / E10426

Louisiana Certification #: 03055

Nevada Certification #: KS000212018-1

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407-18-11

Utah Certification #: KS000212018-8

Kansas Field Laboratory Accreditation: # E-92587

Missouri Certification: 10070

Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60285463001	R-MW-4	Water	11/01/18 13:45	11/02/18 02:38
60285463002	R-MW-5	Water	11/01/18 13:35	11/02/18 02:38
60285463003	R-DUP-1	Water	11/01/18 13:35	11/02/18 02:38
60285463004	R-MW-5 MS	Water	11/01/18 13:35	11/02/18 02:38
60285463005	R-MW-5 MSD	Water	11/01/18 13:35	11/02/18 02:38
60285589001	R-MW-1	Water	11/02/18 10:25	11/03/18 02:40
60285589002	R-MW-3	Water	11/02/18 14:10	11/03/18 02:40
60285589003	R-MW-7	Water	11/02/18 11:35	11/03/18 02:40
60285589004	R-MW-B1	Water	11/02/18 10:25	11/03/18 02:40
60285589007	R-DUP-2	Water	11/02/18 10:25	11/03/18 02:40
60285589008	R-FB-1	Water	11/02/18 11:33	11/03/18 02:40
60285463014	R-MW-2	Water	11/05/18 11:55	11/06/18 04:09
60285463019	R-MW-6	Water	11/06/18 09:10	11/07/18 03:58
60285463020	R-MW-B2	Water	11/06/18 10:50	11/07/18 03:58
60285463021	R-FB-2	Water	11/06/18 09:00	11/07/18 03:58

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory		
60285463001	R-MW-4	EPA 200.7	EMR	18	PASI-K		
		EPA 200.7	EMR	18	PASI-K		
		EPA 200.8	JGP	6	PASI-K		
		EPA 200.8	JGP	6	PASI-K		
		EPA 903.1	MK1	1	PASI-PA		
		EPA 904.0	JLW	1	PASI-PA		
		SM 2320B	MJK	1	PASI-K		
		SM 2540C	RLG	1	PASI-K		
		SM 3500-Fe B#4	LDB	1	PASI-K		
		SM 3500-Fe B#4	MJK	1	PASI-K		
		EPA 300.0	WNM	3	PASI-K		
		EPA 365.4	BLA	1	PASI-K		
		60285463002	R-MW-5	EPA 200.7	EMR	18	PASI-K
				EPA 200.7	EMR	18	PASI-K
EPA 200.8	JGP			6	PASI-K		
EPA 200.8	JGP			6	PASI-K		
EPA 903.1	MK1			1	PASI-PA		
EPA 904.0	JLW			1	PASI-PA		
SM 2320B	MJK			1	PASI-K		
SM 2540C	RLG			1	PASI-K		
SM 3500-Fe B#4	LDB			1	PASI-K		
SM 3500-Fe B#4	MJK			1	PASI-K		
EPA 300.0	WNM			3	PASI-K		
EPA 365.4	BLA			1	PASI-K		
60285463003	R-DUP-1			EPA 200.7	EMR	18	PASI-K
				EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JGP	6	PASI-K		
		EPA 200.8	JGP	6	PASI-K		
		EPA 903.1	MK1	1	PASI-PA		
		EPA 904.0	JLW	1	PASI-PA		
		SM 2320B	MJK	1	PASI-K		
		SM 2540C	RLG	1	PASI-K		
		SM 3500-Fe B#4	LDB	1	PASI-K		
		SM 3500-Fe B#4	MJK	1	PASI-K		
		EPA 300.0	WNM	3	PASI-K		
		EPA 365.4	BLA	1	PASI-K		
		60285463004	R-MW-5 MS	EPA 903.1	MK1	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60285463005	R-MW-5 MSD	EPA 904.0	JLW	1	PASI-PA
		EPA 903.1	MK1	1	PASI-PA
60285589001	R-MW-1	EPA 904.0	JLW	1	PASI-PA
		EPA 200.7	EMR	18	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	MJK	1	PASI-K
60285589002	R-MW-3	EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
60285589003	R-MW-7	SM 3500-Fe B#4	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
SM 3500-Fe B#4	LDB	1	PASI-K		
SM 3500-Fe B#4	MJK	1	PASI-K		

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SAMPLE ANALYTE COUNT

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60285589004	R-MW-B1	EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
60285589007	R-DUP-2	SM 3500-Fe B#4	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
60285589008	R-FB-1	SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
60285463014	R-MW-2	SM 3500-Fe B#4	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
		EPA 200.7	EMR	18	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.7	JGP	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RMT	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	MJK	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60285463019	R-MW-6	EPA 200.7	EMR	18	PASI-K
		EPA 200.7	JGP	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	ZMH	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60285463020	R-MW-B2	EPA 200.7	EMR	18	PASI-K
		EPA 200.7	JGP	18	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 200.8	JDH	6	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	ZMH	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60285463021	R-FB-2	EPA 200.7	EMR	18	PASI-K
		EPA 200.8	JDH	6	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	ZMH	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	ZMH	1	PASI-K
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-4 **Lab ID: 60285463001** Collected: 11/01/18 13:45 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	34.5J	ug/L	75.0	21.1	1	11/05/18 17:55	11/07/18 16:04	7429-90-5	B
Barium	237	ug/L	5.0	1.5	1	11/05/18 17:55	11/07/18 16:04	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/05/18 17:55	11/07/18 16:04	7440-41-7	
Boron	4000	ug/L	100	12.5	1	11/05/18 17:55	11/07/18 16:04	7440-42-8	
Calcium	60500	ug/L	200	53.5	1	11/05/18 17:55	11/07/18 16:04	7440-70-2	
Cobalt	0.96J	ug/L	5.0	0.87	1	11/05/18 17:55	11/07/18 16:04	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/05/18 17:55	11/07/18 16:04	7440-50-8	
Iron	4390	ug/L	50.0	6.1	1	11/05/18 17:55	11/07/18 16:04	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/05/18 17:55	11/07/18 16:04	7439-92-1	
Lithium	40.3	ug/L	10.0	4.6	1	11/05/18 17:55	11/07/18 16:04	7439-93-2	
Magnesium	12100	ug/L	50.0	14.0	1	11/05/18 17:55	11/07/18 16:04	7439-95-4	
Manganese	232	ug/L	5.0	0.73	1	11/05/18 17:55	11/07/18 16:04	7439-96-5	
Molybdenum	89.6	ug/L	20.0	0.90	1	11/05/18 17:55	11/07/18 16:04	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/05/18 17:55	11/07/18 16:04	7440-02-0	
Potassium	4340	ug/L	500	79.3	1	11/05/18 17:55	11/07/18 16:04	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/05/18 17:55	11/07/18 16:04	7440-22-4	
Sodium	57600	ug/L	500	157	1	11/05/18 17:55	11/07/18 16:04	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/05/18 17:55	11/07/18 16:04	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	39.0J	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:27	7429-90-5	
Barium, Dissolved	255	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:27	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:27	7440-41-7	
Boron, Dissolved	4200	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:27	7440-42-8	
Calcium, Dissolved	66700	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:27	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:27	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:27	7440-50-8	
Iron, Dissolved	4570	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:27	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:27	7439-92-1	
Lithium, Dissolved	43.5	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:27	7439-93-2	
Magnesium, Dissolved	13600	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:27	7439-95-4	
Manganese, Dissolved	261	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:27	7439-96-5	
Molybdenum, Dissolved	97.6	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:27	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:27	7440-02-0	
Potassium, Dissolved	4760	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:27	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:27	7440-22-4	
Sodium, Dissolved	62500	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:27	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:27	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:10	7440-36-0	
Arsenic	6.3	ug/L	1.0	0.065	1	11/05/18 17:55	11/08/18 15:10	7440-38-2	
Cadmium	<0.033	ug/L	0.50	0.033	1	11/05/18 17:55	11/08/18 15:10	7440-43-9	
Chromium	0.18J	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:10	7440-47-3	
Selenium	0.14J	ug/L	1.0	0.085	1	11/05/18 17:55	11/08/18 15:10	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/05/18 17:55	11/08/18 15:10	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-4 **Lab ID: 60285463001** Collected: 11/01/18 13:45 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:43	7440-36-0	
Arsenic, Dissolved	6.5	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:43	7440-38-2	D9
Cadmium, Dissolved	0.083J	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:43	7440-43-9	
Chromium, Dissolved	0.20J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:43	7440-47-3	
Selenium, Dissolved	0.21J	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:43	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:43	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	262	mg/L	20.0	4.9	1		11/09/18 13:38		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	99.0	mg/L	5.0	5.0	1		11/06/18 07:50		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	3.9	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.45	mg/L	0.20	0.012	1		11/05/18 16:24		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	20.9	mg/L	5.0	1.4	5		11/15/18 17:34	16887-00-6	
Fluoride	0.92	mg/L	0.20	0.19	1		11/15/18 17:03	16984-48-8	
Sulfate	51.8	mg/L	5.0	1.2	5		11/15/18 17:34	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.97	mg/L	0.10	0.050	1		11/08/18 12:15	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-5 **Lab ID: 60285463002** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	138	ug/L	75.0	21.1	1	11/05/18 17:55	11/07/18 16:06	7429-90-5	B,M1
Barium	378	ug/L	5.0	1.5	1	11/05/18 17:55	11/07/18 16:06	7440-39-3	M1
Beryllium	<0.16	ug/L	1.0	0.16	1	11/05/18 17:55	11/07/18 16:06	7440-41-7	M1
Boron	115	ug/L	100	12.5	1	11/05/18 17:55	11/07/18 16:06	7440-42-8	M1
Calcium	130000	ug/L	200	53.5	1	11/05/18 17:55	11/07/18 16:06	7440-70-2	M1
Cobalt	<0.87	ug/L	5.0	0.87	1	11/05/18 17:55	11/07/18 16:06	7440-48-4	M1
Copper	<4.5	ug/L	10.0	4.5	1	11/05/18 17:55	11/07/18 16:06	7440-50-8	M1
Iron	11400	ug/L	50.0	6.1	1	11/05/18 17:55	11/07/18 16:06	7439-89-6	M1
Lead	<3.0	ug/L	10.0	3.0	1	11/05/18 17:55	11/07/18 16:06	7439-92-1	M1
Lithium	8.6J	ug/L	10.0	4.6	1	11/05/18 17:55	11/07/18 16:06	7439-93-2	M1
Magnesium	17800	ug/L	50.0	14.0	1	11/05/18 17:55	11/07/18 16:06	7439-95-4	M1
Manganese	445	ug/L	5.0	0.73	1	11/05/18 17:55	11/07/18 16:06	7439-96-5	M1
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/05/18 17:55	11/07/18 16:06	7439-98-7	M1
Nickel	<1.4	ug/L	5.0	1.4	1	11/05/18 17:55	11/07/18 16:06	7440-02-0	M1
Potassium	2200	ug/L	500	79.3	1	11/05/18 17:55	11/07/18 16:06	7440-09-7	M1
Silver	<2.0	ug/L	7.0	2.0	1	11/05/18 17:55	11/07/18 16:06	7440-22-4	M1
Sodium	4740	ug/L	500	157	1	11/05/18 17:55	11/07/18 16:06	7440-23-5	M1
Zinc	5.2J	ug/L	50.0	3.5	1	11/05/18 17:55	11/07/18 16:06	7440-66-6	M1
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	93.6	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:29	7429-90-5	
Barium, Dissolved	374	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:29	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:29	7440-41-7	
Boron, Dissolved	101	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:29	7440-42-8	
Calcium, Dissolved	130000	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:29	7440-70-2	M1
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:29	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:29	7440-50-8	
Iron, Dissolved	10700	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:29	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:29	7439-92-1	
Lithium, Dissolved	10.2	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:29	7439-93-2	
Magnesium, Dissolved	17800	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:29	7439-95-4	
Manganese, Dissolved	446	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:29	7439-96-5	
Molybdenum, Dissolved	<0.90	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:29	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:29	7440-02-0	
Potassium, Dissolved	2180	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:29	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:29	7440-22-4	
Sodium, Dissolved	5080	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:29	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:29	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:12	7440-36-0	
Arsenic	3.6	ug/L	1.0	0.065	1	11/05/18 17:55	11/08/18 15:12	7440-38-2	
Cadmium	<0.033	ug/L	0.50	0.033	1	11/05/18 17:55	11/08/18 15:12	7440-43-9	
Chromium	0.15J	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:12	7440-47-3	
Selenium	<0.085	ug/L	1.0	0.085	1	11/05/18 17:55	11/08/18 15:12	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/05/18 17:55	11/08/18 15:12	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-5 **Lab ID: 60285463002** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:45	7440-36-0	
Arsenic, Dissolved	3.5	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:45	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:45	7440-43-9	
Chromium, Dissolved	<0.19	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:45	7440-47-3	
Selenium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:45	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:45	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	385	mg/L	20.0	4.9	1		11/09/18 13:53		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	411	mg/L	5.0	5.0	1		11/08/18 08:04		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	10.8	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.61	mg/L	0.20	0.012	1		11/05/18 16:24		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	7.4	mg/L	1.0	0.29	1		11/15/18 17:48	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		11/15/18 17:48	16984-48-8	
Sulfate	14.3	mg/L	1.0	0.24	1		11/15/18 17:48	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.41	mg/L	0.10	0.050	1		11/08/18 12:16	7723-14-0	M1

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-1 **Lab ID: 60285463003** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	41.2J	ug/L	75.0	21.1	1	11/05/18 17:55	11/07/18 16:13	7429-90-5	B
Barium	231	ug/L	5.0	1.5	1	11/05/18 17:55	11/07/18 16:13	7440-39-3	
Beryllium	0.21J	ug/L	1.0	0.16	1	11/05/18 17:55	11/07/18 16:13	7440-41-7	
Boron	3940	ug/L	100	12.5	1	11/05/18 17:55	11/07/18 16:13	7440-42-8	
Calcium	58700	ug/L	200	53.5	1	11/05/18 17:55	11/07/18 16:13	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/05/18 17:55	11/07/18 16:13	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/05/18 17:55	11/07/18 16:13	7440-50-8	
Iron	4250	ug/L	50.0	6.1	1	11/05/18 17:55	11/07/18 16:13	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/05/18 17:55	11/07/18 16:13	7439-92-1	
Lithium	40.9	ug/L	10.0	4.6	1	11/05/18 17:55	11/07/18 16:13	7439-93-2	
Magnesium	11900	ug/L	50.0	14.0	1	11/05/18 17:55	11/07/18 16:13	7439-95-4	
Manganese	227	ug/L	5.0	0.73	1	11/05/18 17:55	11/07/18 16:13	7439-96-5	
Molybdenum	88.0	ug/L	20.0	0.90	1	11/05/18 17:55	11/07/18 16:13	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/05/18 17:55	11/07/18 16:13	7440-02-0	
Potassium	4240	ug/L	500	79.3	1	11/05/18 17:55	11/07/18 16:13	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/05/18 17:55	11/07/18 16:13	7440-22-4	
Sodium	56200	ug/L	500	157	1	11/05/18 17:55	11/07/18 16:13	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/05/18 17:55	11/07/18 16:13	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	<21.1	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:40	7429-90-5	
Barium, Dissolved	250	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:40	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:40	7440-41-7	
Boron, Dissolved	4160	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:40	7440-42-8	
Calcium, Dissolved	65000	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:40	7440-70-2	
Cobalt, Dissolved	0.99J	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:40	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:40	7440-50-8	
Iron, Dissolved	4490	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:40	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:40	7439-92-1	
Lithium, Dissolved	41.9	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:40	7439-93-2	
Magnesium, Dissolved	13400	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:40	7439-95-4	
Manganese, Dissolved	258	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:40	7439-96-5	
Molybdenum, Dissolved	95.7	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:40	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:40	7440-02-0	
Potassium, Dissolved	4620	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:40	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:40	7440-22-4	
Sodium, Dissolved	60900	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:40	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:40	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:19	7440-36-0	
Arsenic	6.3	ug/L	1.0	0.065	1	11/05/18 17:55	11/08/18 15:19	7440-38-2	
Cadmium	0.059J	ug/L	0.50	0.033	1	11/05/18 17:55	11/08/18 15:19	7440-43-9	
Chromium	0.16J	ug/L	1.0	0.078	1	11/05/18 17:55	11/08/18 15:19	7440-47-3	
Selenium	0.15J	ug/L	1.0	0.085	1	11/05/18 17:55	11/08/18 15:19	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/05/18 17:55	11/08/18 15:19	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-1 **Lab ID: 60285463003** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:51	7440-36-0	
Arsenic, Dissolved	6.4	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:51	7440-38-2	D9
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:51	7440-43-9	
Chromium, Dissolved	0.21J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:51	7440-47-3	
Selenium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:51	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:51	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	273	mg/L	20.0	4.9	1		11/09/18 14:04		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	439	mg/L	5.0	5.0	1		11/08/18 08:07		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	3.8	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.41	mg/L	0.20	0.012	1		11/05/18 16:25		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	22.0	mg/L	10.0	2.9	10		11/15/18 18:59	16887-00-6	
Fluoride	0.90	mg/L	0.20	0.19	1		11/15/18 18:16	16984-48-8	
Sulfate	51.5	mg/L	10.0	2.4	10		11/15/18 18:59	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.99	mg/L	0.10	0.050	1		11/08/18 12:21	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-1 **Lab ID:** 60285589001 Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	422	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 17:41	7429-90-5	
Barium	15.1	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 17:41	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 17:41	7440-41-7	
Boron	2470	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 17:41	7440-42-8	
Calcium	26800	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 17:41	7440-70-2	
Cobalt	0.92J	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 17:41	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 17:41	7440-50-8	
Iron	13.1J	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 17:41	7439-89-6	B
Lead	<3.0	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 17:41	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 17:41	7439-93-2	
Magnesium	753	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 17:41	7439-95-4	
Manganese	2.3J	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 17:41	7439-96-5	
Molybdenum	102	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 17:41	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 17:41	7440-02-0	
Potassium	6080	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 17:41	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 17:41	7440-22-4	
Sodium	107000	ug/L	500	157	1	11/07/18 10:32	11/07/18 17:41	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 17:41	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	408	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:42	7429-90-5	
Barium, Dissolved	20.6	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:42	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:42	7440-41-7	
Boron, Dissolved	2560	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:42	7440-42-8	
Calcium, Dissolved	30800	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:42	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:42	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:42	7440-50-8	
Iron, Dissolved	18.6J	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:42	7439-89-6	B
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:42	7439-92-1	
Lithium, Dissolved	<4.6	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:42	7439-93-2	
Magnesium, Dissolved	872	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:42	7439-95-4	
Manganese, Dissolved	4.6J	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:42	7439-96-5	
Molybdenum, Dissolved	112	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:42	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:42	7440-02-0	
Potassium, Dissolved	6410	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:42	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:42	7440-22-4	
Sodium, Dissolved	113000	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:42	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:42	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.55J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:17	7440-36-0	
Arsenic	10.1	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:17	7440-38-2	
Cadmium	0.039J	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:17	7440-43-9	
Chromium	0.23J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:17	7440-47-3	B
Selenium	1.8	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:17	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:17	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-1 **Lab ID: 60285589001** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	0.55J	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:53	7440-36-0	
Arsenic, Dissolved	9.4	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:53	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:53	7440-43-9	
Chromium, Dissolved	<0.19	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:53	7440-47-3	
Selenium, Dissolved	1.6	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:53	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:53	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	63.5	mg/L	20.0	4.9	1		11/12/18 15:42		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	450	mg/L	5.0	5.0	1		11/08/18 08:05		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.0J	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.022J	mg/L	0.20	0.012	1		11/05/18 16:28		2e,H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	21.4	mg/L	2.0	0.58	2		11/17/18 00:57	16887-00-6	
Fluoride	0.36	mg/L	0.20	0.19	1		11/17/18 00:41	16984-48-8	
Sulfate	226	mg/L	20.0	4.8	20		11/17/18 01:13	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	<0.050	mg/L	0.10	0.050	1		11/08/18 12:46	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-3 **Lab ID: 60285589002** Collected: 11/02/18 14:10 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	65.4J	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 17:45	7429-90-5	
Barium	12.1	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 17:45	7440-39-3	
Beryllium	0.21J	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 17:45	7440-41-7	B
Boron	13800	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 17:45	7440-42-8	
Calcium	5480	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 17:45	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 17:45	7440-48-4	
Copper	8.8J	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 17:45	7440-50-8	
Iron	313	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 17:45	7439-89-6	
Lead	4.6J	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 17:45	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 17:45	7439-93-2	
Magnesium	45.4J	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 17:45	7439-95-4	
Manganese	9.5	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 17:45	7439-96-5	
Molybdenum	736	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 17:45	7439-98-7	
Nickel	3.9J	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 17:45	7440-02-0	
Potassium	1630	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 17:45	7440-09-7	B
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 17:45	7440-22-4	
Sodium	233000	ug/L	500	157	1	11/07/18 10:32	11/07/18 17:45	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 17:45	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	<21.1	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:44	7429-90-5	
Barium, Dissolved	14.2	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:44	7440-39-3	
Beryllium, Dissolved	0.21J	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:44	7440-41-7	
Boron, Dissolved	14000	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:44	7440-42-8	
Calcium, Dissolved	5910	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:44	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:44	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:44	7440-50-8	
Iron, Dissolved	153	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:44	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:44	7439-92-1	
Lithium, Dissolved	<4.6	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:44	7439-93-2	
Magnesium, Dissolved	38.6J	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:44	7439-95-4	
Manganese, Dissolved	5.9	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:44	7439-96-5	
Molybdenum, Dissolved	810	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:44	7439-98-7	
Nickel, Dissolved	4.0J	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:44	7440-02-0	
Potassium, Dissolved	1790	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:44	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:44	7440-22-4	
Sodium, Dissolved	242000	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:44	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:44	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.15J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:19	7440-36-0	
Arsenic	79.7	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:19	7440-38-2	
Cadmium	0.33J	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:19	7440-43-9	
Chromium	0.71J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:19	7440-47-3	B
Selenium	0.71J	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:19	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:19	7440-28-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-3 **Lab ID: 60285589002** Collected: 11/02/18 14:10 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:56	7440-36-0	
Arsenic, Dissolved	79.1	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:56	7440-38-2	
Cadmium, Dissolved	0.20J	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:56	7440-43-9	
Chromium, Dissolved	0.41J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:56	7440-47-3	
Selenium, Dissolved	0.52J	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:56	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:56	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	351	mg/L	20.0	4.9	1		11/12/18 15:48		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	722	mg/L	5.0	5.0	1		11/08/18 08:05		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.063	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.25	mg/L	0.20	0.012	1		11/05/18 16:41		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	30.5	mg/L	2.0	0.58	2		11/17/18 02:17	16887-00-6	
Fluoride	0.95	mg/L	0.20	0.19	1		11/17/18 01:29	16984-48-8	
Sulfate	132	mg/L	20.0	4.8	20		11/17/18 02:33	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	1.4	mg/L	0.10	0.050	1		11/08/18 12:48	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-7 Lab ID: 60285589003 Collected: 11/02/18 11:35 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	62.9J	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 17:47	7429-90-5	
Barium	280	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 17:47	7440-39-3	
Beryllium	1.2	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 17:47	7440-41-7	B
Boron	2480	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 17:47	7440-42-8	
Calcium	66700	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 17:47	7440-70-2	
Cobalt	1.4J	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 17:47	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 17:47	7440-50-8	
Iron	14300	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 17:47	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 17:47	7439-92-1	
Lithium	30.1	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 17:47	7439-93-2	
Magnesium	19000	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 17:47	7439-95-4	
Manganese	300	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 17:47	7439-96-5	
Molybdenum	162	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 17:47	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 17:47	7440-02-0	
Potassium	5180	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 17:47	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 17:47	7440-22-4	
Sodium	27300	ug/L	500	157	1	11/07/18 10:32	11/07/18 17:47	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 17:47	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	<21.1	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:47	7429-90-5	
Barium, Dissolved	297	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:47	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:47	7440-41-7	
Boron, Dissolved	2550	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:47	7440-42-8	
Calcium, Dissolved	73500	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:47	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:47	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:47	7440-50-8	
Iron, Dissolved	15100	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:47	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:47	7439-92-1	
Lithium, Dissolved	38.4	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:47	7439-93-2	
Magnesium, Dissolved	20000	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:47	7439-95-4	
Manganese, Dissolved	317	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:47	7439-96-5	
Molybdenum, Dissolved	173	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:47	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:47	7440-02-0	
Potassium, Dissolved	5350	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:47	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:47	7440-22-4	
Sodium, Dissolved	29400	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:47	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:47	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:21	7440-36-0	
Arsenic	84.9	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:21	7440-38-2	
Cadmium	0.065J	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:21	7440-43-9	
Chromium	0.24J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:21	7440-47-3	B
Selenium	<0.085	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:21	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:21	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-7 **Lab ID: 60285589003** Collected: 11/02/18 11:35 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:58	7440-36-0	
Arsenic, Dissolved	94.9	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 19:58	7440-38-2	D9
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 19:58	7440-43-9	
Chromium, Dissolved	<0.19	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 19:58	7440-47-3	
Selenium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 19:58	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 19:58	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	236	mg/L	20.0	4.9	1		11/12/18 15:53		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	404	mg/L	5.0	5.0	1		11/08/18 08:07		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	13.8	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.53	mg/L	0.20	0.012	1		11/05/18 16:29		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	14.6	mg/L	1.0	0.29	1		11/17/18 02:49	16887-00-6	
Fluoride	0.33	mg/L	0.20	0.19	1		11/17/18 02:49	16984-48-8	
Sulfate	77.7	mg/L	20.0	4.8	20		11/17/18 03:05	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.80	mg/L	0.10	0.050	1		11/08/18 12:49	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B1 **Lab ID: 60285589004** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	64.3J	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 17:50	7429-90-5	
Barium	432	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 17:50	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 17:50	7440-41-7	
Boron	140	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 17:50	7440-42-8	
Calcium	132000	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 17:50	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 17:50	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 17:50	7440-50-8	
Iron	23500	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 17:50	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 17:50	7439-92-1	
Lithium	60.2	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 17:50	7439-93-2	
Magnesium	43700	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 17:50	7439-95-4	
Manganese	1140	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 17:50	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 17:50	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 17:50	7440-02-0	
Potassium	8220	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 17:50	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 17:50	7440-22-4	
Sodium	24700	ug/L	500	157	1	11/07/18 10:32	11/07/18 17:50	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 17:50	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	113	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:49	7429-90-5	
Barium, Dissolved	463	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:49	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:49	7440-41-7	
Boron, Dissolved	131	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:49	7440-42-8	
Calcium, Dissolved	144000	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:49	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:49	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:49	7440-50-8	
Iron, Dissolved	25200	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:49	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:49	7439-92-1	
Lithium, Dissolved	57.7	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:49	7439-93-2	
Magnesium, Dissolved	47200	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:49	7439-95-4	
Manganese, Dissolved	1250	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:49	7439-96-5	
Molybdenum, Dissolved	<0.90	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:49	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:49	7440-02-0	
Potassium, Dissolved	8760	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:49	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:49	7440-22-4	
Sodium, Dissolved	26600	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:49	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:49	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:23	7440-36-0	
Arsenic	24.8	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:23	7440-38-2	
Cadmium	<0.033	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:23	7440-43-9	
Chromium	0.098J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:23	7440-47-3	B
Selenium	<0.085	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:23	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:23	7440-28-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B1 **Lab ID: 60285589004** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:00	7440-36-0	
Arsenic, Dissolved	28.7	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:00	7440-38-2	D9
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 20:00	7440-43-9	
Chromium, Dissolved	0.67J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 20:00	7440-47-3	
Selenium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 20:00	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 20:00	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	513	mg/L	20.0	4.9	1		11/12/18 15:58		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	652	mg/L	5.0	5.0	1		11/08/18 08:07		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	23.0	mg/L	0.050		1		11/13/18 16:34	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.49	mg/L	0.20	0.012	1		11/05/18 16:30		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	40.7	mg/L	10.0	2.9	10		11/17/18 03:37	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		11/17/18 03:21	16984-48-8	
Sulfate	42.5	mg/L	10.0	2.4	10		11/17/18 03:37	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.55	mg/L	0.10	0.050	1		11/08/18 12:50	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-2 **Lab ID: 60285589007** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	466	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 18:01	7429-90-5	
Barium	14.9	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 18:01	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 18:01	7440-41-7	
Boron	2510	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 18:01	7440-42-8	
Calcium	27100	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 18:01	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 18:01	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 18:01	7440-50-8	
Iron	11.6J	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 18:01	7439-89-6	B
Lead	<3.0	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 18:01	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 18:01	7439-93-2	
Magnesium	737	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 18:01	7439-95-4	
Manganese	51.2	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 18:01	7439-96-5	
Molybdenum	103	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 18:01	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 18:01	7440-02-0	
Potassium	6200	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 18:01	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 18:01	7440-22-4	
Sodium	109000	ug/L	500	157	1	11/07/18 10:32	11/07/18 18:01	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 18:01	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	350	ug/L	75.0	21.1	1	11/16/18 11:55	11/16/18 19:56	7429-90-5	
Barium, Dissolved	18.6	ug/L	5.0	1.5	1	11/16/18 11:55	11/16/18 19:56	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/16/18 11:55	11/16/18 19:56	7440-41-7	
Boron, Dissolved	2580	ug/L	100	12.5	1	11/16/18 11:55	11/16/18 19:56	7440-42-8	
Calcium, Dissolved	30700	ug/L	200	53.5	1	11/16/18 11:55	11/16/18 19:56	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 11:55	11/16/18 19:56	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 11:55	11/16/18 19:56	7440-50-8	
Iron, Dissolved	10.4J	ug/L	50.0	6.1	1	11/16/18 11:55	11/16/18 19:56	7439-89-6	B
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 11:55	11/16/18 19:56	7439-92-1	
Lithium, Dissolved	<4.6	ug/L	10.0	4.6	1	11/16/18 11:55	11/16/18 19:56	7439-93-2	
Magnesium, Dissolved	896	ug/L	50.0	14.0	1	11/16/18 11:55	11/16/18 19:56	7439-95-4	
Manganese, Dissolved	3.1J	ug/L	5.0	0.73	1	11/16/18 11:55	11/16/18 19:56	7439-96-5	
Molybdenum, Dissolved	113	ug/L	20.0	0.90	1	11/16/18 11:55	11/16/18 19:56	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/16/18 11:55	11/16/18 19:56	7440-02-0	
Potassium, Dissolved	6460	ug/L	500	79.3	1	11/16/18 11:55	11/16/18 19:56	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 11:55	11/16/18 19:56	7440-22-4	
Sodium, Dissolved	113000	ug/L	500	157	1	11/16/18 11:55	11/16/18 19:56	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 11:55	11/16/18 19:56	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.57J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:30	7440-36-0	
Arsenic	10.8	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:30	7440-38-2	
Cadmium	0.041J	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:30	7440-43-9	
Chromium	0.17J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:30	7440-47-3	B
Selenium	2.0	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:30	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:30	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-2 **Lab ID: 60285589007** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	0.50J	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:11	7440-36-0	
Arsenic, Dissolved	9.3	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:11	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 20:11	7440-43-9	
Chromium, Dissolved	0.35J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 20:11	7440-47-3	
Selenium, Dissolved	1.6	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 20:11	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 20:11	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	65.6	mg/L	20.0	4.9	1		11/12/18 16:26		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	438	mg/L	5.0	5.0	1		11/08/18 08:07		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.012J	mg/L	0.050		1		11/19/18 17:52	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	<0.012	mg/L	0.20	0.012	1		11/05/18 16:31		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	22.1	mg/L	2.0	0.58	2		11/17/18 06:17	16887-00-6	
Fluoride	0.36	mg/L	0.20	0.19	1		11/17/18 06:01	16984-48-8	
Sulfate	226	mg/L	20.0	4.8	20		11/17/18 06:33	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	<0.050	mg/L	0.10	0.050	1		11/08/18 12:55	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-1 **Lab ID:** 60285589008 Collected: 11/02/18 11:33 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Aluminum	<21.1	ug/L	75.0	21.1	1	11/07/18 10:32	11/07/18 18:03	7429-90-5	
Barium	<1.5	ug/L	5.0	1.5	1	11/07/18 10:32	11/07/18 18:03	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/07/18 10:32	11/07/18 18:03	7440-41-7	
Boron	26.1J	ug/L	100	12.5	1	11/07/18 10:32	11/07/18 18:03	7440-42-8	
Calcium	<53.5	ug/L	200	53.5	1	11/07/18 10:32	11/07/18 18:03	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/07/18 10:32	11/07/18 18:03	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/07/18 10:32	11/07/18 18:03	7440-50-8	
Iron	7.4J	ug/L	50.0	6.1	1	11/07/18 10:32	11/07/18 18:03	7439-89-6	B
Lead	<3.0	ug/L	10.0	3.0	1	11/07/18 10:32	11/07/18 18:03	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/07/18 10:32	11/07/18 18:03	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	11/07/18 10:32	11/07/18 18:03	7439-95-4	
Manganese	<0.73	ug/L	5.0	0.73	1	11/07/18 10:32	11/07/18 18:03	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/07/18 10:32	11/07/18 18:03	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/07/18 10:32	11/07/18 18:03	7440-02-0	
Potassium	<79.3	ug/L	500	79.3	1	11/07/18 10:32	11/07/18 18:03	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/07/18 10:32	11/07/18 18:03	7440-22-4	
Sodium	<157	ug/L	500	157	1	11/07/18 10:32	11/07/18 18:03	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/07/18 10:32	11/07/18 18:03	7440-66-6	
200.8 MET ICPMS		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony	<0.078	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:32	7440-36-0	
Arsenic	<0.065	ug/L	1.0	0.065	1	11/07/18 16:32	11/14/18 18:32	7440-38-2	
Cadmium	<0.033	ug/L	0.50	0.033	1	11/07/18 16:32	11/14/18 18:32	7440-43-9	
Chromium	0.19J	ug/L	1.0	0.078	1	11/07/18 16:32	11/14/18 18:32	7440-47-3	B
Selenium	<0.085	ug/L	1.0	0.085	1	11/07/18 16:32	11/14/18 18:32	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/07/18 16:32	11/14/18 18:32	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	<4.9	mg/L	20.0	4.9	1		11/12/18 16:29		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		11/08/18 08:07		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.0074J	mg/L	0.050		1		11/19/18 17:52	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	<0.012	mg/L	0.20	0.012	1		11/05/18 16:31		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	0.37J	mg/L	1.0	0.29	1		11/17/18 06:49	16887-00-6	B
Fluoride	<0.19	mg/L	0.20	0.19	1		11/17/18 06:49	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		11/17/18 06:49	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-1 **Lab ID: 60285589008** Collected: 11/02/18 11:33 Received: 11/03/18 02:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	<0.050	mg/L	0.10	0.050	1		11/08/18 12:56	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-2 Lab ID: 60285463014 Collected: 11/05/18 11:55 Received: 11/06/18 04:09 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
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200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum	73.5J	ug/L	75.0	21.1	1	11/08/18 08:56	11/08/18 21:46	7429-90-5	
Barium	9.5	ug/L	5.0	1.5	1	11/08/18 08:56	11/08/18 21:46	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/08/18 08:56	11/08/18 21:46	7440-41-7	
Boron	3290	ug/L	100	12.5	1	11/08/18 08:56	11/08/18 21:46	7440-42-8	
Calcium	8840	ug/L	200	53.5	1	11/08/18 08:56	11/08/18 21:46	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/08/18 08:56	11/08/18 21:46	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/08/18 08:56	11/08/18 21:46	7440-50-8	
Iron	62.8	ug/L	50.0	6.1	1	11/08/18 08:56	11/08/18 21:46	7439-89-6	B
Lead	6.2J	ug/L	10.0	3.0	1	11/08/18 08:56	11/08/18 21:46	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/08/18 08:56	11/08/18 21:46	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	11/08/18 08:56	11/08/18 21:46	7439-95-4	
Manganese	3.9J	ug/L	5.0	0.73	1	11/08/18 08:56	11/08/18 21:46	7439-96-5	
Molybdenum	170	ug/L	20.0	0.90	1	11/08/18 08:56	11/08/18 21:46	7439-98-7	
Nickel	5.1	ug/L	5.0	1.4	1	11/08/18 08:56	11/08/18 21:46	7440-02-0	
Potassium	3260	ug/L	500	79.3	1	11/08/18 08:56	11/08/18 21:46	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/08/18 08:56	11/08/18 21:46	7440-22-4	
Sodium	246000	ug/L	500	157	1	11/08/18 08:56	11/08/18 21:46	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/08/18 08:56	11/08/18 21:46	7440-66-6	

200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7

Aluminum, Dissolved	28.2J	ug/L	75.0	21.1	1	11/16/18 15:08	11/20/18 18:09	7429-90-5	
Barium, Dissolved	12.8	ug/L	5.0	1.5	1	11/16/18 15:08	11/20/18 18:09	7440-39-3	D9
Beryllium, Dissolved	0.34J	ug/L	1.0	0.16	1	11/16/18 15:08	11/20/18 18:09	7440-41-7	B
Boron, Dissolved	3160	ug/L	100	12.5	1	11/16/18 15:08	11/20/18 18:09	7440-42-8	
Calcium, Dissolved	9380	ug/L	200	53.5	1	11/16/18 15:08	11/20/18 18:09	7440-70-2	D9
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/16/18 15:08	11/20/18 18:09	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/16/18 15:08	11/20/18 18:09	7440-50-8	
Iron, Dissolved	26.9J	ug/L	50.0	6.1	1	11/16/18 15:08	11/20/18 18:09	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/16/18 15:08	11/20/18 18:09	7439-92-1	
Lithium, Dissolved	<4.6	ug/L	10.0	4.6	1	11/16/18 15:08	11/20/18 18:09	7439-93-2	
Magnesium, Dissolved	<14.0	ug/L	50.0	14.0	1	11/16/18 15:08	11/20/18 18:09	7439-95-4	
Manganese, Dissolved	2.9J	ug/L	5.0	0.73	1	11/16/18 15:08	11/20/18 18:09	7439-96-5	
Molybdenum, Dissolved	193	ug/L	20.0	0.90	1	11/16/18 15:08	11/20/18 18:09	7439-98-7	D9
Nickel, Dissolved	4.5J	ug/L	5.0	1.4	1	11/16/18 15:08	11/20/18 18:09	7440-02-0	
Potassium, Dissolved	3310	ug/L	500	79.3	1	11/16/18 15:08	11/20/18 18:09	7440-09-7	D9
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/16/18 15:08	11/20/18 18:09	7440-22-4	
Sodium, Dissolved	244000	ug/L	500	157	1	11/16/18 15:08	11/20/18 18:09	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/16/18 15:08	11/20/18 18:09	7440-66-6	

200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8

Antimony	3.8	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:26	7440-36-0	
Arsenic	197	ug/L	1.0	0.065	1	11/09/18 07:00	11/14/18 17:26	7440-38-2	
Cadmium	0.26J	ug/L	0.50	0.033	1	11/09/18 07:00	11/14/18 17:26	7440-43-9	
Chromium	0.48J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:26	7440-47-3	B
Selenium	0.88J	ug/L	1.0	0.085	1	11/09/18 07:00	11/14/18 17:26	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/09/18 07:00	11/14/18 17:26	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-2 **Lab ID: 60285463014** Collected: 11/05/18 11:55 Received: 11/06/18 04:09 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	1.5	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:13	7440-36-0	
Arsenic, Dissolved	156	ug/L	1.0	0.15	1	11/07/18 14:42	11/08/18 20:13	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/07/18 14:42	11/08/18 20:13	7440-43-9	
Chromium, Dissolved	0.32J	ug/L	1.0	0.19	1	11/07/18 14:42	11/08/18 20:13	7440-47-3	
Selenium, Dissolved	0.42J	ug/L	1.0	0.16	1	11/07/18 14:42	11/08/18 20:13	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/07/18 14:42	11/08/18 20:13	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	168	mg/L	20.0	4.9	1		11/14/18 13:43		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	768	mg/L	5.0	5.0	1		11/09/18 10:14		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.0J	mg/L	0.050		1		11/19/18 17:52	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	0.14J	mg/L	0.20	0.012	1		11/06/18 15:53		1e,H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	23.4	mg/L	2.0	0.58	2		11/20/18 20:47	16887-00-6	
Fluoride	1.2	mg/L	0.20	0.19	1		11/20/18 20:31	16984-48-8	
Sulfate	318	mg/L	50.0	12.0	50		12/08/18 04:18	14808-79-8	H1
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.19	mg/L	0.10	0.050	1		11/08/18 13:30	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-6 Lab ID: 60285463019 Collected: 11/06/18 09:10 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	47.3J	ug/L	75.0	21.1	1	11/08/18 14:29	11/16/18 17:52	7429-90-5	
Barium	105	ug/L	5.0	1.5	1	11/08/18 14:29	11/16/18 17:52	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/08/18 14:29	11/16/18 17:52	7440-41-7	
Boron	887	ug/L	100	12.5	1	11/08/18 14:29	11/16/18 17:52	7440-42-8	
Calcium	86800	ug/L	200	53.5	1	11/08/18 14:29	11/16/18 17:52	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/08/18 14:29	11/16/18 17:52	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/08/18 14:29	11/16/18 17:52	7440-50-8	
Iron	193	ug/L	50.0	6.1	1	11/08/18 14:29	11/16/18 17:52	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/08/18 14:29	11/16/18 17:52	7439-92-1	
Lithium	5.1J	ug/L	10.0	4.6	1	11/08/18 14:29	11/16/18 17:52	7439-93-2	
Magnesium	12900	ug/L	50.0	14.0	1	11/08/18 14:29	11/16/18 17:52	7439-95-4	
Manganese	86.8	ug/L	5.0	0.73	1	11/08/18 14:29	11/16/18 17:52	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/08/18 14:29	11/16/18 17:52	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/08/18 14:29	11/16/18 17:52	7440-02-0	
Potassium	1450	ug/L	500	79.3	1	11/08/18 14:29	11/16/18 17:52	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/08/18 14:29	11/16/18 17:52	7440-22-4	
Sodium	16100	ug/L	500	157	1	11/08/18 14:29	11/16/18 17:52	7440-23-5	
Zinc	5.1J	ug/L	50.0	3.5	1	11/08/18 14:29	11/16/18 17:52	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	<21.1	ug/L	75.0	21.1	1	11/19/18 16:33	11/27/18 15:14	7429-90-5	
Barium, Dissolved	101	ug/L	5.0	1.5	1	11/19/18 16:33	11/27/18 15:14	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/19/18 16:33	11/27/18 15:14	7440-41-7	
Boron, Dissolved	918	ug/L	100	12.5	1	11/19/18 16:33	11/27/18 15:14	7440-42-8	D9
Calcium, Dissolved	85200	ug/L	200	53.5	1	11/19/18 16:33	11/27/18 15:14	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/19/18 16:33	11/27/18 15:14	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/19/18 16:33	11/27/18 15:14	7440-50-8	
Iron, Dissolved	189	ug/L	50.0	6.1	1	11/19/18 16:33	11/27/18 15:14	7439-89-6	
Lead, Dissolved	<3.0	ug/L	10.0	3.0	1	11/19/18 16:33	11/27/18 15:14	7439-92-1	
Lithium, Dissolved	11.7	ug/L	10.0	4.6	1	11/19/18 16:33	11/27/18 15:14	7439-93-2	D9
Magnesium, Dissolved	12600	ug/L	50.0	14.0	1	11/19/18 16:33	11/27/18 15:14	7439-95-4	
Manganese, Dissolved	85.2	ug/L	5.0	0.73	1	11/19/18 16:33	11/27/18 15:14	7439-96-5	
Molybdenum, Dissolved	<0.90	ug/L	20.0	0.90	1	11/19/18 16:33	11/27/18 15:14	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/19/18 16:33	11/27/18 15:14	7440-02-0	
Potassium, Dissolved	1300	ug/L	500	79.3	1	11/19/18 16:33	11/27/18 15:14	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/19/18 16:33	11/27/18 15:14	7440-22-4	
Sodium, Dissolved	14400	ug/L	500	157	1	11/19/18 16:33	11/27/18 15:14	7440-23-5	
Zinc, Dissolved	4.0J	ug/L	50.0	3.5	1	11/19/18 16:33	11/27/18 15:14	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.11J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:35	7440-36-0	
Arsenic	0.61J	ug/L	1.0	0.065	1	11/09/18 07:00	11/14/18 17:35	7440-38-2	
Cadmium	0.071J	ug/L	0.50	0.033	1	11/09/18 07:00	11/14/18 17:35	7440-43-9	
Chromium	0.44J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:35	7440-47-3	B
Selenium	0.41J	ug/L	1.0	0.085	1	11/09/18 07:00	11/14/18 17:35	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/09/18 07:00	11/14/18 17:35	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-6 **Lab ID: 60285463019** Collected: 11/06/18 09:10 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/15/18 11:26	11/16/18 15:25	7440-36-0	
Arsenic, Dissolved	0.41J	ug/L	1.0	0.15	1	11/15/18 11:26	11/16/18 15:25	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/15/18 11:26	11/16/18 15:25	7440-43-9	
Chromium, Dissolved	<0.19	ug/L	1.0	0.19	1	11/15/18 11:26	11/16/18 15:25	7440-47-3	
Selenium, Dissolved	0.36J	ug/L	1.0	0.16	1	11/15/18 11:26	11/16/18 15:25	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/15/18 11:26	11/16/18 15:25	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	263	mg/L	20.0	4.9	1		11/15/18 14:22		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	290	mg/L	5.0	5.0	1		11/12/18 14:11		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	0.19	mg/L	0.050	0.012	1		12/03/18 14:44	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	<0.012	mg/L	0.20	0.012	1		11/07/18 12:59		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	6.3	mg/L	1.0	0.29	1		11/19/18 17:33	16887-00-6	
Fluoride	0.26	mg/L	0.20	0.19	1		11/19/18 17:33	16984-48-8	
Sulfate	22.8	mg/L	2.0	0.48	2		11/19/18 17:48	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.20	mg/L	0.10	0.050	1		11/13/18 09:02	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B2 Lab ID: 60285463020 Collected: 11/06/18 10:50 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	114	ug/L	75.0	21.1	1	11/08/18 14:29	11/16/18 17:54	7429-90-5	
Barium	415	ug/L	5.0	1.5	1	11/08/18 14:29	11/16/18 17:54	7440-39-3	
Beryllium	<0.16	ug/L	1.0	0.16	1	11/08/18 14:29	11/16/18 17:54	7440-41-7	
Boron	35.9J	ug/L	100	12.5	1	11/08/18 14:29	11/16/18 17:54	7440-42-8	
Calcium	109000	ug/L	200	53.5	1	11/08/18 14:29	11/16/18 17:54	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/08/18 14:29	11/16/18 17:54	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/08/18 14:29	11/16/18 17:54	7440-50-8	
Iron	9110	ug/L	50.0	6.1	1	11/08/18 14:29	11/16/18 17:54	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/08/18 14:29	11/16/18 17:54	7439-92-1	
Lithium	14.3	ug/L	10.0	4.6	1	11/08/18 14:29	11/16/18 17:54	7439-93-2	
Magnesium	19900	ug/L	50.0	14.0	1	11/08/18 14:29	11/16/18 17:54	7439-95-4	
Manganese	256	ug/L	5.0	0.73	1	11/08/18 14:29	11/16/18 17:54	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/08/18 14:29	11/16/18 17:54	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/08/18 14:29	11/16/18 17:54	7440-02-0	
Potassium	2200	ug/L	500	79.3	1	11/08/18 14:29	11/16/18 17:54	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/08/18 14:29	11/16/18 17:54	7440-22-4	
Sodium	24600	ug/L	500	157	1	11/08/18 14:29	11/16/18 17:54	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/08/18 14:29	11/16/18 17:54	7440-66-6	
200.7 Metals, Dissolved Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum, Dissolved	<21.1	ug/L	75.0	21.1	1	11/19/18 16:33	11/27/18 15:16	7429-90-5	
Barium, Dissolved	401	ug/L	5.0	1.5	1	11/19/18 16:33	11/27/18 15:16	7440-39-3	
Beryllium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/19/18 16:33	11/27/18 15:16	7440-41-7	
Boron, Dissolved	54.0J	ug/L	100	12.5	1	11/19/18 16:33	11/27/18 15:16	7440-42-8	
Calcium, Dissolved	108000	ug/L	200	53.5	1	11/19/18 16:33	11/27/18 15:16	7440-70-2	
Cobalt, Dissolved	<0.87	ug/L	5.0	0.87	1	11/19/18 16:33	11/27/18 15:16	7440-48-4	
Copper, Dissolved	<4.5	ug/L	15.0	4.5	1	11/19/18 16:33	11/27/18 15:16	7440-50-8	
Iron, Dissolved	9270	ug/L	50.0	6.1	1	11/19/18 16:33	11/27/18 15:16	7439-89-6	D9
Lead, Dissolved	3.2J	ug/L	10.0	3.0	1	11/19/18 16:33	11/27/18 15:16	7439-92-1	
Lithium, Dissolved	5.9J	ug/L	10.0	4.6	1	11/19/18 16:33	11/27/18 15:16	7439-93-2	
Magnesium, Dissolved	19800	ug/L	50.0	14.0	1	11/19/18 16:33	11/27/18 15:16	7439-95-4	
Manganese, Dissolved	250	ug/L	5.0	0.73	1	11/19/18 16:33	11/27/18 15:16	7439-96-5	
Molybdenum, Dissolved	<0.90	ug/L	20.0	0.90	1	11/19/18 16:33	11/27/18 15:16	7439-98-7	
Nickel, Dissolved	<1.4	ug/L	5.0	1.4	1	11/19/18 16:33	11/27/18 15:16	7440-02-0	
Potassium, Dissolved	1910	ug/L	500	79.3	1	11/19/18 16:33	11/27/18 15:16	7440-09-7	
Silver, Dissolved	<2.0	ug/L	7.0	2.0	1	11/19/18 16:33	11/27/18 15:16	7440-22-4	
Sodium, Dissolved	23300	ug/L	500	157	1	11/19/18 16:33	11/27/18 15:16	7440-23-5	
Zinc, Dissolved	<3.5	ug/L	50.0	3.5	1	11/19/18 16:33	11/27/18 15:16	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	<0.078	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:37	7440-36-0	
Arsenic	2.2	ug/L	1.0	0.065	1	11/09/18 07:00	11/14/18 17:37	7440-38-2	
Cadmium	<0.033	ug/L	0.50	0.033	1	11/09/18 07:00	11/14/18 17:37	7440-43-9	
Chromium	0.13J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:37	7440-47-3	B
Selenium	0.10J	ug/L	1.0	0.085	1	11/09/18 07:00	11/14/18 17:37	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/09/18 07:00	11/14/18 17:37	7440-28-0	

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B2 **Lab ID: 60285463020** Collected: 11/06/18 10:50 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.8 MET ICPMS, Dissolved		Analytical Method: EPA 200.8 Preparation Method: EPA 200.8							
Antimony, Dissolved	<0.15	ug/L	1.0	0.15	1	11/15/18 11:26	11/16/18 15:27	7440-36-0	
Arsenic, Dissolved	2.2	ug/L	1.0	0.15	1	11/15/18 11:26	11/16/18 15:27	7440-38-2	
Cadmium, Dissolved	<0.070	ug/L	0.50	0.070	1	11/15/18 11:26	11/16/18 15:27	7440-43-9	
Chromium, Dissolved	<0.19	ug/L	1.0	0.19	1	11/15/18 11:26	11/16/18 15:27	7440-47-3	
Selenium, Dissolved	<0.16	ug/L	1.0	0.16	1	11/15/18 11:26	11/16/18 15:27	7782-49-2	
Thallium, Dissolved	<0.14	ug/L	1.0	0.14	1	11/15/18 11:26	11/16/18 15:27	7440-28-0	
2320B Alkalinity		Analytical Method: SM 2320B							
Alkalinity, Total as CaCO3	347	mg/L	20.0	4.9	1		11/15/18 14:32		
2540C Total Dissolved Solids		Analytical Method: SM 2540C							
Total Dissolved Solids	425	mg/L	5.0	5.0	1		11/12/18 14:11		
Iron, Ferric (Calculation)		Analytical Method: SM 3500-Fe B#4							
Iron, Ferric	7.0	mg/L	0.050	0.012	1		12/03/18 14:44	7439-89-6	
Iron, Ferrous		Analytical Method: SM 3500-Fe B#4							
Iron, Ferrous	2.1	mg/L	0.20	0.012	1		11/07/18 13:10		H6
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Chloride	40.2	mg/L	5.0	1.4	5		11/19/18 18:16	16887-00-6	
Fluoride	0.22	mg/L	0.20	0.19	1		11/19/18 18:02	16984-48-8	
Sulfate	13.1	mg/L	1.0	0.24	1		11/19/18 18:02	14808-79-8	
365.4 Total Phosphorus		Analytical Method: EPA 365.4							
Phosphorus	0.38	mg/L	0.10	0.050	1		11/13/18 09:12	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-2 **Lab ID:** 60285463021 Collected: 11/06/18 09:00 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Aluminum	<21.1	ug/L	75.0	21.1	1	11/08/18 14:29	11/16/18 18:41	7429-90-5	
Barium	<1.5	ug/L	5.0	1.5	1	11/08/18 14:29	11/16/18 18:41	7440-39-3	
Beryllium	0.20J	ug/L	1.0	0.16	1	11/08/18 14:29	11/16/18 18:41	7440-41-7	B
Boron	<12.5	ug/L	100	12.5	1	11/08/18 14:29	11/16/18 18:41	7440-42-8	
Calcium	<53.5	ug/L	200	53.5	1	11/08/18 14:29	11/16/18 18:41	7440-70-2	
Cobalt	<0.87	ug/L	5.0	0.87	1	11/08/18 14:29	11/16/18 18:41	7440-48-4	
Copper	<4.5	ug/L	10.0	4.5	1	11/08/18 14:29	11/16/18 18:41	7440-50-8	
Iron	<6.1	ug/L	50.0	6.1	1	11/08/18 14:29	11/16/18 18:41	7439-89-6	
Lead	<3.0	ug/L	10.0	3.0	1	11/08/18 14:29	11/16/18 18:41	7439-92-1	
Lithium	<4.6	ug/L	10.0	4.6	1	11/08/18 14:29	11/16/18 18:41	7439-93-2	
Magnesium	<14.0	ug/L	50.0	14.0	1	11/08/18 14:29	11/16/18 18:41	7439-95-4	
Manganese	<0.73	ug/L	5.0	0.73	1	11/08/18 14:29	11/16/18 18:41	7439-96-5	
Molybdenum	<0.90	ug/L	20.0	0.90	1	11/08/18 14:29	11/16/18 18:41	7439-98-7	
Nickel	<1.4	ug/L	5.0	1.4	1	11/08/18 14:29	11/16/18 18:41	7440-02-0	
Potassium	<79.3	ug/L	500	79.3	1	11/08/18 14:29	11/16/18 18:41	7440-09-7	
Silver	<2.0	ug/L	7.0	2.0	1	11/08/18 14:29	11/16/18 18:41	7440-22-4	
Sodium	318J	ug/L	500	157	1	11/08/18 14:29	11/16/18 18:41	7440-23-5	
Zinc	<3.5	ug/L	50.0	3.5	1	11/08/18 14:29	11/16/18 18:41	7440-66-6	
200.8 MET ICPMS Analytical Method: EPA 200.8 Preparation Method: EPA 200.8									
Antimony	0.092J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:38	7440-36-0	
Arsenic	0.26J	ug/L	1.0	0.065	1	11/09/18 07:00	11/14/18 17:38	7440-38-2	
Cadmium	0.040J	ug/L	0.50	0.033	1	11/09/18 07:00	11/14/18 17:38	7440-43-9	
Chromium	0.52J	ug/L	1.0	0.078	1	11/09/18 07:00	11/14/18 17:38	7440-47-3	B
Selenium	0.12J	ug/L	1.0	0.085	1	11/09/18 07:00	11/14/18 17:38	7782-49-2	
Thallium	<0.099	ug/L	1.0	0.099	1	11/09/18 07:00	11/14/18 17:38	7440-28-0	
2320B Alkalinity Analytical Method: SM 2320B									
Alkalinity, Total as CaCO3	<4.9	mg/L	20.0	4.9	1		11/15/18 14:36		
2540C Total Dissolved Solids Analytical Method: SM 2540C									
Total Dissolved Solids	<5.0	mg/L	5.0	5.0	1		11/12/18 14:11		
Iron, Ferric (Calculation) Analytical Method: SM 3500-Fe B#4									
Iron, Ferric	<0.012	mg/L	0.050	0.012	1		12/03/18 14:44	7439-89-6	
Iron, Ferrous Analytical Method: SM 3500-Fe B#4									
Iron, Ferrous	<0.012	mg/L	0.20	0.012	1		11/10/18 12:11		H6
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Chloride	<0.29	mg/L	1.0	0.29	1		11/19/18 18:30	16887-00-6	
Fluoride	<0.19	mg/L	0.20	0.19	1		11/19/18 18:30	16984-48-8	
Sulfate	<0.24	mg/L	1.0	0.24	1		11/19/18 18:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-2 **Lab ID: 60285463021** Collected: 11/06/18 09:00 Received: 11/07/18 03:58 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
365.4 Total Phosphorus									
Analytical Method: EPA 365.4									
Phosphorus	<0.050	mg/L	0.10	0.050	1		11/13/18 09:13	7723-14-0	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553504

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60285463001, 60285463002, 60285463003

METHOD BLANK: 2269780

Matrix: Water

Associated Lab Samples: 60285463001, 60285463002, 60285463003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	ug/L	22.2J	75.0	21.1	11/07/18 15:28	
Barium	ug/L	<1.5	5.0	1.5	11/07/18 15:28	
Beryllium	ug/L	<0.16	1.0	0.16	11/07/18 15:28	
Boron	ug/L	<12.5	100	12.5	11/07/18 15:28	
Calcium	ug/L	<53.5	200	53.5	11/07/18 15:28	
Cobalt	ug/L	<0.87	5.0	0.87	11/07/18 15:28	
Copper	ug/L	<4.5	10.0	4.5	11/07/18 15:28	
Iron	ug/L	<6.1	50.0	6.1	11/07/18 15:28	
Lead	ug/L	<3.0	10.0	3.0	11/07/18 15:28	
Lithium	ug/L	<4.6	10.0	4.6	11/07/18 15:28	
Magnesium	ug/L	<14.0	50.0	14.0	11/07/18 15:28	
Manganese	ug/L	<0.73	5.0	0.73	11/07/18 15:28	
Molybdenum	ug/L	<0.90	20.0	0.90	11/07/18 15:28	
Nickel	ug/L	<1.4	5.0	1.4	11/07/18 15:28	
Potassium	ug/L	<79.3	500	79.3	11/07/18 15:28	
Silver	ug/L	<2.0	7.0	2.0	11/07/18 15:28	
Sodium	ug/L	<157	500	157	11/07/18 15:28	
Zinc	ug/L	<3.5	50.0	3.5	11/07/18 15:28	

LABORATORY CONTROL SAMPLE: 2269781

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	10000	9390	94	85-115	
Barium	ug/L	1000	976	98	85-115	
Beryllium	ug/L	1000	931	93	85-115	
Boron	ug/L	1000	958	96	85-115	
Calcium	ug/L	10000	9380	94	85-115	
Cobalt	ug/L	1000	950	95	85-115	
Copper	ug/L	1000	953	95	85-115	
Iron	ug/L	10000	9500	95	85-115	
Lead	ug/L	1000	951	95	85-115	
Lithium	ug/L	1000	976	98	85-115	
Magnesium	ug/L	10000	9590	96	85-115	
Manganese	ug/L	1000	940	94	85-115	
Molybdenum	ug/L	1000	970	97	85-115	
Nickel	ug/L	1000	962	96	85-115	
Potassium	ug/L	10000	9720	97	85-115	
Silver	ug/L	500	486	97	85-115	
Sodium	ug/L	10000	9620	96	85-115	
Zinc	ug/L	1000	931	93	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285463002		2269782		2269783		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Aluminum	ug/L	138	20000	20000	9640	9300	48	46	70-130	4	20	M1		
Barium	ug/L	378	2000	2000	1340	1300	48	46	70-130	3	20	M1		
Beryllium	ug/L	<0.16	2000	2000	936	904	47	45	70-130	4	20	M1		
Boron	ug/L	115	2000	2000	1080	1050	48	47	70-130	3	20	M1		
Calcium	ug/L	130000	20000	20000	136000	132000	34	14	70-130	3	20	M1		
Cobalt	ug/L	<0.87	2000	2000	921	899	46	45	70-130	2	20	M1		
Copper	ug/L	<4.5	2000	2000	959	935	48	47	70-130	3	20	M1		
Iron	ug/L	11400	20000	20000	20200	19600	44	41	70-130	3	20	M1		
Lead	ug/L	<3.0	2000	2000	924	897	46	45	70-130	3	20	M1		
Lithium	ug/L	8.6J	2000	2000	993	963	49	48	70-130	3	20	M1		
Magnesium	ug/L	17800	20000	20000	26400	25800	43	40	70-130	2	20	M1		
Manganese	ug/L	445	2000	2000	1360	1320	46	44	70-130	3	20	M1		
Molybdenum	ug/L	<0.90	2000	2000	967	946	48	47	70-130	2	20	M1		
Nickel	ug/L	<1.4	2000	2000	925	903	46	45	70-130	2	20	M1		
Potassium	ug/L	2200	20000	20000	12000	11700	49	47	70-130	3	20	M1		
Silver	ug/L	<2.0	1000	1000	484	470	48	47	70-130	3	20	M1		
Sodium	ug/L	4740	20000	20000	14400	13900	48	46	70-130	3	20	M1		
Zinc	ug/L	5.2J	2000	2000	914	890	45	44	70-130	3	20	M1		

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553881 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
 Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2271171 Matrix: Water
 Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	ug/L	<21.1	75.0	21.1	11/07/18 17:23	
Barium	ug/L	<1.5	5.0	1.5	11/07/18 17:23	
Beryllium	ug/L	0.27J	1.0	0.16	11/07/18 17:23	
Boron	ug/L	<12.5	100	12.5	11/07/18 17:23	
Calcium	ug/L	<53.5	200	53.5	11/07/18 17:23	
Cobalt	ug/L	<0.87	5.0	0.87	11/07/18 17:23	
Copper	ug/L	<4.5	10.0	4.5	11/07/18 17:23	
Iron	ug/L	6.8J	50.0	6.1	11/07/18 17:23	
Lead	ug/L	<3.0	10.0	3.0	11/07/18 17:23	
Lithium	ug/L	<4.6	10.0	4.6	11/07/18 17:23	
Magnesium	ug/L	<14.0	50.0	14.0	11/07/18 17:23	
Manganese	ug/L	<0.73	5.0	0.73	11/07/18 17:23	
Molybdenum	ug/L	<0.90	20.0	0.90	11/07/18 17:23	
Nickel	ug/L	<1.4	5.0	1.4	11/07/18 17:23	
Potassium	ug/L	212J	500	79.3	11/07/18 17:23	
Silver	ug/L	<2.0	7.0	2.0	11/07/18 17:23	
Sodium	ug/L	<157	500	157	11/07/18 17:23	
Zinc	ug/L	<3.5	50.0	3.5	11/07/18 17:23	

LABORATORY CONTROL SAMPLE: 2271172

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	10000	9520	95	85-115	
Barium	ug/L	1000	966	97	85-115	
Beryllium	ug/L	1000	915	91	85-115	
Boron	ug/L	1000	959	96	85-115	
Calcium	ug/L	10000	9210	92	85-115	
Cobalt	ug/L	1000	953	95	85-115	
Copper	ug/L	1000	964	96	85-115	
Iron	ug/L	10000	9270	93	85-115	
Lead	ug/L	1000	949	95	85-115	
Lithium	ug/L	1000	987	99	85-115	
Magnesium	ug/L	10000	9620	96	85-115	
Manganese	ug/L	1000	920	92	85-115	
Molybdenum	ug/L	1000	971	97	85-115	
Nickel	ug/L	1000	951	95	85-115	
Potassium	ug/L	10000	10000	100	85-115	
Silver	ug/L	500	483	97	85-115	
Sodium	ug/L	10000	9860	99	85-115	
Zinc	ug/L	1000	936	94	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271173												2271174	
Parameter	Units	60285588004 Result	MS	MSD	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual	
			Spike Conc.	Spike Conc.									
Aluminum	ug/L	46.0J	10000	10000	9530	9440	95	94	70-130	1	20		
Barium	ug/L	116	1000	1000	1060	1060	95	94	70-130	1	20		
Beryllium	ug/L	<0.16	1000	1000	909	906	91	91	70-130	0	20		
Boron	ug/L	572	1000	1000	1530	1510	96	94	70-130	1	20		
Calcium	ug/L	60300	10000	10000	69700	69200	94	89	70-130	1	20		
Cobalt	ug/L	<0.87	1000	1000	919	914	92	91	70-130	1	20		
Copper	ug/L	4.8J	1000	1000	941	939	94	93	70-130	0	20		
Iron	ug/L	1750	10000	10000	10800	10800	91	90	70-130	0	20		
Lead	ug/L	<3.0	1000	1000	903	900	90	90	70-130	0	20		
Lithium	ug/L	23.2	1000	1000	989	985	97	96	70-130	0	20		
Magnesium	ug/L	11000	10000	10000	20200	20000	92	90	70-130	1	20		
Manganese	ug/L	371	1000	1000	1260	1260	89	89	70-130	1	20		
Molybdenum	ug/L	33.8	1000	1000	996	991	96	96	70-130	1	20		
Nickel	ug/L	<1.4	1000	1000	913	912	91	91	70-130	0	20		
Potassium	ug/L	5860	10000	10000	15400	15200	95	94	70-130	1	20		
Silver	ug/L	<2.0	500	500	471	469	94	94	70-130	1	20		
Sodium	ug/L	54600	10000	10000	64700	64100	101	94	70-130	1	20		
Zinc	ug/L	<3.5	1000	1000	913	908	91	90	70-130	1	20		

MATRIX SPIKE SAMPLE: 2271175											
Parameter	Units	60285589001 Result	Spike Conc.	MS	MS	% Rec Limits	Qualifiers				
				Result	% Rec						
Aluminum	ug/L		422	10000	9790	94	70-130				
Barium	ug/L		15.1	1000	959	94	70-130				
Beryllium	ug/L		<0.16	1000	908	91	70-130				
Boron	ug/L		2470	1000	3440	96	70-130				
Calcium	ug/L		26800	10000	36100	94	70-130				
Cobalt	ug/L		0.92J	1000	917	92	70-130				
Copper	ug/L		<4.5	1000	941	94	70-130				
Iron	ug/L		13.1J	10000	9120	91	70-130				
Lead	ug/L		<3.0	1000	898	90	70-130				
Lithium	ug/L		<4.6	1000	973	97	70-130				
Magnesium	ug/L		753	10000	9940	92	70-130				
Manganese	ug/L		2.3J	1000	892	89	70-130				
Molybdenum	ug/L		102	1000	1060	96	70-130				
Nickel	ug/L		<1.4	1000	913	91	70-130				
Potassium	ug/L		6080	10000	15600	96	70-130				
Silver	ug/L		<2.0	500	466	93	70-130				
Sodium	ug/L		107000	10000	120000	125	70-130				
Zinc	ug/L		<3.5	1000	917	92	70-130				

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554059

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60285463014

METHOD BLANK: 2272160

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	ug/L	<21.1	75.0	21.1	11/08/18 20:39	
Barium	ug/L	<1.5	5.0	1.5	11/08/18 20:39	
Beryllium	ug/L	<0.16	1.0	0.16	11/08/18 20:39	
Boron	ug/L	<12.5	100	12.5	11/08/18 20:39	
Calcium	ug/L	<53.5	200	53.5	11/08/18 20:39	
Cobalt	ug/L	<0.87	5.0	0.87	11/08/18 20:39	
Copper	ug/L	<4.5	10.0	4.5	11/08/18 20:39	
Iron	ug/L	9.6J	50.0	6.1	11/09/18 17:27	
Lead	ug/L	<3.0	10.0	3.0	11/08/18 20:39	
Lithium	ug/L	<4.6	10.0	4.6	11/08/18 20:39	
Magnesium	ug/L	<14.0	50.0	14.0	11/08/18 20:39	
Manganese	ug/L	<0.73	5.0	0.73	11/08/18 20:39	
Molybdenum	ug/L	<0.90	20.0	0.90	11/08/18 20:39	
Nickel	ug/L	<1.4	5.0	1.4	11/08/18 20:39	
Potassium	ug/L	159J	500	79.3	11/08/18 20:39	
Silver	ug/L	<2.0	7.0	2.0	11/08/18 20:39	
Sodium	ug/L	<157	500	157	11/08/18 20:39	
Zinc	ug/L	<3.5	50.0	3.5	11/08/18 20:39	

LABORATORY CONTROL SAMPLE: 2272161

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	10000	9810	98	85-115	
Barium	ug/L	1000	968	97	85-115	
Beryllium	ug/L	1000	904	90	85-115	
Boron	ug/L	1000	984	98	85-115	
Calcium	ug/L	10000	9280	93	85-115	
Cobalt	ug/L	1000	1010	101	85-115	
Copper	ug/L	1000	996	100	85-115	
Iron	ug/L	10000	10100	101	85-115	
Lead	ug/L	1000	990	99	85-115	
Lithium	ug/L	1000	1010	101	85-115	
Magnesium	ug/L	10000	10300	103	85-115	
Manganese	ug/L	1000	909	91	85-115	
Molybdenum	ug/L	1000	1040	104	85-115	
Nickel	ug/L	1000	967	97	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Silver	ug/L	500	496	99	85-115	
Sodium	ug/L	10000	10300	103	85-115	
Zinc	ug/L	1000	1010	101	85-115	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285463014		2272162		2272163		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Aluminum	ug/L	73.5J	10000	10000	9370	9830	93	98	70-130	5	20			
Barium	ug/L	9.5	1000	1000	928	970	92	96	70-130	4	20			
Beryllium	ug/L	<0.16	1000	1000	871	910	87	91	70-130	4	20			
Boron	ug/L	3290	1000	1000	4180	4240	89	94	70-130	1	20			
Calcium	ug/L	8840	10000	10000	17200	17700	84	88	70-130	3	20			
Cobalt	ug/L	<0.87	1000	1000	934	994	93	99	70-130	6	20			
Copper	ug/L	<4.5	1000	1000	955	1000	95	100	70-130	5	20			
Iron	ug/L	62.8	10000	10000	8720	9160	87	91	70-130	5	20			
Lead	ug/L	6.2J	1000	1000	902	954	90	95	70-130	6	20			
Lithium	ug/L	<4.6	1000	1000	973	1020	97	101	70-130	5	20			
Magnesium	ug/L	<14.0	10000	10000	9490	10000	95	100	70-130	6	20			
Manganese	ug/L	3.9J	1000	1000	865	909	86	91	70-130	5	20			
Molybdenum	ug/L	170	1000	1000	1150	1220	98	105	70-130	5	20			
Nickel	ug/L	5.1	1000	1000	890	946	88	94	70-130	6	20			
Potassium	ug/L	3260	10000	10000	12700	13200	94	99	70-130	4	20			
Silver	ug/L	<2.0	500	500	468	492	94	98	70-130	5	20			
Sodium	ug/L	246000	10000	10000	254000	253000	78	71	70-130	0	20			
Zinc	ug/L	<3.5	1000	1000	984	1050	98	104	70-130	6	20			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554168

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60285463019, 60285463020, 60285463021

METHOD BLANK: 2272758

Matrix: Water

Associated Lab Samples: 60285463019, 60285463020, 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum	ug/L	<21.1	75.0	21.1	11/16/18 16:57	
Barium	ug/L	<1.5	5.0	1.5	11/16/18 16:57	
Beryllium	ug/L	0.17J	1.0	0.16	11/16/18 16:57	
Boron	ug/L	<12.5	100	12.5	11/16/18 16:57	
Calcium	ug/L	<53.5	200	53.5	11/16/18 16:57	
Cobalt	ug/L	<0.87	5.0	0.87	11/16/18 16:57	
Copper	ug/L	<4.5	10.0	4.5	11/16/18 16:57	
Iron	ug/L	<6.1	50.0	6.1	11/16/18 16:57	
Lead	ug/L	<3.0	10.0	3.0	11/16/18 16:57	
Lithium	ug/L	<4.6	10.0	4.6	11/16/18 16:57	
Magnesium	ug/L	<14.0	50.0	14.0	11/16/18 16:57	
Manganese	ug/L	<0.73	5.0	0.73	11/16/18 16:57	
Molybdenum	ug/L	<0.90	20.0	0.90	11/16/18 16:57	
Nickel	ug/L	<1.4	5.0	1.4	11/16/18 16:57	
Potassium	ug/L	<79.3	500	79.3	11/16/18 16:57	
Silver	ug/L	<2.0	7.0	2.0	11/16/18 16:57	
Sodium	ug/L	<157	500	157	11/16/18 16:57	
Zinc	ug/L	<3.5	50.0	3.5	11/16/18 16:57	

LABORATORY CONTROL SAMPLE: 2272759

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum	ug/L	10000	9870	99	85-115	
Barium	ug/L	1000	959	96	85-115	
Beryllium	ug/L	1000	980	98	85-115	
Boron	ug/L	1000	984	98	85-115	
Calcium	ug/L	10000	9960	100	85-115	
Cobalt	ug/L	1000	991	99	85-115	
Copper	ug/L	1000	1020	102	85-115	
Iron	ug/L	10000	9730	97	85-115	
Lead	ug/L	1000	990	99	85-115	
Lithium	ug/L	1000	961	96	85-115	
Magnesium	ug/L	10000	10400	104	85-115	
Manganese	ug/L	1000	1000	100	85-115	
Molybdenum	ug/L	1000	1000	100	85-115	
Nickel	ug/L	1000	976	98	85-115	
Potassium	ug/L	10000	9760	98	85-115	
Silver	ug/L	500	513	103	85-115	
Sodium	ug/L	10000	9920	99	85-115	
Zinc	ug/L	1000	978	98	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

MATRIX SPIKE SAMPLE: 2272760		60285895002	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum	ug/L	22500	10000	32200	97	70-130	
Barium	ug/L	44.1	1000	1010	96	70-130	
Beryllium	ug/L	<0.16	1000	984	98	70-130	
Boron	ug/L	6100	1000	6880	78	70-130	
Calcium	ug/L	25500	10000	34200	87	70-130	
Cobalt	ug/L	<0.87	1000	972	97	70-130	
Copper	ug/L	<4.5	1000	963	96	70-130	
Iron	ug/L	6.6J	10000	9780	98	70-130	
Lead	ug/L	<3.0	1000	935	94	70-130	
Lithium	ug/L	68.1	1000	1060	100	70-130	
Magnesium	ug/L	31.8J	10000	9700	97	70-130	
Manganese	ug/L	<0.73	1000	983	98	70-130	
Molybdenum	ug/L	258	1000	1260	100	70-130	
Nickel	ug/L	12.1	1000	978	97	70-130	
Potassium	ug/L	55100	10000	65000	99	70-130	
Silver	ug/L	<2.0	500	483	97	70-130	
Sodium	ug/L	377000	10000	381000	44	70-130	M1
Zinc	ug/L	3.9J	1000	1010	101	70-130	

MATRIX SPIKE SAMPLE: 2272761		60285674001	Spike	MS	MS	% Rec	
Parameter	Units	Result	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum	ug/L	145	10000	9810	97	70-130	
Barium	ug/L	63.4	1000	1020	96	70-130	
Beryllium	ug/L	ND	1000	958	96	70-130	
Boron	ug/L	3050	1000	3820	77	70-130	
Calcium	ug/L	418000	10000	417000	-8	70-130	M1
Cobalt	ug/L	ND	1000	896	90	70-130	
Copper	ug/L	ND	1000	968	97	70-130	
Iron	ug/L	ND	10000	9470	94	70-130	
Lead	ug/L	ND	1000	860	86	70-130	
Lithium	ug/L	2210	1000	3210	100	70-130	
Magnesium	ug/L	218000	10000	221000	33	70-130	M1
Manganese	ug/L	ND	1000	977	97	70-130	
Molybdenum	ug/L	ND	1000	977	97	70-130	
Nickel	ug/L	12.9	1000	901	89	70-130	
Potassium	ug/L	99000	10000	111000	116	70-130	
Silver	ug/L	ND	500	533	107	70-130	
Sodium	ug/L	5420000	10000	5270000	-1550	70-130	M1
Zinc	ug/L	ND	1000	963	95	70-130	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555618 Analysis Method: EPA 200.7
 QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Dissolved
 Associated Lab Samples: 60285463001, 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007

METHOD BLANK: 2279413 Matrix: Water
 Associated Lab Samples: 60285463001, 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<21.1	75.0	21.1	11/16/18 19:25	
Barium, Dissolved	ug/L	<1.5	5.0	1.5	11/16/18 19:25	
Beryllium, Dissolved	ug/L	<0.16	1.0	0.16	11/16/18 19:25	
Boron, Dissolved	ug/L	<12.5	100	12.5	11/16/18 19:25	
Calcium, Dissolved	ug/L	<53.5	200	53.5	11/16/18 19:25	
Cobalt, Dissolved	ug/L	<0.87	5.0	0.87	11/16/18 19:25	
Copper, Dissolved	ug/L	<4.5	15.0	4.5	11/16/18 19:25	
Iron, Dissolved	ug/L	10.3J	50.0	6.1	11/16/18 19:25	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	11/16/18 19:25	
Lithium, Dissolved	ug/L	<4.6	10.0	4.6	11/16/18 19:25	
Magnesium, Dissolved	ug/L	<14.0	50.0	14.0	11/16/18 19:25	
Manganese, Dissolved	ug/L	<0.73	5.0	0.73	11/16/18 19:25	
Molybdenum, Dissolved	ug/L	<0.90	20.0	0.90	11/16/18 19:25	
Nickel, Dissolved	ug/L	<1.4	5.0	1.4	11/16/18 19:25	
Potassium, Dissolved	ug/L	<79.3	500	79.3	11/16/18 19:25	
Silver, Dissolved	ug/L	<2.0	7.0	2.0	11/16/18 19:25	
Sodium, Dissolved	ug/L	216J	500	157	11/16/18 19:25	
Zinc, Dissolved	ug/L	<3.5	50.0	3.5	11/16/18 19:25	

LABORATORY CONTROL SAMPLE: 2279414

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	10000	9620	96	85-115	
Barium, Dissolved	ug/L	1000	955	95	85-115	
Beryllium, Dissolved	ug/L	1000	948	95	85-115	
Boron, Dissolved	ug/L	1000	937	94	85-115	
Calcium, Dissolved	ug/L	10000	9630	96	85-115	
Cobalt, Dissolved	ug/L	1000	998	100	85-115	
Copper, Dissolved	ug/L	1000	990	99	85-115	
Iron, Dissolved	ug/L	10000	9250	93	85-115	
Lead, Dissolved	ug/L	1000	985	99	85-115	
Lithium, Dissolved	ug/L	1000	971	97	85-115	
Magnesium, Dissolved	ug/L	10000	10000	100	85-115	
Manganese, Dissolved	ug/L	1000	986	99	85-115	
Molybdenum, Dissolved	ug/L	1000	1000	100	85-115	
Nickel, Dissolved	ug/L	1000	994	99	85-115	
Potassium, Dissolved	ug/L	10000	9690	97	85-115	
Silver, Dissolved	ug/L	500	493	99	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

LABORATORY CONTROL SAMPLE: 2279414

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sodium, Dissolved	ug/L	10000	10100	101	85-115	
Zinc, Dissolved	ug/L	1000	989	99	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2279415 2279416

Parameter	Units	60285463002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec					
Aluminum, Dissolved	ug/L	93.6	10000	10000	9750	9930	97	98	70-130	2	20		
Barium, Dissolved	ug/L	374	1000	1000	1340	1350	97	98	70-130	1	20		
Beryllium, Dissolved	ug/L	<0.16	1000	1000	971	988	97	99	70-130	2	20		
Boron, Dissolved	ug/L	101	1000	1000	1060	1070	96	97	70-130	1	20		
Calcium, Dissolved	ug/L	130000	10000	10000	142000	145000	123	148	70-130	2	20	M1	
Cobalt, Dissolved	ug/L	<0.87	1000	1000	962	982	96	98	70-130	2	20		
Copper, Dissolved	ug/L	<4.5	1000	1000	977	988	98	99	70-130	1	20		
Iron, Dissolved	ug/L	10700	10000	10000	20000	20300	93	96	70-130	2	20		
Lead, Dissolved	ug/L	<3.0	1000	1000	949	966	95	96	70-130	2	20		
Lithium, Dissolved	ug/L	10.2	1000	1000	1020	1030	101	102	70-130	2	20		
Magnesium, Dissolved	ug/L	17800	10000	10000	27700	28100	99	103	70-130	1	20		
Manganese, Dissolved	ug/L	446	1000	1000	1420	1440	97	99	70-130	2	20		
Molybdenum, Dissolved	ug/L	<0.90	1000	1000	1000	1020	100	102	70-130	2	20		
Nickel, Dissolved	ug/L	<1.4	1000	1000	958	979	96	98	70-130	2	20		
Potassium, Dissolved	ug/L	2180	10000	10000	12500	12800	103	106	70-130	2	20		
Silver, Dissolved	ug/L	<2.0	500	500	488	493	98	99	70-130	1	20		
Sodium, Dissolved	ug/L	5080	10000	10000	15300	15500	102	104	70-130	2	20		
Zinc, Dissolved	ug/L	<3.5	1000	1000	964	982	96	98	70-130	2	20		

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555676

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 60285463014

METHOD BLANK: 2279684

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<21.1	75.0	21.1	11/20/18 18:07	
Barium, Dissolved	ug/L	<1.5	5.0	1.5	11/20/18 18:07	
Beryllium, Dissolved	ug/L	0.50J	1.0	0.16	11/20/18 18:07	
Boron, Dissolved	ug/L	<12.5	100	12.5	11/20/18 18:07	
Calcium, Dissolved	ug/L	<53.5	200	53.5	11/20/18 18:07	
Cobalt, Dissolved	ug/L	<0.87	5.0	0.87	11/20/18 18:07	
Copper, Dissolved	ug/L	<4.5	15.0	4.5	11/20/18 18:07	
Iron, Dissolved	ug/L	<6.1	50.0	6.1	11/20/18 18:07	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	11/20/18 18:07	
Lithium, Dissolved	ug/L	<4.6	10.0	4.6	11/20/18 18:07	
Magnesium, Dissolved	ug/L	<14.0	50.0	14.0	11/20/18 18:07	
Manganese, Dissolved	ug/L	<0.73	5.0	0.73	11/20/18 18:07	
Molybdenum, Dissolved	ug/L	<0.90	20.0	0.90	11/20/18 18:07	
Nickel, Dissolved	ug/L	<1.4	5.0	1.4	11/20/18 18:07	
Potassium, Dissolved	ug/L	<79.3	500	79.3	11/20/18 18:07	
Silver, Dissolved	ug/L	<2.0	7.0	2.0	11/20/18 18:07	
Sodium, Dissolved	ug/L	<157	500	157	11/20/18 18:07	
Zinc, Dissolved	ug/L	<3.5	50.0	3.5	11/20/18 18:07	

LABORATORY CONTROL SAMPLE: 2279685

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	10000	10000	100	85-115	
Barium, Dissolved	ug/L	1000	986	99	85-115	
Beryllium, Dissolved	ug/L	1000	958	96	85-115	
Boron, Dissolved	ug/L	1000	963	96	85-115	
Calcium, Dissolved	ug/L	10000	9750	98	85-115	
Cobalt, Dissolved	ug/L	1000	998	100	85-115	
Copper, Dissolved	ug/L	1000	1010	101	85-115	
Iron, Dissolved	ug/L	10000	9530	95	85-115	
Lead, Dissolved	ug/L	1000	996	100	85-115	
Lithium, Dissolved	ug/L	1000	1000	100		
Magnesium, Dissolved	ug/L	10000	9880	99	85-115	
Manganese, Dissolved	ug/L	1000	998	100	85-115	
Molybdenum, Dissolved	ug/L	1000	1010	101	85-115	
Nickel, Dissolved	ug/L	1000	998	100	85-115	
Potassium, Dissolved	ug/L	10000	10200	102	85-115	
Silver, Dissolved	ug/L	500	506	101	85-115	
Sodium, Dissolved	ug/L	10000	10300	103	85-115	
Zinc, Dissolved	ug/L	1000	972	97	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285463014		2279686		2279687		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Aluminum, Dissolved	ug/L	28.2J	10000	10000	9950	9960	99	99	70-130	0	20			
Barium, Dissolved	ug/L	12.8	1000	1000	1000	1000	99	99	70-130	0	20			
Beryllium, Dissolved	ug/L	0.34J	1000	1000	972	978	97	98	70-130	1	20			
Boron, Dissolved	ug/L	3160	1000	1000	4110	4080	96	92	70-130	1	20			
Calcium, Dissolved	ug/L	9380	10000	10000	18800	18900	95	95	70-130	0	20			
Cobalt, Dissolved	ug/L	<0.87	1000	1000	988	989	99	99	70-130	0	20			
Copper, Dissolved	ug/L	<4.5	1000	1000	1010	992	100	99	70-130	1	20			
Iron, Dissolved	ug/L	26.9J	10000	10000	9650	9680	96	96	70-130	0	20			
Lead, Dissolved	ug/L	<3.0	1000	1000	952	955	95	95	70-130	0	20			
Lithium, Dissolved	ug/L	<4.6	1000	1000	1020	1020	102	102	70-130	0	20			
Magnesium, Dissolved	ug/L	<14.0	10000	10000	9710	9650	97	97	70-130	1	20			
Manganese, Dissolved	ug/L	2.9J	1000	1000	999	991	100	99	70-130	1	20			
Molybdenum, Dissolved	ug/L	193	1000	1000	1200	1210	100	101	70-130	1	20			
Nickel, Dissolved	ug/L	4.5J	1000	1000	993	994	99	99	70-130	0	20			
Potassium, Dissolved	ug/L	3310	10000	10000	13900	14000	106	107	70-130	0	20			
Silver, Dissolved	ug/L	<2.0	500	500	499	494	100	99	70-130	1	20			
Sodium, Dissolved	ug/L	244000	10000	10000	255000	255000	101	107	70-130	0	20			
Zinc, Dissolved	ug/L	<3.5	1000	1000	1000	1000	100	100	70-130	0	20			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 556085

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 60285463019, 60285463020

METHOD BLANK: 2281749

Matrix: Water

Associated Lab Samples: 60285463019, 60285463020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Aluminum, Dissolved	ug/L	<21.1	75.0	21.1	11/27/18 15:05	
Barium, Dissolved	ug/L	<1.5	5.0	1.5	11/27/18 15:05	
Beryllium, Dissolved	ug/L	<0.16	1.0	0.16	11/27/18 15:05	
Boron, Dissolved	ug/L	<12.5	100	12.5	11/27/18 15:05	
Calcium, Dissolved	ug/L	<53.5	200	53.5	11/27/18 15:05	
Cobalt, Dissolved	ug/L	<0.87	5.0	0.87	11/27/18 15:05	
Copper, Dissolved	ug/L	<4.5	15.0	4.5	11/27/18 15:05	
Iron, Dissolved	ug/L	<6.1	50.0	6.1	11/27/18 15:05	
Lead, Dissolved	ug/L	<3.0	10.0	3.0	11/27/18 15:05	
Lithium, Dissolved	ug/L	<4.6	10.0	4.6	11/27/18 15:05	
Magnesium, Dissolved	ug/L	<14.0	50.0	14.0	11/27/18 15:05	
Manganese, Dissolved	ug/L	<0.73	5.0	0.73	11/27/18 15:05	
Molybdenum, Dissolved	ug/L	<0.90	20.0	0.90	11/27/18 15:05	
Nickel, Dissolved	ug/L	<1.4	5.0	1.4	11/27/18 15:05	
Potassium, Dissolved	ug/L	<79.3	500	79.3	11/27/18 15:05	
Silver, Dissolved	ug/L	<2.0	7.0	2.0	11/27/18 15:05	
Sodium, Dissolved	ug/L	169J	500	157	11/27/18 15:05	
Zinc, Dissolved	ug/L	<3.5	50.0	3.5	11/27/18 15:05	

LABORATORY CONTROL SAMPLE: 2281750

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Aluminum, Dissolved	ug/L	10000	9950	100	85-115	
Barium, Dissolved	ug/L	1000	981	98	85-115	
Beryllium, Dissolved	ug/L	1000	993	99	85-115	
Boron, Dissolved	ug/L	1000	998	100	85-115	
Calcium, Dissolved	ug/L	10000	9940	99	85-115	
Cobalt, Dissolved	ug/L	1000	1030	103	85-115	
Copper, Dissolved	ug/L	1000	1020	102	85-115	
Iron, Dissolved	ug/L	10000	10000	100	85-115	
Lead, Dissolved	ug/L	1000	999	100	85-115	
Lithium, Dissolved	ug/L	1000	983	98	85-115	
Magnesium, Dissolved	ug/L	10000	10200	102	85-115	
Manganese, Dissolved	ug/L	1000	1010	101	85-115	
Molybdenum, Dissolved	ug/L	1000	1010	101	85-115	
Nickel, Dissolved	ug/L	1000	1020	102	85-115	
Potassium, Dissolved	ug/L	10000	10000	100	85-115	
Silver, Dissolved	ug/L	500	515	103	85-115	
Sodium, Dissolved	ug/L	10000	10500	105	85-115	
Zinc, Dissolved	ug/L	1000	1010	101	85-115	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285463020		2281940		2281941		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Aluminum, Dissolved	ug/L	<21.1	10000	10000	9840	9940	98	99	70-130	1	20			
Barium, Dissolved	ug/L	401	1000	1000	1380	1380	98	97	70-130	0	20			
Beryllium, Dissolved	ug/L	<0.16	1000	1000	1000	1000	100	100	70-130	0	20			
Boron, Dissolved	ug/L	54.0J	1000	1000	1060	1060	101	101	70-130	0	20			
Calcium, Dissolved	ug/L	108000	10000	10000	120000	118000	121	100	70-130	2	20			
Cobalt, Dissolved	ug/L	<0.87	1000	1000	992	994	99	99	70-130	0	20			
Copper, Dissolved	ug/L	<4.5	1000	1000	1030	1020	103	102	70-130	0	20			
Iron, Dissolved	ug/L	9270	10000	10000	19400	19100	101	98	70-130	1	20			
Lead, Dissolved	ug/L	3.2J	1000	1000	962	966	96	96	70-130	0	20			
Lithium, Dissolved	ug/L	5.9J	1000	1000	980	984	97	98	70-130	0	20			
Magnesium, Dissolved	ug/L	19800	10000	10000	29900	29600	101	98	70-130	1	20			
Manganese, Dissolved	ug/L	250	1000	1000	1240	1240	99	99	70-130	0	20			
Molybdenum, Dissolved	ug/L	<0.90	1000	1000	1000	1010	100	101	70-130	0	20			
Nickel, Dissolved	ug/L	<1.4	1000	1000	982	984	98	98	70-130	0	20			
Potassium, Dissolved	ug/L	1910	10000	10000	12100	11900	102	100	70-130	1	20			
Silver, Dissolved	ug/L	<2.0	500	500	509	510	102	102	70-130	0	20			
Sodium, Dissolved	ug/L	23300	10000	10000	33500	33300	102	100	70-130	0	20			
Zinc, Dissolved	ug/L	<3.5	1000	1000	987	984	99	98	70-130	0	20			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553503 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60285463001, 60285463002, 60285463003

METHOD BLANK: 2269773 Matrix: Water

Associated Lab Samples: 60285463001, 60285463002, 60285463003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/08/18 14:59	
Arsenic	ug/L	<0.065	1.0	0.065	11/08/18 14:59	
Cadmium	ug/L	<0.033	0.50	0.033	11/08/18 14:59	
Chromium	ug/L	<0.078	1.0	0.078	11/08/18 14:59	
Selenium	ug/L	<0.085	1.0	0.085	11/08/18 14:59	
Thallium	ug/L	<0.099	1.0	0.099	11/08/18 14:59	

LABORATORY CONTROL SAMPLE: 2269774

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.5	104	85-115	
Arsenic	ug/L	40	39.5	99	85-115	
Cadmium	ug/L	40	38.9	97	85-115	
Chromium	ug/L	40	38.1	95	85-115	
Selenium	ug/L	40	43.8	109	85-115	
Thallium	ug/L	40	38.0	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2269775 2269776

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual	
		60285463002 Result	Spike Conc.	Spike Conc.	MS Result						MSD Result
Antimony	ug/L	<0.078	80	80	81.1	82.9	101	104	70-130	2	20
Arsenic	ug/L	3.6	80	80	84.5	85.0	101	102	70-130	1	20
Cadmium	ug/L	<0.033	80	80	74.0	75.0	92	94	70-130	1	20
Chromium	ug/L	0.15J	80	80	77.0	77.3	96	96	70-130	0	20
Selenium	ug/L	<0.085	80	80	84.0	84.3	105	105	70-130	0	20
Thallium	ug/L	<0.099	80	80	70.3	72.3	88	90	70-130	3	20

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553993 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
 Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2271645 Matrix: Water
 Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/14/18 17:48	
Arsenic	ug/L	<0.065	1.0	0.065	11/14/18 17:48	
Cadmium	ug/L	<0.033	0.50	0.033	11/14/18 17:48	
Chromium	ug/L	0.12J	1.0	0.078	11/14/18 17:48	
Selenium	ug/L	<0.085	1.0	0.085	11/14/18 17:48	
Thallium	ug/L	<0.099	1.0	0.099	11/14/18 17:48	

LABORATORY CONTROL SAMPLE: 2271646

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	99	85-115	
Arsenic	ug/L	40	39.7	99	85-115	
Cadmium	ug/L	40	38.9	97	85-115	
Chromium	ug/L	40	39.6	99	85-115	
Selenium	ug/L	40	39.0	97	85-115	
Thallium	ug/L	40	37.6	94	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271647 2271648

Parameter	Units	60285588003		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	<0.078	40	40	39.4	38.5	99	96	70-130	2	20		
Arsenic	ug/L	0.56J	40	40	38.0	37.2	94	92	70-130	2	20		
Cadmium	ug/L	0.14J	40	40	37.0	36.3	92	91	70-130	2	20		
Chromium	ug/L	0.38J	40	40	39.2	38.5	97	95	70-130	2	20		
Selenium	ug/L	0.23J	40	40	34.4	34.1	85	85	70-130	1	20		
Thallium	ug/L	<0.099	40	40	38.4	37.6	96	94	70-130	2	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271649 2271650

Parameter	Units	60285588004		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony	ug/L	<0.078	40	40	36.9	37.5	92	94	70-130	2	20		
Arsenic	ug/L	9.7	40	40	44.3	45.0	86	88	70-130	2	20		
Cadmium	ug/L	0.036J	40	40	35.6	36.5	89	91	70-130	3	20		
Chromium	ug/L	0.16J	40	40	36.5	37.4	91	93	70-130	2	20		
Selenium	ug/L	0.087J	40	40	32.2	32.8	80	82	70-130	2	20		

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285588004		2271649		2271650		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result								
Thallium	ug/L	<0.099	40	40	36.5	36.7	91	92	70-130	1	20			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro
Pace Project No.: 60285463

QC Batch: 554272 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60285463014, 60285463019, 60285463020, 60285463021

METHOD BLANK: 2273296 Matrix: Water
Associated Lab Samples: 60285463014, 60285463019, 60285463020, 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.078	1.0	0.078	11/14/18 14:01	
Arsenic	ug/L	<0.065	1.0	0.065	11/14/18 14:01	
Cadmium	ug/L	<0.033	0.50	0.033	11/14/18 14:01	
Chromium	ug/L	0.085J	1.0	0.078	11/14/18 14:01	
Selenium	ug/L	<0.085	1.0	0.085	11/14/18 14:01	
Thallium	ug/L	<0.099	1.0	0.099	11/14/18 14:01	

LABORATORY CONTROL SAMPLE: 2273297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	98	85-115	
Arsenic	ug/L	40	39.8	99	85-115	
Cadmium	ug/L	40	39.1	98	85-115	
Chromium	ug/L	40	39.6	99	85-115	
Selenium	ug/L	40	39.8	99	85-115	
Thallium	ug/L	40	38.0	95	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2273298 2273299

Parameter	Units	60285742002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	% Rec	% Rec					
Antimony	ug/L	ND	40	40	42.0	40.6	103	99	70-130	3	20		
Arsenic	ug/L	1.1	40	40	42.8	42.2	104	103	70-130	1	20		
Cadmium	ug/L	ND	40	40	38.3	37.5	96	94	70-130	2	20		
Chromium	ug/L	2.4	40	40	42.5	42.2	100	100	70-130	1	20		
Selenium	ug/L	4.8	40	40	43.1	42.0	96	93	70-130	2	20		
Thallium	ug/L	ND	40	40	40.1	39.7	100	99	70-130	1	20		

MATRIX SPIKE SAMPLE: 2273300

Parameter	Units	60285463015 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	<0.078	40	40.1	100	70-130	
Arsenic	ug/L	1.3	40	42.0	102	70-130	
Cadmium	ug/L	0.23J	40	38.3	95	70-130	
Chromium	ug/L	0.20J	40	38.9	97	70-130	
Selenium	ug/L	0.24J	40	38.3	95	70-130	
Thallium	ug/L	<0.099	40	38.4	96	70-130	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch:	553967	Analysis Method:	EPA 200.8
QC Batch Method:	EPA 200.8	Analysis Description:	200.8 MET Dissolved
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007		

METHOD BLANK:	2271491	Matrix:	Water
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007		

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	<0.15	1.0	0.15	11/08/18 19:17	
Arsenic, Dissolved	ug/L	<0.15	1.0	0.15	11/08/18 19:17	
Cadmium, Dissolved	ug/L	<0.070	0.50	0.070	11/08/18 19:17	
Chromium, Dissolved	ug/L	<0.19	1.0	0.19	11/08/18 19:17	
Selenium, Dissolved	ug/L	<0.16	1.0	0.16	11/08/18 19:17	
Thallium, Dissolved	ug/L	<0.14	1.0	0.14	11/08/18 19:17	

LABORATORY CONTROL SAMPLE: 2271492

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	40	39.7	99	85-115	
Arsenic, Dissolved	ug/L	40	40.6	101	85-115	
Cadmium, Dissolved	ug/L	40	39.2	98	85-115	
Chromium, Dissolved	ug/L	40	40.5	101	85-115	
Selenium, Dissolved	ug/L	40	38.0	95	85-115	
Thallium, Dissolved	ug/L	40	38.8	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271493 2271494

Parameter	Units	60285081007		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony, Dissolved	ug/L	0.28J	40	40	40.2	39.6	100	98	70-130	2	20		
Arsenic, Dissolved	ug/L	2.3	40	40	42.7	42.6	101	101	70-130	0	20		
Cadmium, Dissolved	ug/L	0.073J	40	40	38.5	38.7	96	97	70-130	1	20		
Chromium, Dissolved	ug/L	0.28J	40	40	39.6	39.6	98	98	70-130	0	20		
Selenium, Dissolved	ug/L	1.1	40	40	37.5	37.2	91	90	70-130	1	20		
Thallium, Dissolved	ug/L	<0.14	40	40	37.1	36.9	93	92	70-130	1	20		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271495 2271496

Parameter	Units	60285463002		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Spike Conc.	Spike Conc.	Result	Result	% Rec	% Rec					
Antimony, Dissolved	ug/L	<0.15	40	40	39.7	40.0	99	100	70-130	1	20		
Arsenic, Dissolved	ug/L	3.5	40	40	44.9	44.9	103	104	70-130	0	20		
Cadmium, Dissolved	ug/L	<0.070	40	40	38.7	38.5	97	96	70-130	1	20		

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameter	Units	60285463002		2271495		2271496		% Rec	% Rec	% Rec	Limits	RPD	Max RPD	Qual
		Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec							
Chromium, Dissolved	ug/L	<0.19	40	40	43.1	42.8	107	107	70-130	1	20			
Selenium, Dissolved	ug/L	<0.16	40	40	37.1	37.3	93	93	70-130	0	20			
Thallium, Dissolved	ug/L	<0.14	40	40	36.9	37.1	92	93	70-130	1	20			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555332 Analysis Method: EPA 200.8
 QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET Dissolved
 Associated Lab Samples: 60285463019, 60285463020

METHOD BLANK: 2278037 Matrix: Water

Associated Lab Samples: 60285463019, 60285463020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony, Dissolved	ug/L	<0.15	1.0	0.15	11/16/18 15:08	
Arsenic, Dissolved	ug/L	<0.15	1.0	0.15	11/16/18 15:08	
Cadmium, Dissolved	ug/L	<0.070	0.50	0.070	11/16/18 15:08	
Chromium, Dissolved	ug/L	<0.19	1.0	0.19	11/16/18 15:08	
Selenium, Dissolved	ug/L	<0.16	1.0	0.16	11/16/18 15:08	
Thallium, Dissolved	ug/L	<0.14	1.0	0.14	11/16/18 15:08	

LABORATORY CONTROL SAMPLE: 2278038

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony, Dissolved	ug/L	40	40.5	101	85-115	
Arsenic, Dissolved	ug/L	40	39.7	99	85-115	
Cadmium, Dissolved	ug/L	40	39.3	98	85-115	
Chromium, Dissolved	ug/L	40	40.6	102	85-115	
Selenium, Dissolved	ug/L	40	39.5	99	85-115	
Thallium, Dissolved	ug/L	40	38.4	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2278039 2278040

Parameter	Units	MS		MSD		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		60285463018 Result	Spike Conc.	Spike Conc.	Result						
Antimony, Dissolved	ug/L	<0.15	40	40	39.8	40.1	99	100	70-130	1	20
Arsenic, Dissolved	ug/L	0.50J	40	40	39.3	39.5	97	98	70-130	1	20
Cadmium, Dissolved	ug/L	0.31J	40	40	36.8	37.1	91	92	70-130	1	20
Chromium, Dissolved	ug/L	<0.19	40	40	37.7	37.8	94	94	70-130	0	20
Selenium, Dissolved	ug/L	0.28J	40	40	36.6	36.5	91	90	70-130	0	20
Thallium, Dissolved	ug/L	<0.14	40	40	35.2	35.5	88	89	70-130	1	20

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554304

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60285463001, 60285463002, 60285463003

METHOD BLANK: 2273460

Matrix: Water

Associated Lab Samples: 60285463001, 60285463002, 60285463003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<4.9	20.0	4.9	11/09/18 11:47	

LABORATORY CONTROL SAMPLE: 2273461

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	513	103	90-110	

SAMPLE DUPLICATE: 2273463

Parameter	Units	60285458009 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	186	188	1	10	

SAMPLE DUPLICATE: 2273464

Parameter	Units	60285463002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	385	399	4	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554631

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2275134

Matrix: Water

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/12/18 11:39	

LABORATORY CONTROL SAMPLE: 2275135

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

SAMPLE DUPLICATE: 2275136

Parameter	Units	60285588003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	278	284	2	10	

SAMPLE DUPLICATE: 2275137

Parameter	Units	60285588004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	166	176	6	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555056

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60285463014

METHOD BLANK: 2277012

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<4.9	20.0	4.9	11/14/18 12:23	

LABORATORY CONTROL SAMPLE: 2277013

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	508	102	90-110	

SAMPLE DUPLICATE: 2277014

Parameter	Units	60285459017 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	88.4	84.0	5	10	

SAMPLE DUPLICATE: 2277015

Parameter	Units	60285786001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	1150	1140	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555057

Analysis Method: SM 2320B

QC Batch Method: SM 2320B

Analysis Description: 2320B Alkalinity

Associated Lab Samples: 60285463019, 60285463020, 60285463021

METHOD BLANK: 2277016

Matrix: Water

Associated Lab Samples: 60285463019, 60285463020, 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	<4.9	20.0	4.9	11/15/18 14:10	

LABORATORY CONTROL SAMPLE: 2277017

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	500	486	97	90-110	

SAMPLE DUPLICATE: 2277018

Parameter	Units	60285463019 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	263	264	0	10	

SAMPLE DUPLICATE: 2277019

Parameter	Units	60285981001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO ₃	mg/L	2020	2010	1	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553343

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60285463001

METHOD BLANK: 2269295

Matrix: Water

Associated Lab Samples: 60285463001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/06/18 07:46	

LABORATORY CONTROL SAMPLE: 2269296

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

SAMPLE DUPLICATE: 2269297

Parameter	Units	60285426001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	680	729	7	10	

SAMPLE DUPLICATE: 2269298

Parameter	Units	60285434007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	368000	796000			D6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553994 Analysis Method: SM 2540C
 QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
 Associated Lab Samples: 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2271651 Matrix: Water
 Associated Lab Samples: 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/08/18 08:03	

LABORATORY CONTROL SAMPLE: 2271652

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	977	98	80-120	

SAMPLE DUPLICATE: 2271653

Parameter	Units	60285463002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	411	434	5	10	

SAMPLE DUPLICATE: 2271654

Parameter	Units	60285588004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	382	391	2	10	

SAMPLE DUPLICATE: 2272215

Parameter	Units	60285588003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	633	623	2	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554334

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60285463014

METHOD BLANK: 2273547

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/07/18 10:13	

LABORATORY CONTROL SAMPLE: 2273548

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1120	112	80-120	

SAMPLE DUPLICATE: 2273549

Parameter	Units	60285435001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1400	1000	33	10	D6

SAMPLE DUPLICATE: 2273550

Parameter	Units	60286055003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	14300	12500	13	10	D6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554724

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60285463019, 60285463020

METHOD BLANK: 2275599

Matrix: Water

Associated Lab Samples: 60285463019, 60285463020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/12/18 13:58	

LABORATORY CONTROL SAMPLE: 2275600

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

SAMPLE DUPLICATE: 2275601

Parameter	Units	60285463016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	550	551	0	10	

SAMPLE DUPLICATE: 2275602

Parameter	Units	60285911006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	204	197	3	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554725

Analysis Method: SM 2540C

QC Batch Method: SM 2540C

Analysis Description: 2540C Total Dissolved Solids

Associated Lab Samples: 60285463021

METHOD BLANK: 2275612

Matrix: Water

Associated Lab Samples: 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/12/18 14:11	

LABORATORY CONTROL SAMPLE: 2275613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	968	97	80-120	

SAMPLE DUPLICATE: 2275614

Parameter	Units	60285463021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	<5.0	<5.0		10	

SAMPLE DUPLICATE: 2275615

Parameter	Units	60286083004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1100	1100	0	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553472 Analysis Method: SM 3500-Fe B#4
 QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
 Associated Lab Samples: 60285463001, 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2269693 Matrix: Water
 Associated Lab Samples: 60285463001, 60285463002, 60285463003, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/05/18 16:23	H6

LABORATORY CONTROL SAMPLE: 2269694

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	101	90-110	H6

SAMPLE DUPLICATE: 2269695

Parameter	Units	60285463002 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.61	0.62	2	20	H6

SAMPLE DUPLICATE: 2269696

Parameter	Units	60285588003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.84	0.85	1	20	H6

SAMPLE DUPLICATE: 2269697

Parameter	Units	60285588004 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.074J	0.072J		20	H6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553781

Analysis Method: SM 3500-Fe B#4

QC Batch Method: SM 3500-Fe B#4

Analysis Description: Iron, Ferrous

Associated Lab Samples: 60285463014

METHOD BLANK: 2270734

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/06/18 15:48	H6

LABORATORY CONTROL SAMPLE: 2270735

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.1	104	90-110	H6

SAMPLE DUPLICATE: 2270736

Parameter	Units	60285459011 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	2.1	2.1	1	20	H6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553945 Analysis Method: SM 3500-Fe B#4

QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous

Associated Lab Samples: 60285463019, 60285463020

METHOD BLANK: 2271402 Matrix: Water

Associated Lab Samples: 60285463019, 60285463020

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/07/18 12:57	H6

LABORATORY CONTROL SAMPLE: 2271403

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.1	104	90-110	H6

SAMPLE DUPLICATE: 2271405

Parameter	Units	60285459027 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554530

Analysis Method: SM 3500-Fe B#4

QC Batch Method: SM 3500-Fe B#4

Analysis Description: Iron, Ferrous

Associated Lab Samples: 60285463021

METHOD BLANK: 2274461

Matrix: Water

Associated Lab Samples: 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/10/18 12:07	H6

LABORATORY CONTROL SAMPLE: 2274462

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.0	100	90-110	H6

SAMPLE DUPLICATE: 2274464

Parameter	Units	60285787001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	1.8	1.7	4	20	H6

SAMPLE DUPLICATE: 2274465

Parameter	Units	60285787003 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	0.32	0.28	13	20	H6

SAMPLE DUPLICATE: 2274466

Parameter	Units	60286214001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	13.5	13.6	1	20	H6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554525 Analysis Method: EPA 300.0
 QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
 Associated Lab Samples: 60285463001, 60285463002, 60285463003

METHOD BLANK: 2274427 Matrix: Water

Associated Lab Samples: 60285463001, 60285463002, 60285463003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/15/18 10:10	
Fluoride	mg/L	<0.19	0.20	0.19	11/15/18 10:10	
Sulfate	mg/L	<0.24	1.0	0.24	11/15/18 10:10	

LABORATORY CONTROL SAMPLE: 2274428

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	2.5	100	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE SAMPLE: 2274431

Parameter	Units	60285463002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	7.4	5	12.4	100	90-110	
Fluoride	mg/L	<0.19	2.5	2.7	101	90-110	
Sulfate	mg/L	14.3	5	19.4	102	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555497

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2278823

Matrix: Water

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.34J	1.0	0.29	11/17/18 00:09	
Fluoride	mg/L	<0.19	0.20	0.19	11/17/18 00:09	
Sulfate	mg/L	<0.24	1.0	0.24	11/17/18 00:09	

LABORATORY CONTROL SAMPLE: 2278824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 555838 Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60285463019, 60285463020, 60285463021

METHOD BLANK: 2281077 Matrix: Water

Associated Lab Samples: 60285463019, 60285463020, 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/19/18 14:20	
Fluoride	mg/L	<0.19	0.20	0.19	11/19/18 14:20	
Sulfate	mg/L	<0.24	1.0	0.24	11/19/18 14:20	

LABORATORY CONTROL SAMPLE: 2281078

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	103	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2281079 2281080

Parameter	Units	60285865001		MS		MSD		MS		MSD		% Rec Limits	RPD	Max RPD	Qual
		Result	Conc.	Spike Conc.	Conc.	Result	Result	% Rec	% Rec						
Chloride	mg/L	84.1	100	100	100	190	189	106	105	90-110	1	15			
Fluoride	mg/L	ND	50	50	50	54.4	53.4	109	107	90-110	2	15			
Sulfate	mg/L	237	100	100	100	345	344	108	107	90-110	0	15			

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 556128

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60285463014

METHOD BLANK: 2281830

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	11/20/18 08:33	
Fluoride	mg/L	<0.19	0.20	0.19	11/20/18 08:33	

LABORATORY CONTROL SAMPLE: 2281831

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	2.3	91	90-110	

MATRIX SPIKE SAMPLE: 2281834

Parameter	Units	60286055003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	511	500	1060	110	90-110	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 558973

Analysis Method: EPA 300.0

QC Batch Method: EPA 300.0

Analysis Description: 300.0 IC Anions

Associated Lab Samples: 60285463014

METHOD BLANK: 2293697

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	12/08/18 01:22	

LABORATORY CONTROL SAMPLE: 2293698

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2293699 2293700

Parameter	Units	60286737028		2293700		MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
		MS Result	MSD Spike Conc.	MS Result	MSD Spike Conc.						
Sulfate	mg/L	149	100	249	100	100	98	90-110	1	15	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553805 Analysis Method: EPA 365.4
 QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
 Associated Lab Samples: 60285463001, 60285463002, 60285463003

METHOD BLANK: 2270850 Matrix: Water

Associated Lab Samples: 60285463001, 60285463002, 60285463003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/08/18 11:51	

LABORATORY CONTROL SAMPLE: 2270851

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	96	90-110	

MATRIX SPIKE SAMPLE: 2270852

Parameter	Units	60285717001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	<0.050	2	1.8	89	90-110	M1

MATRIX SPIKE SAMPLE: 2270854

Parameter	Units	60285463002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.41	2	2.2	88	90-110	M1

SAMPLE DUPLICATE: 2270853

Parameter	Units	60285414003 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	1.1	0.97	14	10	D6

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553806

Analysis Method: EPA 365.4

QC Batch Method: EPA 365.4

Analysis Description: 365.4 Phosphorus

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

METHOD BLANK: 2270855

Matrix: Water

Associated Lab Samples: 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/08/18 12:25	

LABORATORY CONTROL SAMPLE: 2270856

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	2.0	98	90-110	

MATRIX SPIKE SAMPLE: 2270857

Parameter	Units	60285617009 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.60	2	2.4	92	90-110	

MATRIX SPIKE SAMPLE: 2270859

Parameter	Units	60285588004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.35	2	2.1	87	90-110	M1

SAMPLE DUPLICATE: 2270858

Parameter	Units	60285588003 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	3.5	3.5	1	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 553830

Analysis Method: EPA 365.4

QC Batch Method: EPA 365.4

Analysis Description: 365.4 Phosphorus

Associated Lab Samples: 60285463014

METHOD BLANK: 2270902

Matrix: Water

Associated Lab Samples: 60285463014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/08/18 13:01	

LABORATORY CONTROL SAMPLE: 2270903

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	93	90-110	

MATRIX SPIKE SAMPLE: 2270904

Parameter	Units	60285715002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2.2	2	4.0	90	90-110	

MATRIX SPIKE SAMPLE: 2270906

Parameter	Units	60285459021 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.67	2	2.3	83	90-110	M1

SAMPLE DUPLICATE: 2270905

Parameter	Units	60285459014 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	<0.050	<0.050		10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554598	Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4	Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60285463019	

METHOD BLANK: 2275084 Matrix: Water
Associated Lab Samples: 60285463019

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/13/18 08:31	

LABORATORY CONTROL SAMPLE: 2275085

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	93	90-110	

MATRIX SPIKE SAMPLE: 2275086

Parameter	Units	60286073001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	<0.050	2	1.7	86	90-110	M1

MATRIX SPIKE SAMPLE: 2275088

Parameter	Units	60285887002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.12	2	2.0	93	90-110	

SAMPLE DUPLICATE: 2275087

Parameter	Units	60285845001 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	6.9	6.9	0	10	

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QUALITY CONTROL DATA

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 554599

Analysis Method: EPA 365.4

QC Batch Method: EPA 365.4

Analysis Description: 365.4 Phosphorus

Associated Lab Samples: 60285463020, 60285463021

METHOD BLANK: 2275090

Matrix: Water

Associated Lab Samples: 60285463020, 60285463021

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/13/18 09:10	

LABORATORY CONTROL SAMPLE: 2275091

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	2.0	101	90-110	

MATRIX SPIKE SAMPLE: 2275092

Parameter	Units	60285463021 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	<0.050	2	1.7	87	90-110	M1

MATRIX SPIKE SAMPLE: 2275094

Parameter	Units	60285979001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	9.6	2	11.3	85	90-110	M1

SAMPLE DUPLICATE: 2275093

Parameter	Units	60285975004 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	6.2	6.3	2	10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-4 **Lab ID: 60285463001** Collected: 11/01/18 13:45 Received: 11/02/18 02:38 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.289 ± 0.269 (0.355) C:NA T:93%	pCi/L	11/27/18 10:29	13982-63-3	
Radium-228	EPA 904.0	0.511 ± 0.416 (0.825) C:71% T:83%	pCi/L	11/26/18 17:13	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-5 **Lab ID: 60285463002** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.414 ± 0.328 (0.427) C:NA T:92%	pCi/L	11/27/18 10:29	13982-63-3	
Radium-228	EPA 904.0	0.952 ± 0.447 (0.739) C:72% T:88%	pCi/L	11/26/18 17:13	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-1 **Lab ID: 60285463003** Collected: 11/01/18 13:35 Received: 11/02/18 02:38 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.214 ± 0.326 (0.561) C:NA T:97%	pCi/L	11/27/18 10:29	13982-63-3	
Radium-228	EPA 904.0	0.703 ± 0.454 (0.840) C:65% T:79%	pCi/L	11/26/18 17:13	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-5 MS		Lab ID: 60285463004	Collected: 11/01/18 13:35	Received: 11/02/18 02:38	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC)	Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	83.49 %REC ± NA (NA)		pCi/L	11/27/18 11:30	13982-63-3	
		C:NA T:NA					
Radium-228	EPA 904.0	81.13 %REC ± NA (NA)		pCi/L	11/26/18 17:12	15262-20-1	
		C:NA T:NA					

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	80.84 %REC 3.23 RPD ± NA (NA) C:NA T:NA	pCi/L	11/27/18 11:30	13982-63-3	
Radium-228	EPA 904.0	113.17 %REC 32.98 RPD ± NA (NA) C:NA T:NA	pCi/L	11/26/18 17:13	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-1 **Lab ID: 60285589001** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.446 ± 0.380 (0.534) C:NA T:90%	pCi/L	11/27/18 11:04	13982-63-3	
Radium-228	EPA 904.0	0.365 ± 0.476 (1.01) C:63% T:85%	pCi/L	11/26/18 17:12	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-3 **Lab ID: 60285589002** Collected: 11/02/18 14:10 Received: 11/03/18 02:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.206 ± 0.379 (0.676) C:NA T:89%	pCi/L	11/27/18 11:04	13982-63-3	
Radium-228	EPA 904.0	0.873 ± 0.509 (0.930) C:67% T:81%	pCi/L	11/26/18 17:12	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-7		Lab ID: 60285589003	Collected: 11/02/18 11:35	Received: 11/03/18 02:40	Matrix: Water		
PWS:		Site ID:	Sample Type:				
Parameters	Method	Act ± Unc (MDC) Carr Trac		Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.644 ± 0.334 (0.116)		pCi/L	11/27/18 11:17	13982-63-3	
		C:NA T:97%					
Radium-228	EPA 904.0	0.782 ± 0.573 (1.12)		pCi/L	11/26/18 17:30	15262-20-1	
		C:63% T:78%					

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B1 **Lab ID: 60285589004** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.785 ± 0.462 (0.555) C:NA T:90%	pCi/L	11/27/18 11:17	13982-63-3	
Radium-228	EPA 904.0	0.739 ± 0.556 (1.10) C:64% T:85%	pCi/L	11/26/18 17:12	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-DUP-2 **Lab ID: 60285589007** Collected: 11/02/18 10:25 Received: 11/03/18 02:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.355 ± 0.250 (0.120) C:NA T:97%	pCi/L	11/27/18 11:17	13982-63-3	
Radium-228	EPA 904.0	0.522 ± 0.543 (1.13) C:66% T:78%	pCi/L	11/26/18 17:12	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-1 **Lab ID: 60285589008** Collected: 11/02/18 11:33 Received: 11/03/18 02:40 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.180 ± 0.251 (0.418) C:NA T:89%	pCi/L	11/27/18 11:17	13982-63-3	
Radium-228	EPA 904.0	1.50 ± 0.651 (1.07) C:69% T:77%	pCi/L	11/26/18 17:49	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-2 **Lab ID: 60285463014** Collected: 11/05/18 11:55 Received: 11/06/18 04:09 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.340 ± 0.446 (0.743) C:NA T:78%	pCi/L	11/27/18 10:29	13982-63-3	
Radium-228	EPA 904.0	0.852 ± 0.705 (1.44) C:64% T:82%	pCi/L	11/26/18 17:10	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-6 **Lab ID: 60285463019** Collected: 11/06/18 09:10 Received: 11/07/18 03:58 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.389 ± 0.330 (0.410) C:NA T:92%	pCi/L	11/29/18 21:58	13982-63-3	
Radium-228	EPA 904.0	0.0116 ± 0.252 (0.590) C:71% T:97%	pCi/L	11/26/18 15:44	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-MW-B2 **Lab ID: 60285463020** Collected: 11/06/18 10:50 Received: 11/07/18 03:58 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.538 ± 0.400 (0.526) C:NA T:99%	pCi/L	11/29/18 21:58	13982-63-3	
Radium-228	EPA 904.0	0.161 ± 0.358 (0.795) C:73% T:80%	pCi/L	11/28/18 11:30	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Sample: R-FB-2 **Lab ID: 60285463021** Collected: 11/06/18 09:00 Received: 11/07/18 03:58 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	0.378 ± 0.385 (0.582) C:NA T:92%	pCi/L	11/29/18 21:58	13982-63-3	
Radium-228	EPA 904.0	0.450 ± 0.382 (0.759) C:72% T:76%	pCi/L	11/28/18 11:30	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch:	320180	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463004, 60285463005, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008		

METHOD BLANK:	1562008	Matrix:	Water
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463004, 60285463005, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.302 ± 0.343 (0.542) C:NA T:84%	pCi/L	11/27/18 10:29	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch:	320185	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463004, 60285463005, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008		

METHOD BLANK:	1562013	Matrix:	Water
Associated Lab Samples:	60285463001, 60285463002, 60285463003, 60285463004, 60285463005, 60285463014, 60285589001, 60285589002, 60285589003, 60285589004, 60285589007, 60285589008		

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.773 ± 0.434 (0.752) C:68% T:77%	pCi/L	11/26/18 17:13	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 321135 Analysis Method: EPA 903.1
 QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
 Associated Lab Samples: 60285463019, 60285463020, 60285463021

METHOD BLANK: 1566280 Matrix: Water
 Associated Lab Samples: 60285463019, 60285463020, 60285463021

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0526 ± 0.240 (0.488) C:NA T:90%	pCi/L	11/29/18 21:58	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 321146

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60285463020, 60285463021

METHOD BLANK: 1566295

Matrix: Water

Associated Lab Samples: 60285463020, 60285463021

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.139 ± 0.301 (0.738) C:76% T:81%	pCi/L	11/28/18 11:29	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

QC Batch: 321145

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 60285463019

METHOD BLANK: 1566294

Matrix: Water

Associated Lab Samples: 60285463019

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.289 ± 0.326 (0.684) C:78% T:86%	pCi/L	11/26/18 15:42	

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QUALIFIERS

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

DEFINITIONS

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

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

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

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

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

S - Surrogate

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

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

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

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

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

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

1e FERROUS IRON result is greater than the IRON Data is within laboratory control limits.

2e FERROUS IRON result is greater than the IRON. Data is within laboratory control limits.

B Analyte was detected in the associated method blank.

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

D9 Dissolved result is greater than the total. Data is within laboratory control limits.

H1 Analysis conducted outside the EPA method holding time.

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 RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60285463001	R-MW-4	EPA 200.7	553504	EPA 200.7	553586
60285463002	R-MW-5	EPA 200.7	553504	EPA 200.7	553586
60285463003	R-DUP-1	EPA 200.7	553504	EPA 200.7	553586
60285589001	R-MW-1	EPA 200.7	553881	EPA 200.7	553980
60285589002	R-MW-3	EPA 200.7	553881	EPA 200.7	553980
60285589003	R-MW-7	EPA 200.7	553881	EPA 200.7	553980
60285589004	R-MW-B1	EPA 200.7	553881	EPA 200.7	553980
60285589007	R-DUP-2	EPA 200.7	553881	EPA 200.7	553980
60285589008	R-FB-1	EPA 200.7	553881	EPA 200.7	553980
60285463014	R-MW-2	EPA 200.7	554059	EPA 200.7	554138
60285463019	R-MW-6	EPA 200.7	554168	EPA 200.7	554260
60285463020	R-MW-B2	EPA 200.7	554168	EPA 200.7	554260
60285463021	R-FB-2	EPA 200.7	554168	EPA 200.7	554260
60285463001	R-MW-4	EPA 200.7	555618	EPA 200.7	555634
60285463002	R-MW-5	EPA 200.7	555618	EPA 200.7	555634
60285463003	R-DUP-1	EPA 200.7	555618	EPA 200.7	555634
60285589001	R-MW-1	EPA 200.7	555618	EPA 200.7	555634
60285589002	R-MW-3	EPA 200.7	555618	EPA 200.7	555634
60285589003	R-MW-7	EPA 200.7	555618	EPA 200.7	555634
60285589004	R-MW-B1	EPA 200.7	555618	EPA 200.7	555634
60285589007	R-DUP-2	EPA 200.7	555618	EPA 200.7	555634
60285463014	R-MW-2	EPA 200.7	555676	EPA 200.7	555704
60285463019	R-MW-6	EPA 200.7	556085	EPA 200.7	556210
60285463020	R-MW-B2	EPA 200.7	556085	EPA 200.7	556210
60285463001	R-MW-4	EPA 200.8	553503	EPA 200.8	553585
60285463002	R-MW-5	EPA 200.8	553503	EPA 200.8	553585
60285463003	R-DUP-1	EPA 200.8	553503	EPA 200.8	553585
60285589001	R-MW-1	EPA 200.8	553993	EPA 200.8	554038
60285589002	R-MW-3	EPA 200.8	553993	EPA 200.8	554038
60285589003	R-MW-7	EPA 200.8	553993	EPA 200.8	554038
60285589004	R-MW-B1	EPA 200.8	553993	EPA 200.8	554038
60285589007	R-DUP-2	EPA 200.8	553993	EPA 200.8	554038
60285589008	R-FB-1	EPA 200.8	553993	EPA 200.8	554038
60285463014	R-MW-2	EPA 200.8	554272	EPA 200.8	554344
60285463019	R-MW-6	EPA 200.8	554272	EPA 200.8	554344
60285463020	R-MW-B2	EPA 200.8	554272	EPA 200.8	554344
60285463021	R-FB-2	EPA 200.8	554272	EPA 200.8	554344
60285463001	R-MW-4	EPA 200.8	553967	EPA 200.8	554042
60285463002	R-MW-5	EPA 200.8	553967	EPA 200.8	554042
60285463003	R-DUP-1	EPA 200.8	553967	EPA 200.8	554042
60285589001	R-MW-1	EPA 200.8	553967	EPA 200.8	554042
60285589002	R-MW-3	EPA 200.8	553967	EPA 200.8	554042
60285589003	R-MW-7	EPA 200.8	553967	EPA 200.8	554042
60285589004	R-MW-B1	EPA 200.8	553967	EPA 200.8	554042

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60285589007	R-DUP-2	EPA 200.8	553967	EPA 200.8	554042
60285463014	R-MW-2	EPA 200.8	553967	EPA 200.8	554042
60285463019	R-MW-6	EPA 200.8	555332	EPA 200.8	555404
60285463020	R-MW-B2	EPA 200.8	555332	EPA 200.8	555404
60285463001	R-MW-4	EPA 903.1	320180		
60285463002	R-MW-5	EPA 903.1	320180		
60285463003	R-DUP-1	EPA 903.1	320180		
60285463004	R-MW-5 MS	EPA 903.1	320180		
60285463005	R-MW-5 MSD	EPA 903.1	320180		
60285589001	R-MW-1	EPA 903.1	320180		
60285589002	R-MW-3	EPA 903.1	320180		
60285589003	R-MW-7	EPA 903.1	320180		
60285589004	R-MW-B1	EPA 903.1	320180		
60285589007	R-DUP-2	EPA 903.1	320180		
60285589008	R-FB-1	EPA 903.1	320180		
60285463014	R-MW-2	EPA 903.1	320180		
60285463019	R-MW-6	EPA 903.1	321135		
60285463020	R-MW-B2	EPA 903.1	321135		
60285463021	R-FB-2	EPA 903.1	321135		
60285463001	R-MW-4	EPA 904.0	320185		
60285463002	R-MW-5	EPA 904.0	320185		
60285463003	R-DUP-1	EPA 904.0	320185		
60285463004	R-MW-5 MS	EPA 904.0	320185		
60285463005	R-MW-5 MSD	EPA 904.0	320185		
60285589001	R-MW-1	EPA 904.0	320185		
60285589002	R-MW-3	EPA 904.0	320185		
60285589003	R-MW-7	EPA 904.0	320185		
60285589004	R-MW-B1	EPA 904.0	320185		
60285589007	R-DUP-2	EPA 904.0	320185		
60285589008	R-FB-1	EPA 904.0	320185		
60285463014	R-MW-2	EPA 904.0	320185		
60285463019	R-MW-6	EPA 904.0	321145		
60285463020	R-MW-B2	EPA 904.0	321146		
60285463021	R-FB-2	EPA 904.0	321146		
60285463001	R-MW-4	SM 2320B	554304		
60285463002	R-MW-5	SM 2320B	554304		
60285463003	R-DUP-1	SM 2320B	554304		
60285589001	R-MW-1	SM 2320B	554631		
60285589002	R-MW-3	SM 2320B	554631		
60285589003	R-MW-7	SM 2320B	554631		
60285589004	R-MW-B1	SM 2320B	554631		
60285589007	R-DUP-2	SM 2320B	554631		
60285589008	R-FB-1	SM 2320B	554631		
60285463014	R-MW-2	SM 2320B	555056		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60285463019	R-MW-6	SM 2320B	555057		
60285463020	R-MW-B2	SM 2320B	555057		
60285463021	R-FB-2	SM 2320B	555057		
60285463001	R-MW-4	SM 2540C	553343		
60285463002	R-MW-5	SM 2540C	553994		
60285463003	R-DUP-1	SM 2540C	553994		
60285589001	R-MW-1	SM 2540C	553994		
60285589002	R-MW-3	SM 2540C	553994		
60285589003	R-MW-7	SM 2540C	553994		
60285589004	R-MW-B1	SM 2540C	553994		
60285589007	R-DUP-2	SM 2540C	553994		
60285589008	R-FB-1	SM 2540C	553994		
60285463014	R-MW-2	SM 2540C	554334		
60285463019	R-MW-6	SM 2540C	554724		
60285463020	R-MW-B2	SM 2540C	554724		
60285463021	R-FB-2	SM 2540C	554725		
60285463001	R-MW-4	SM 3500-Fe B#4	554999		
60285463002	R-MW-5	SM 3500-Fe B#4	554999		
60285463003	R-DUP-1	SM 3500-Fe B#4	554999		
60285589001	R-MW-1	SM 3500-Fe B#4	554999		
60285589002	R-MW-3	SM 3500-Fe B#4	554999		
60285589003	R-MW-7	SM 3500-Fe B#4	554999		
60285589004	R-MW-B1	SM 3500-Fe B#4	554999		
60285589007	R-DUP-2	SM 3500-Fe B#4	556178		
60285589008	R-FB-1	SM 3500-Fe B#4	556178		
60285463014	R-MW-2	SM 3500-Fe B#4	556178		
60285463019	R-MW-6	SM 3500-Fe B#4	558082		
60285463020	R-MW-B2	SM 3500-Fe B#4	558082		
60285463021	R-FB-2	SM 3500-Fe B#4	558082		
60285463001	R-MW-4	SM 3500-Fe B#4	553472		
60285463002	R-MW-5	SM 3500-Fe B#4	553472		
60285463003	R-DUP-1	SM 3500-Fe B#4	553472		
60285589001	R-MW-1	SM 3500-Fe B#4	553472		
60285589002	R-MW-3	SM 3500-Fe B#4	553472		
60285589003	R-MW-7	SM 3500-Fe B#4	553472		
60285589004	R-MW-B1	SM 3500-Fe B#4	553472		
60285589007	R-DUP-2	SM 3500-Fe B#4	553472		
60285589008	R-FB-1	SM 3500-Fe B#4	553472		
60285463014	R-MW-2	SM 3500-Fe B#4	553781		
60285463019	R-MW-6	SM 3500-Fe B#4	553945		
60285463020	R-MW-B2	SM 3500-Fe B#4	553945		
60285463021	R-FB-2	SM 3500-Fe B#4	554530		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN RIEC RCPA / GeoHydro

Pace Project No.: 60285463

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60285463001	R-MW-4	EPA 300.0	554525		
60285463002	R-MW-5	EPA 300.0	554525		
60285463003	R-DUP-1	EPA 300.0	554525		
60285589001	R-MW-1	EPA 300.0	555497		
60285589002	R-MW-3	EPA 300.0	555497		
60285589003	R-MW-7	EPA 300.0	555497		
60285589004	R-MW-B1	EPA 300.0	555497		
60285589007	R-DUP-2	EPA 300.0	555497		
60285589008	R-FB-1	EPA 300.0	555497		
60285463014	R-MW-2	EPA 300.0	556128		
60285463014	R-MW-2	EPA 300.0	558973		
60285463019	R-MW-6	EPA 300.0	555838		
60285463020	R-MW-B2	EPA 300.0	555838		
60285463021	R-FB-2	EPA 300.0	555838		
60285463001	R-MW-4	EPA 365.4	553805		
60285463002	R-MW-5	EPA 365.4	553805		
60285463003	R-DUP-1	EPA 365.4	553805		
60285589001	R-MW-1	EPA 365.4	553806		
60285589002	R-MW-3	EPA 365.4	553806		
60285589003	R-MW-7	EPA 365.4	553806		
60285589004	R-MW-B1	EPA 365.4	553806		
60285589007	R-DUP-2	EPA 365.4	553806		
60285589008	R-FB-1	EPA 365.4	553806		
60285463014	R-MW-2	EPA 365.4	553830		
60285463019	R-MW-6	EPA 365.4	554598		
60285463020	R-MW-B2	EPA 365.4	554599		
60285463021	R-FB-2	EPA 365.4	554599		

REPORT OF LABORATORY ANALYSIS

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Sample Condition Upon Receipt

WO#: 60285463



60285463

Client Name: Golder Assoc

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 zpic

Thermometer Used: T-298 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 1.7, 1.1 Corr. Factor 0.0 Corrected 1.7, 1.1

Date and initials of person examining contents: 11/2/18 [Signature]

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>UT</u>	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: [Signature] Date: 11/2/18

Project Manager Review: _____ Date: _____



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: **1** of **2**

Section A
 Required Client Information:
 Company: **Golder Associates**
 Address: **13515 Barrett Parkway Drive, Ste 260**
 Ballwin, MO 63021
 Email To: **imaddock@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, Eric Schmidt, Golder**
 Purchase Order No.:
 Project Name: **Ameren Rush Island Engery Center-RCRA**
 Project Number: **453-1406.000ZE (COC #8)**

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 CODE DRINKING WATER DW WATER WT WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL CL WP AR OT TS	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP) (see valid codes to left)	MATRIX CODE	# OF CONTAINERS	PRESERVATIVES		Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
		DATE	TIME				DATE	TIME			
1	R-MW-1			G	WT						
2	R-MW-2			G	WT						
3	R-MW-3			G	WT						
4	R-MW-4	11/1/18	1345	G	WT	7	H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other				
5	R-MW-5	11/1/18	1335	G	WT	7	H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other				
6	R-MW-6			G	WT						
7	R-MW-7			G	WT						
8	R-MW-B1			G	WT						
9	R-MW-B2			G	WT						
10	R-P-70			G	WT						
11	R-P-71			G	WT						
12	R-B-70			G	WT						

ADDITIONAL COMMENTS
 Eric Schmidt/Golder 11/1/18 1835 EBrooketa/Pace 11/2/18 0259 1.7
 1.1
 Temp in C
 Received on Ice (Y/N)
 Custody Sealed Cooler (Y/N)
 Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: **Eric Schneider**
 SIGNATURE of SAMPLER: *[Signature]*
 DATE Signed (MM/DD/YYYY): **11/01/18**



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: **Golden Associates**
Address: **13515 Barrett Parkway Drive, Ste 260**
Ballwin, MO 63021

Section B
Required Project Information:
Request To: **Mark Haddock** (mhaddock@golder.com)
Copy To: **Jeffrey Ingram**, **Eric-Schneidder Golder**
Purchase Order No.:
Project Name: **Ameren Rush Island Energy Center-RCPA**
Phone: **636-724-9191** Fax: **636-724-6323**
Requested Due Date/TAT: **Standard**

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

REGULATORY AGENCY
NPDES: **GROUND WATER**
UST: **RURR**
DRINKING WATER
OTHER

Page: **2** of **2**

ITEM #	Valid Matrix Codes ANALYSIS DRINKING WATER WASTE WATER WASTE WATER PRODUCT SOIL/SOLID OIL SL VLP AR AS TS	Section D Requires Client Information SAMPLE ID (4-Z, 0-3 / -) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAV C=COMP)	COLLECTED		# OF CONTAINERS	PRESERVATIVES	Requested Analysis Filtered (Y/N)	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples In tact (Y/N)
					COMPOSITE START	COMPOSITE END/GRAB							
1		R-P100	WT	G									
2		R-P101	WT	G									
3		R-P102	WT	G									
4		R-DUP-1	WT	G	11/11/18		7 2 1 4						
5		R-DUP-2	WT	G									
6		R-FB1	WT	G									
7		R-FB2	WT	G									
8		R-MW-5 - MS	WT	G	11/11/18 1335		7 2 1 4						
9		R-MW-5 - MSD	WT	G	11/11/18 1335		7 2 1 4						
10			WT	G									
11			WT	G									
12			WT	G									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	<i>Eric Schneidder</i>	11/11/18	1835	<i>E Brackett</i>	11/18	0239	1.7
							1.1

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: **Eric Schneidder**
SIGNATURE of SAMPLER: *Eric Schneidder*

DATE Signed (MM/DD/YYYY): **11/01/18**



Sample Condition Upon Receipt

WO# : 60285589
60285589

Client Name: Goldo

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: 301 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 3.6 4.0 Corr. Factor 1.20 Corrected 3.6 4.0

Date and initials of person examining contents: 2/11/18

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>IC²</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 ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jamie Chish Date: 11/4/18

CHAIN-OF-CUSTODY / Analytical Request Document

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



Page: 1 of 2

Section A
Required Client Information:

Company: **Golder Associates**
 Address: 13515 Barrett Parkway Drive, Ste 260
 Ballwin, MO 63021
 Email To: maddock@golder.com
 Phone: 636-724-9191 Fax: 636-724-8323
 Requested Due Date/TAT: Standard

Section B
Required Project Information:

Report To: **Mark Haddock (mhaddock@golder.com)**
 Copy To: **Jeffrey Ingram, Eric Schneider**
 Purchase Order No.:
 Project Name: **Ameren Rush Island Engery Center-RCPA**
 Project Number: **153-1406.0002E (COC #8)**

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 RCRA UST OTHER
 DRINKING WATER

ITEM #	Section D Required Client Information	Valid Matrix Codes	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED		SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives		Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
					COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME							
1	R-MW-1		WT	G			11/2/18 1025	7	2	1	1	1	1	1		001	
2	R-MW-2		WT	G				7	2	1	1	1	1	1		002	
3	R-MW-3		WT	G			11/2/18 1410	7	2	1	1	1	1	1		003	
4	R-MW-4		WT	G				7	2	1	1	1	1	1		004	
5	R-MW-5		WT	G				7	2	1	1	1	1	1		005	
6	R-MW-6		WT	G				7	2	1	1	1	1	1		006	
7	R-MW-7		WT	G			11/2/18 1135	7	2	1	1	1	1	1		007	
8	R-MW-B1		WT	G			11/2/18 1025	7	2	1	1	1	1	1		008	
9	R-MW-B2		WT	G				7	2	1	1	1	1	1		009	
10	R-P17S W		WT	G			11/2/18 1420	7	2	1	1	1	1	1		010	
11	R-P17I		WT	G			11/2/18 1300	7	2	1	1	1	1	1		011	
12	R-P17D		WT	G				7	2	1	1	1	1	1		012	

Requested Analysis Filtered (Y/N)

ACCEPTED BY / AFFILIATION

DATE TIME

DATE TIME

DATE SIGNED (MM/DD/YY)

PRINT NAME of SAMPLER: **Eric Schneider**

SIGNATURE of SAMPLER: *Eric Schneider*

SAMPLER NAME AND SIGNATURE

Temp In °C

Received on

Cooler (Y/N)

SAMPLE CONDITIONS

*EPA 200.7: B, Ca, Ba, Li, Mg
 *EPA 200.8: Sb, As, Se

*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.



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: 13515 Barrett Parkway Drive, Ste 260 Ballwin, MO 63021 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, Jeff.Ingram@Golder.com Purchase Order No.: Project Name: Amrenen Rush Island Engery Center-RCFA Project Number: 153-1406-0002E (COC #6)		Section C Invoice Information: Attention: Company Name: Address: Price Quote Reference: Price Project Manager: Jamie Church Price Profile #: 9285	
REGULATORY AGENCY NPDES <input type="checkbox"/> GROUND WATER <input checked="" type="checkbox"/> DRINKING WATER UST <input type="checkbox"/> RCRA <input type="checkbox"/> OTHER <input type="checkbox"/>		Site Location STATE: MO		Requested Analysis Filtered (Y/N)	

Page: **2** of **2**

ITEM #	Valid Matrix Codes MATRIX CODE EMERGENCY WATER WATER WASTE WATER PRODUCT SOIL/SOLID OIL	SAMPLE TYPE (G=GRAV 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			
1	R-P19S	WT G								
2	R-P19I	WT G								
3	R-P19D	WT G								
4	R-DUP-1	WT G								
5	R-DUP-2	WT G	11/2/18		7	2	14			
6	R-FB-1	WT G	11/2/18	1133	6	2	13			
7	R-FB-2	WT G								
8		WT G								
9		WT G								
10		WT G								
11		WT G								
12		WT G								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.7-B, C3, Pb, Li, Mn EPA 200.3-Sb, Ni, Se	<i>John M. ...</i>	11/2/18	1735	<i>[Signature]</i>	11/18	0240	Y Y Y Y Y
							Y Y Y Y
							Y Y Y Y

SAMPLER NAME AND SIGNATURE PRINT Name of SAMPLER: <i>Eric Seigrist</i> SIGNATURE of SAMPLER: <i>[Signature]</i>		DATE SIGNED (MM/DD/YYYY): 11/02/18
--	--	------------------------------------



CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: **2** of **2**

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Golder Associates		Report To: Mark Haddock (mhaddock@golder.com)		Attention:	
Address: 13515 Barrett Parkway Drive, Site 260		Copy To: Jeffrey Ingram		Company Name:	
Baltimore, MO 63021		Purchase Order No.:		Address:	
Email To: mhaddock@golder.com		Project Name: Antieron Rush Island EC Geochem/Hydrogeo		State: MO	
Phone: 636-724-9191		Project Number: 153-1406.0002G (COC #9)		Site Location:	
Requested Due Date/TAT: Standard		Face Profile #: 9285		Requested Analysis Filtered (Y/N):	

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER WASTE WATER PRODUCT SOLID/SOLID OIL	SAMPLE TYPE (G=GRAV C=COMP)	COLLECTED		# OF CONTAINERS	Requested Analysis Filtered (Y/N)										Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB		Y	N	Y	N	Y	N	Y	N	Y	N	
1	R-P19S	WT G				Metals*	Metals, Dissolved**	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	CCR AppIV Metals***+Fig	Residual Chlorine (Y/N)	
2	R-P19I	WT G				Unpreserved	H ₂ SO ₄	HCl	NaOH	Na ₂ O ₂	Methanol	Other				
3	R-P19D	WT G														
4	R-DUP-1	WT G	11/21/18		7											
5	R-DUP-2	WT G	11/21/18		4											
6	R-FB-1	WT G	11/21/18	11:33	6											
7	R-FB-2	WT G														
8		WT S														
9		WT G														
10		WT G														
11		WT G														
12		WT G														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.7: Fe, Mg, Mn, K, Na, Al, Cu, Ni, Ag, Zn	<i>Goldner / Golder Associates</i>	11/21/18	17:35				Received on Ice (Y/N)
**EPA 200.7: Ba, Be, B, Ca, Co, Pb, Li, Mo, Fe, Mg, Mn, K, Na, Al, Cu, Ni, Ag, Zn							Sealed Cooler (Y/N)
**EPA 200.8: Sb, As, Cd, Cr, Se, Tl							Custody (Y/N)
**EPA 200.7: Be, Co, Pb							Samples Intact (Y/N)
**EPA 200.8: Cd, Cr, Tl							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: **Eric Schneider**

SIGNATURE of SAMPLER: *Eric Schneider*

DATE Signed (MM/DD/YYYY): **11/02/18**



Sample Condition Upon Receipt

WO#: 60285463



Count 3

Client Name: Cooler Assoc.

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 [] Other [X] Tplc

Thermometer Used: T300 Type of Ice: (Wet) Blue None

Cooler Temperature (°C): As-read 0.6 Corr. Factor +0.2 Corrected 0.8

Date and initials of person examining contents: 11.6.18 JLS

Temperature should be above freezing to 6°C 0.3, 0.5, 0.3 0.5, 0.7, 0.5

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: WT	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers requiring pH preservation in compliance? (HNO ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Chish Date: 11/6/18



Sample Condition Upon Receipt

WO#: 60285463



60285463

Client Name: Cooler Assoc.

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 2pic

Thermometer Used: TJ00 Type of Ice: Wet Blue None

Cooler Temperature (°C): As-read 0.7 Corr. Factor +0.2 Corrected 0.9

Date and initials of person examining contents: 11-7-18 JS

Temperature should be above freezing to 6°C 0.8 +0.2 1.0

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>Fe²⁺</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 ₃ , H ₂ SO ₄ , HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Potassium iodide test strip turns blue/purple? (Preserve)	<input type="checkbox"/> Yes <input type="checkbox"/> No	
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Samples from USDA Regulated Area: State:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jamie Church Date: 11/7/18

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 2

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company: Goldier Associates	Report To: Mark Haddock (mhaddock@golder.com)	Attention:	Company Name:	REGULATORY AGENCY	
Address: 13515 Barrett Parkway Drive, Ste 260	Copy To: Jeffrey Ingram		Address:	<input type="checkbox"/> NPDES	<input type="checkbox"/> GROUND WATER
Ballwin, MO 63021			Pace Quote Reference:	<input checked="" type="checkbox"/> UST	<input type="checkbox"/> RCRA
Email To: maddock@golder.com	Purchase Order No.:		Pace Project Manager:	<input type="checkbox"/> OTHER	
Phone: 636-724-9191 Fax: 636-724-9323	Project Name: Ameren Rush Island Engery Center-RCPA		Jamie Church	Site Location	MO
Requested Due Date/TAT: Standard	Project Number: 153-1406.0002E (COC #8)		Pace Profile #: 9285	STATE:	

ITEM #	Section D Required Client Information	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WT 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)	DATE	TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Analysis Test Metals* Chloride/Fluoride/Sulfate Radium 226 Radium 228	Requested Analysis Filtered (Y/N)	Pace Project No./ Lab I.D.	
			COMPOSITE START	COMPOSITE END/GRAB											
1	R-MW-1				G	WT	11/6/18	0910		7	2	1	4		
2	R-MW-2				G	WT									
3	R-MW-3				G	WT									
4	R-MW-4				G	WT									
5	R-MW-5				G	WT									
6	R-MW-6				G	WT	11/6/18	1050		7	2	1	4		
7	R-MW-7				G	WT									
8	R-MW-B1				G	WT									
9	R-MW-B2				G	WT	11/6/18	1050		7	2	1	4		
10	R-P17S				G	WT									
11	R-P17I				G	WT									
12	R-P17D				G	WT									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
EPA 200.7: B, Ca, Ba, Li, Mo EPA 200.8: Sb, As, Se	Goldier Associates	11/6/18	1550	Mark Haddock	11/6/18	1550	Y
	Jeffrey Ingram	11/6/18	1700	Jeffrey Ingram	11-7-18	0358	Y
							1-0

*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



CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Mark Haddock (mhaddock@golder.com)	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260 Ballwin, MO 63021	Copy To:	Jeffrey Ingram	Company Name:	
Email To:	mhaddock@golder.com	Purchase Order No.:		Address:	
Phone:	636-724-9191	Project Name:	Ameren Rush Island EC Geochem/Hydrogeo	Pace Quote Reference:	
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0002G (COC #9)	Pace Project Manager:	Jamie Church
				Pace Profile #:	9285

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
 UST RCRA OTHER

Site Location: MO
 STATE: MO

ITEM #	Valid Matrix Codes MATRIX CODE DRINKING WATER DW WASTE WATER WW PRODUCT P SOIL/SOLID SL OIL OL WP WP AR AR OT OT TS TS	SAMPLER TYPE (G=GRAB C=COMP)	COLLECTED		# OF CONTAINERS	Preservatives Unpreserved H ₂ SO ₄ HNO ₃ HCl NaOH Na ₂ S ₂ O ₃ Methanol Other	Analysis Test Metals* Metals, Dissolved** Chloride/Fluoride/Sulfate TDS Alkalinity Total Phosphorus Ferrus Iron Feric Iron CCR Appl/V Metals***+Hg	Requested Analysis Filtered (Y/N)	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
			COMPOSITE START	COMPOSITE END/GRAB						
1	R-P19S	WT G	11/6/18	11/6/18	6					
2	R-P19I	WT G								
3	R-P19D	WT G								
4	R-DUP-1	WT G								
5	R-DUP-2	WT G								
6	R-FB-1	WT G								
7	R-FB-2	WT G								
8		WT G								
9		WT G								
10		WT G								
11		WT G								
12		WT G								

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	RECEIVED ON	Temp In °C	Ice (Y/N)	Cooler (Y/N)	Samples Intact
<i>[Signature]</i>	11/6/18	1550	<i>[Signature]</i>	11/6/18	1850	0.9		Y	Y	Y
<i>[Signature]</i>	11/6/18	1700	<i>[Signature]</i>	11/7/18	0358	1.0		Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: *[Signature]*
 SIGNATURE of SAMPLER: *[Signature]*

DATE Signed (MM/DD/YY): 11/06/18

MEMORANDUM**DATE** January 3, 2019**Project No.** 1531406**TO** Project File
Golder Associates**CC****FROM** Tommy Goodwin**EMAIL** tgoodwin@golder.com**DATA VALIDATION SUMMARY: AMEREN – RUSH ISLAND ENERGY CENTER – NOVEMBER 2018 - DATA PACKAGE 60285463**

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

- When analytes exceeded the recovery criteria for MS/MSD of a sample, the sample result was not qualified on MS/MSD data alone.
- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- 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 compound was detected in a blank (i.e. method, field, rinsate), and the sample results were greater than the PQL and less than ten times the blank results the results were recorded at the result value and qualified as estimates (J).
- When a field duplicate RPD was not met, associated samples were qualified as estimates (J). If the results were less than the MDL (MDC for radionuclide analysis) or detected in a blank below the PQL the results were qualified as non-detects and estimates (UJ).

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
 Project Name: Ameren-Rush Island - Nov 2018
 Reviewer: T Goodwin

Project Manager: J Ingram
 Project Number: 1531406.0002A
 Validation Date: 1/3/19

Laboratory: Pace Analytical SDG #: 60285463
 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 Aik 2320B, Fe^{2+/3+} SM3500, P 365.1
 Sample Names R-MW-1, R-MW-2, R-MW-3, R-MW-4, R-MW-5, R-MW-6, R-MW-7, R-MW-B1, R-MW-B2
R-DUP-1, R-FB-1, R-MW-5 MS, R-MW-5 MSD, R-DUP-2, R-FB-2

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>11/1, 11/2, 11/5, 11/6</u>
b) Sampling team indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Sample location noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
d) Sample depth indicated (Soils)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
e) Sample type indicated (grab/composite)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>Grab</u>
f) Field QC noted?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Field parameters collected (note types)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<u>pH, Cond, Turb, Temp, DO, ORP, Flow, DTW</u>
h) Field Calibration within control limits?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
i) Notations of unacceptable field conditions/performance from field logs or field notes?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
j) Does the laboratory narrative indicate deficiencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Note Deficiencies: _____				

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
b) Were hold times met for sample analysis?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>Fe²⁺</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 type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
g) Were any matrix problems noted?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="font-size: small; margin-bottom: 5px;"> $Cr(0.085)$, $Cl(0.34)$, $Ra-226(0.773)$ $Al(20.2)$, $Be(0.27)$, $Fe(6.8)$, $K(212)$, $Fe,d(10.3)$, $Na,d(216)$, $Be,d(252)$ $FB-1: B(26.1)$, $Fe,t(7.4)$, $Cr(0.14)$, $Fe^{3+}(0.0074)$, $Cl(0.3)$ $R-228(1.5)$ $FB-2: Be(0.20)$, $Na(318)$, $Sb(0.092)$, $As(0.26)$, $Cd(0.040)$, $Cr(0.5)$ $Sc(0.13)$ </div>
b) Were analytes detected in the field blank(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were analytes detected in the equipment blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
d) Were analytes detected in the trip blank(s)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div style="font-size: small; margin-bottom: 5px;"> <u>Dup-1 @ R-MW-4</u> <u>DUP-2 @ R-MW-1</u> <u>FB-1 @ R-MW-7</u> <u>FB-2 @ R-MW-6</u> DUP-1: $Al,d(200)$; $Be,t(200)$; $Co,t(40)$; $Cd,t(100)$; $Sc,d(200)$; $Pb-210(31)$ TDS(126) DUP-2: $Cr,t(200)$; $Fe,d(57)$; $Mn,t(182)$; $Cr,t(100)$; $Ra-226(23)$; $Fe^{3+}(200)$ <u>TDS(?) (13)</u>, <u>P(14)</u> </div>
b) Were field dup. precision criteria met (note RPD)?	<input 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"/>	
d) Were lab dup. precision criteria met (note RPD)?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<u>All 200.7, t; P</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>All 200.7, t; Cr,d</u>
Recovery could not be calculated since sample contained high concentration of analyte?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
c) Were MS/MSD precision criteria met?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
R-MW-4	Aluminum, total (Al, t)	34.5	J	Detected in Method Blank ; PQL < Result < 10x Blank
	Al, dissolved (Al, d)	39.0	J	
	Chromium, total (Cr, t)	1.0	U	; MDL < Result < PQL
	Cr, d	1.0	U	
	Cobalt, total (Co, t)	0.96	J	RPD exceeded limit ; Result > MDL
	Co, d	0.87	UJ	; Result < MDL
	Cadmium, total (Cd, t)	0.033	UJ	
	Cd, d	0.083	J	; Result > MDL
	Selenium, dissolved (Se, d)	0.21	J	
	TDS	99	J	
R-DUP-1	Al, t	41.2	J	MB ; PQL < Result < 10x Blank
	Co, t	0.87	UJ	RPD exceeded limit ; Result < MDL
	Cd, d	0.070	UJ	
	Se, d	0.16	UJ	
	TDS	439	J	; Result > MDL
R-MW-1	Iron, total (Fe, t)	50.0	U	MB ; MDL < Result < PQL
	Fe, d	50.0	U	
	Cr, t	1.0	U	
R-DUP-1	Cr, t	1.0	U	
R-DUP-2	Fe, t	50.0	U	
	Fe, d	50.0	U	
	Cr, t	1.0	U	
	Cr, d	1.0	U	
	Co, t	0.87	UJ	RPD exceeded limit ; Result < MDL
	Manganese, total (Mn, t)	51.2	J	; Result > MDL
R-MW-1	Ferric, Iron (Fe ³⁺)	0.0	UJ	; Result < MDL
R-DUP-2	Ferrous, Iron (Fe ²⁺)	0.012	UJ	

Signature: *Tommy Wood*

Date: 1/3/19

Continue on Next Page (4 of 5)

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
R-MW-5	Al, t	138	J	MB ; PQL < Result < 10x B
⊥	Al, d	93.6	J	⊥
R-MW-3	Beryllium, t (Be, t)	1.0	U	; MDL < Result < PQL
⊥	Potassium, t (K, t)	1630	J	; PQL < Result < 10x B
⊥	Be, d	1.0	U	; MDL < Result < PQL
⊥	K, d	1790	J	; PQL < Result < 10x B
⊥	Al, t	65.4	J	⊥
⊥	Cr, t	1.0	U	; MDL < Result < PQL
⊥	Cr, d	1.0	U	⊥
R-MW-7	Be, t	1.2	J	; PQL < Result < 10x B
⊥	Al, t	62.9	J	⊥
⊥	Cr, t	1.0	U	; MDL < Result < PQL
R-MW-B1	Al, t	64.3	J	; PQL < Result < 10x B
⊥	Al, d	113	J	⊥
⊥	Cr, t	1.0	U	; MDL < Result < PQL
⊥	Cr, d	1.0	U	⊥
R-FB-1	Fe, t	50.0	U	⊥
⊥	Cr, t	1.0	U	⊥
⊥	Chloride (Cl ⁻)	1.0	U	⊥
R-MW-2	Fe, t	62.8	J	; PQL < Result < 10x B
⊥	Fe, d	50.0	U	; MDL < Result < PQL
⊥	Be, d	1.0	U	⊥
⊥	Cr, t	1.0	U	⊥
⊥	Cr, d	1.0	U	⊥
⊥	Sulfate (SO ₄ ²⁻)	318	J	Run outside EPA hold time
R-MW-6	Cr, t	1.0	U	MB ; MDL < Result < PQL
⊥	Antimony, t (Sb, t)	1.0	U	Field Blank ;
⊥	Arsenic, t (As, t)	1.0	U	⊥
⊥	Cd, t	0.50	U	⊥
⊥	Se, t	1.0	U	⊥
⊥	As, d	1.0	U	⊥
⊥	Se, d	1.0	U	⊥

Signature: Tommy J. Wood

Date: 1/3/19

Continue on Next Page (5 of 5)

APPENDIX B

**Assessment Monitoring Statistical
Evaluation**

TECHNICAL MEMORANDUM**DATE** October 11, 2018**Project No.** 153-1406**TO** Bill Kutosky
Ameren Missouri**CC** Susan Knowles, Craig Giesmann, Paul Pike, Charlie Henderson**FROM** Mark Haddock - Golder Associates**EMAIL** mhaddock@golder.com**ASSESSMENT MONITORING STATISTICAL EVALUATION FOR THE RCPA SURFACE IMPOUNDMENT,
RUSH ISLAND ENERGY CENTER, JEFFERSON COUNTY MISSOURI**

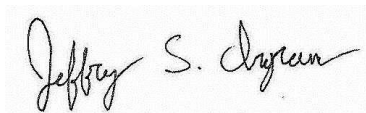
This Technical Memorandum provides the results of the Assessment Monitoring Statistical Evaluation for the RCPA Surface Impoundment at the Rush Island Energy Center located in Jefferson County Missouri. Included in this memorandum is a brief summary of constituents that are present at a Statistically Significant Level (SSL), an updated list of site-specific Groundwater Protection Standards (**Table 1**), and the Sanitas Technologies™ (Sanitas) statistical software output for each of the Appendix IV parameters (**Appendix A**).

SSLs were calculated using the methods and procedures outlined in the Groundwater Monitoring Plan's (GMP) Statistical Analysis Plan (SAP). No outliers were removed prior to calculation of the confidence intervals. A summary of SSLs at corresponding well(s) is as follows:

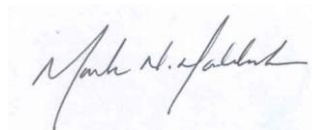
- Arsenic at MW-2, MW-3, and MW-7
- Molybdenum at MW-2, MW-3, and MW-7

Golder appreciates this opportunity to provide hydrogeological and engineering support services to Ameren. If you have any questions or comments regarding the information provided, please call our office at (314) 984-8800.

Sincerely,



Jeffrey Ingram, R.G.
Project Geologist



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

JSI/SCP/MNH

Enclosures:

Table 1 – RCPA Groundwater Protection Standards

Appendix A – Sanitas Confidence Interval Statistical Output

**RCPA Groundwater Protection Standards
RCPA Surface Impoundment
Rush Island Energy Center, Jefferson County, MO**

Parameter	Units	MCL or Health Based GWPS	Site GWPS	Value to Return to Detection Monitoring ⁷
Antimony	µg/L	6	6	DQR
Arsenic	µg/L	10	30	30
Barium	µg/L	2000	2000	593.3
Beryllium	µg/L	4	4	DQR
Cadmium	µg/L	5	5	DQR
Chromium	µg/L	100	100	5.422
Cobalt	µg/L	6	6	DQR
Fluoride	mg/l	4	4	0.236
Lead	µg/L	15	15	DQR
Lithium	µg/L	40	64.7	64.7
Mercury	µg/L	2	2	DQR
Molybdenum	µg/L	100	100	DQR
Radium 226 + 228	pCi/L	5	5	3.068
Selenium	µg/L	50	50	DQR
Thallium	µg/L	2	2	DQR

Notes:

1. µg/L - micrograms per liter
2. mg/L - milligrams per liter
3. pCi/L - picocuries per liter

4. MCL - Maximum Contaminant Level. MCLs from United States Environmental Protection Agency (USEPA) 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012.
<http://water.epa.gov/drink/contaminants/index.cfm>.

5. Health Based Groundwater Protection Standards (GWPS) were adopted for Appendix IV parameters without an MCL (i.e. cobalt, lithium, molybdenum, and lead). Information available at <https://www.epa.gov/coalash/coal-ash-rule>.

6. Values were calculated using statistical methods outlined for Detection Monitoring and are used for returning to Detection Monitoring based on available data to date.

7. DQR - Double Quantification Rule. If all baseline data are less than the Practical Quantitation Limit (PQL), then the DQR will be used. More information on the DQR is provided in the Statistical Analysis Plan.

8. Site GWPS is either the MCL/Health Based GWPS or based on background levels (calculated as described in the Statistical Analysis Plan for Assessment Monitoring), whichever is higher.

9. GWPS and background values calculated using baseline sampling results from monitoring wells MW-B1 and MW-B2.

Prepared by: JSI 10/3/2018

Checked by: TJG 10/4/2018

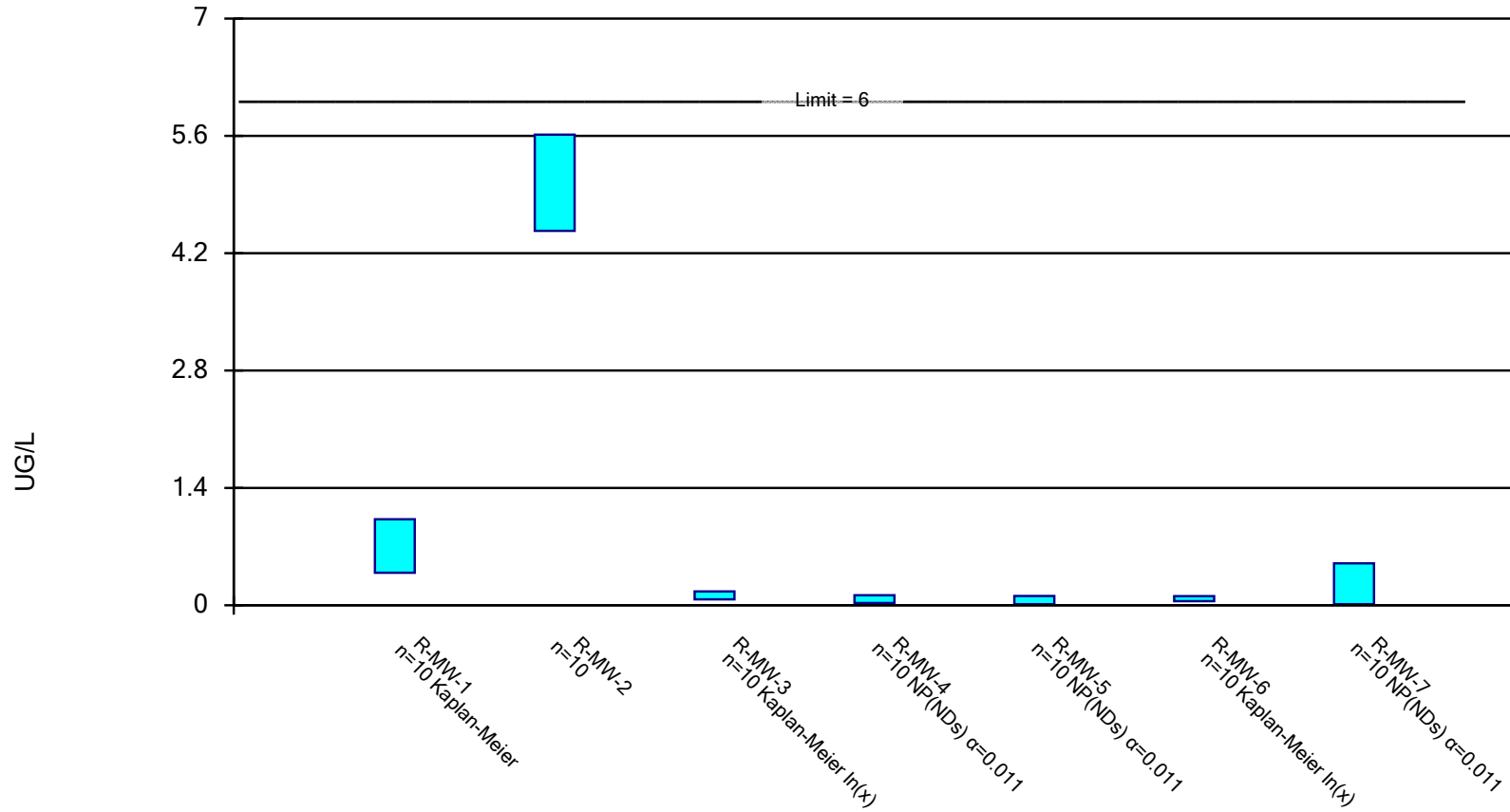
Reviewed by: MNH 10/10/2018

APPENDIX A

**Sanitas Confidence Interval
Statistical Output**

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

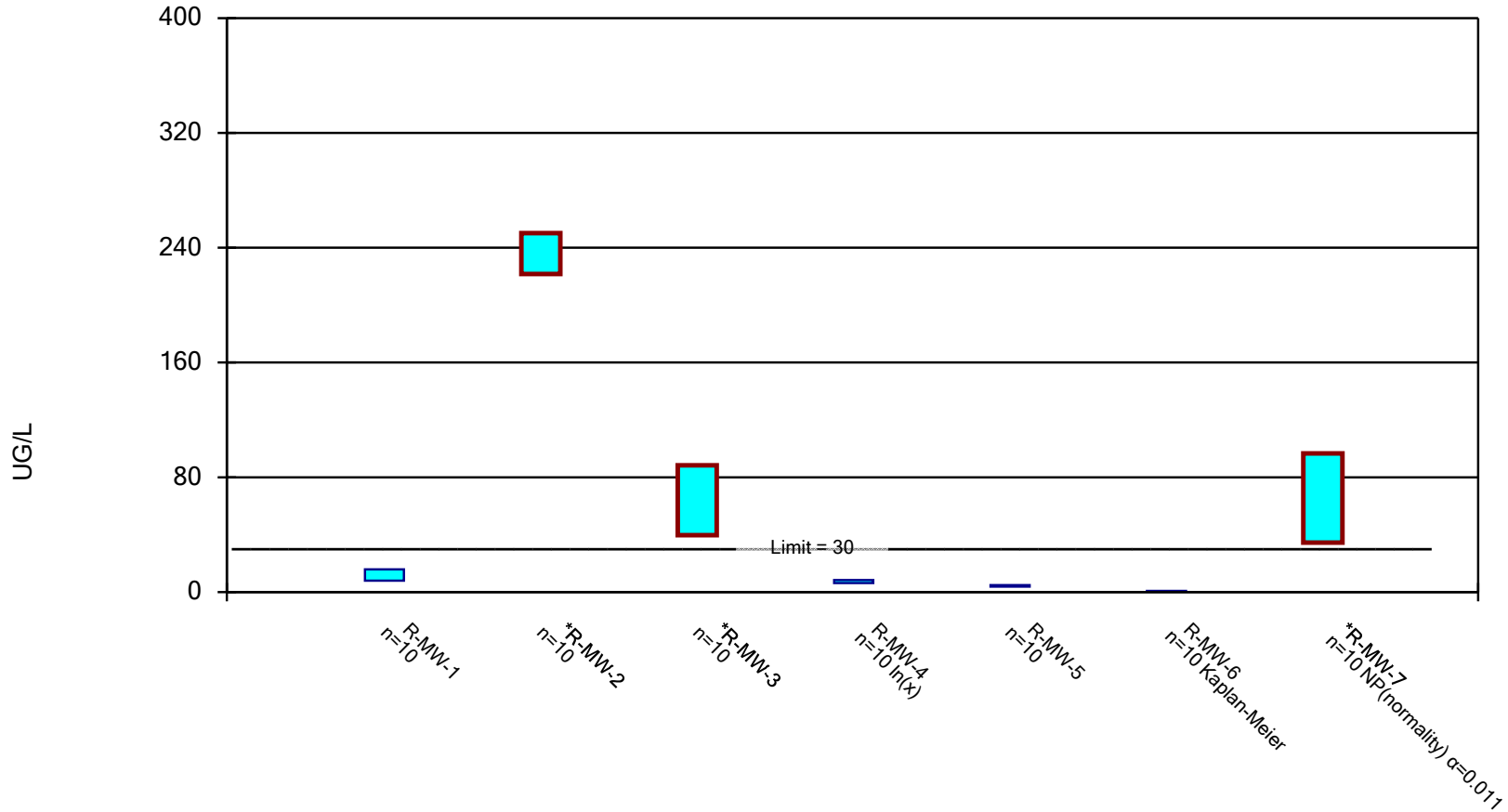


Constituent: ANTIMONY, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

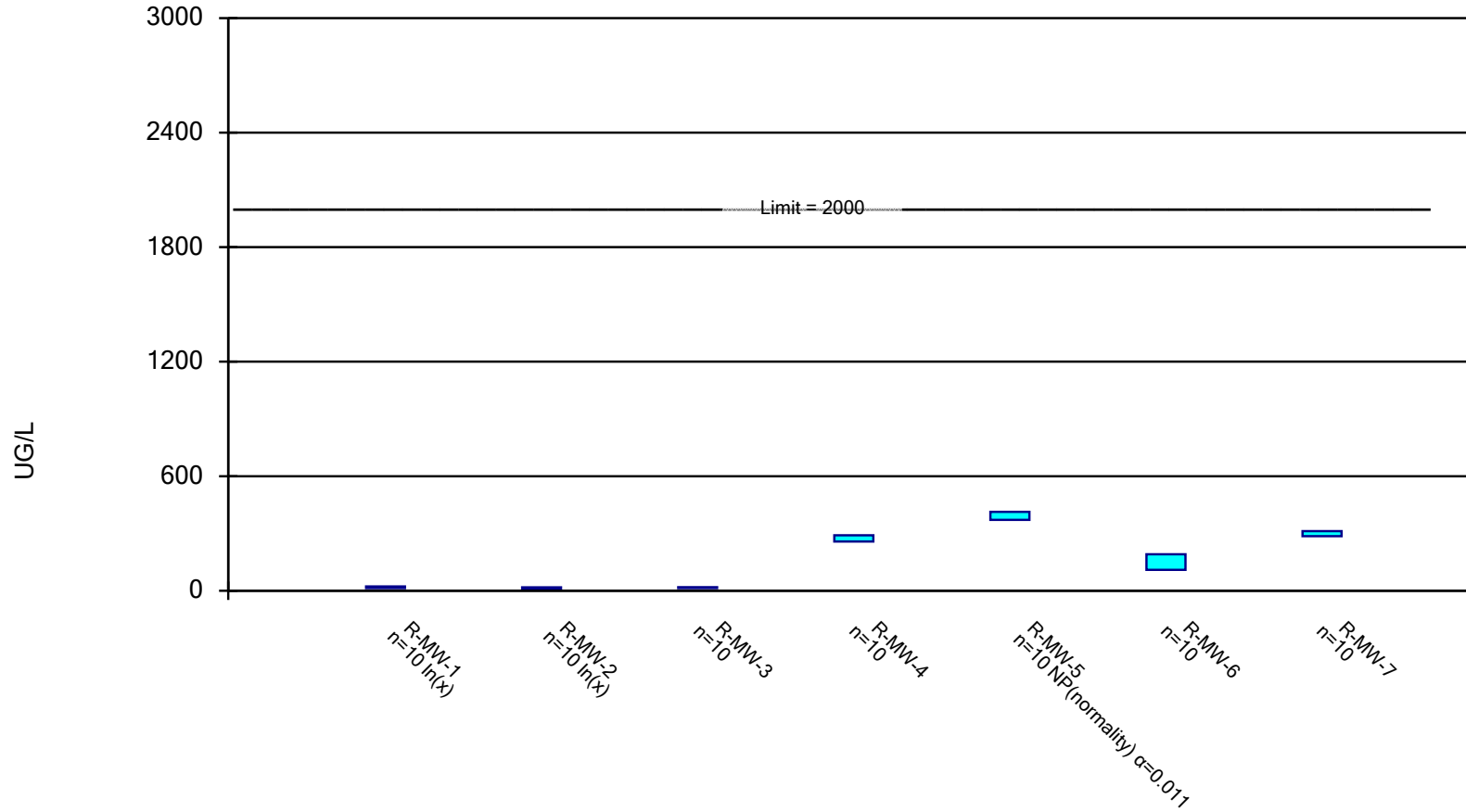


Constituent: ARSENIC, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

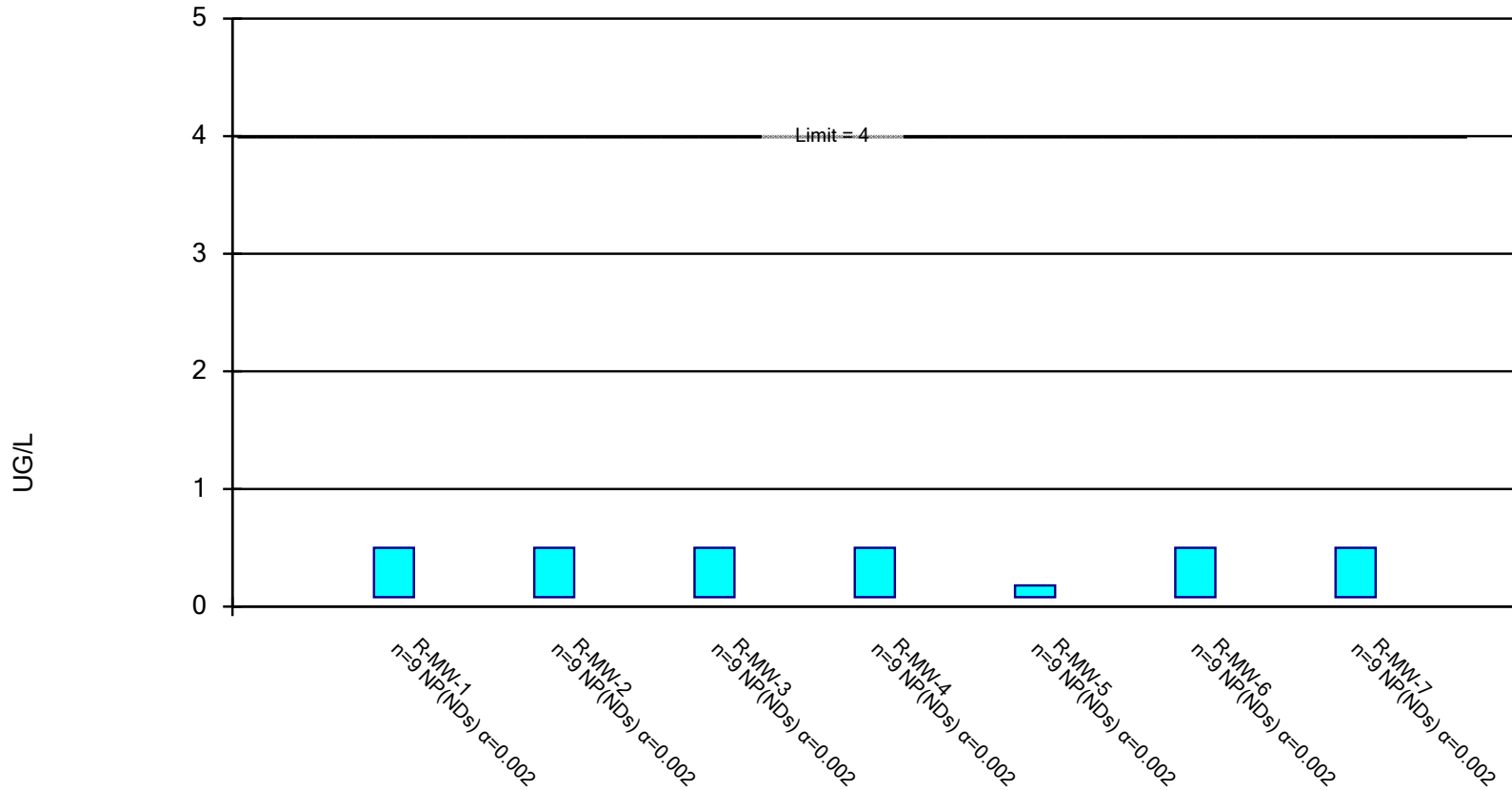


Constituent: BARIUM, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

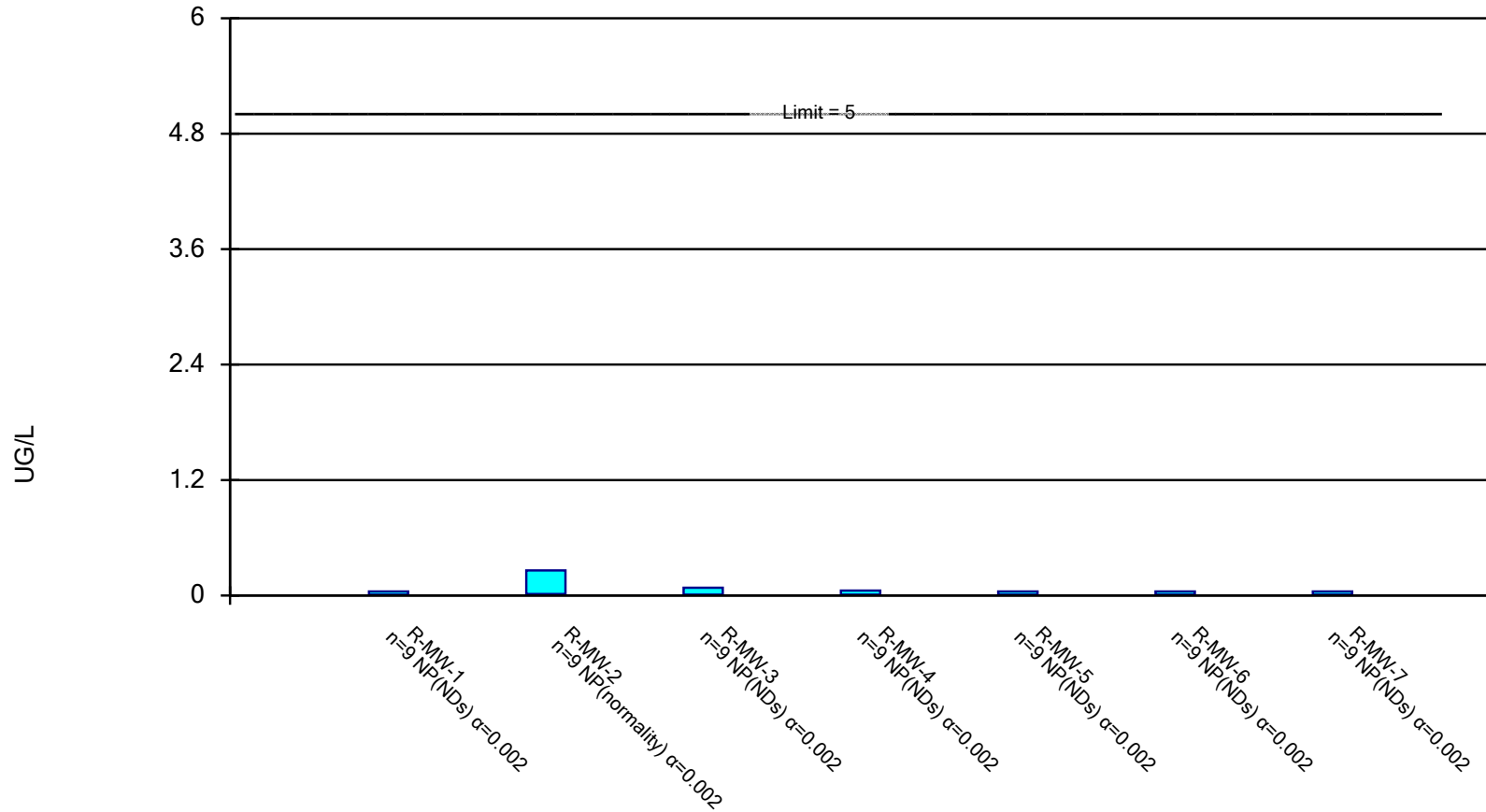


Constituent: BERYLLIUM, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

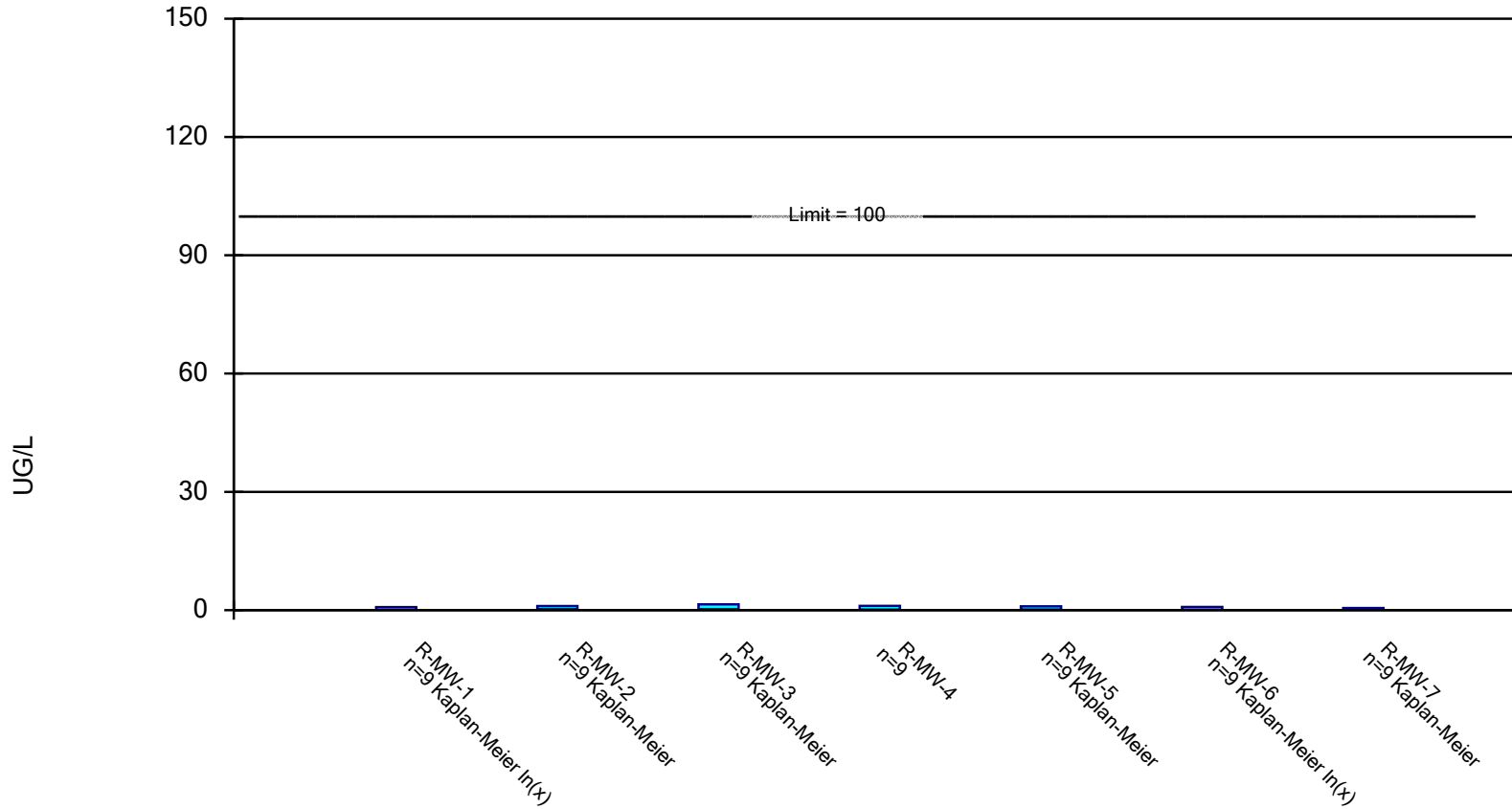


Constituent: CADMIUM, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

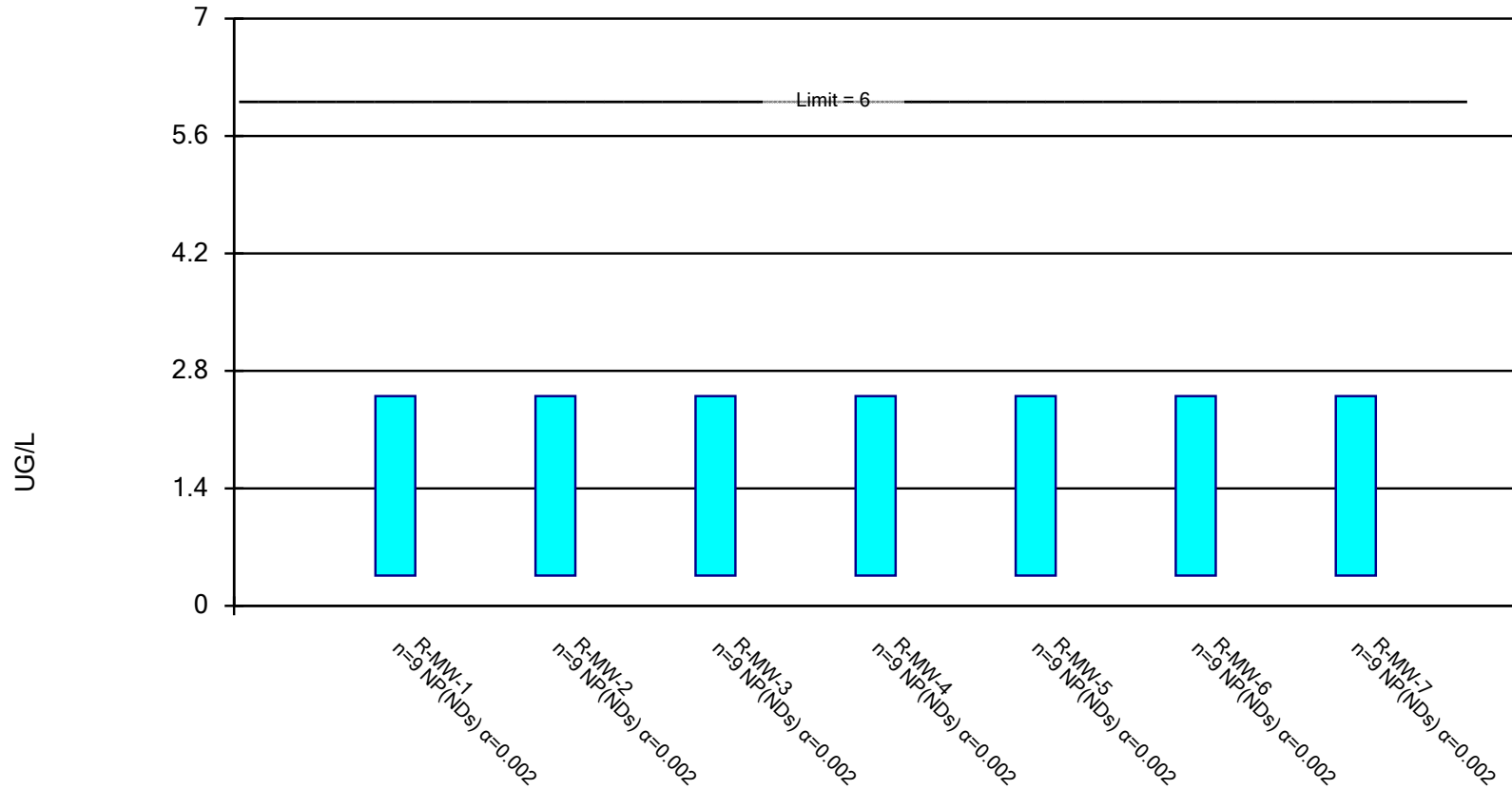


Constituent: CHROMIUM, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

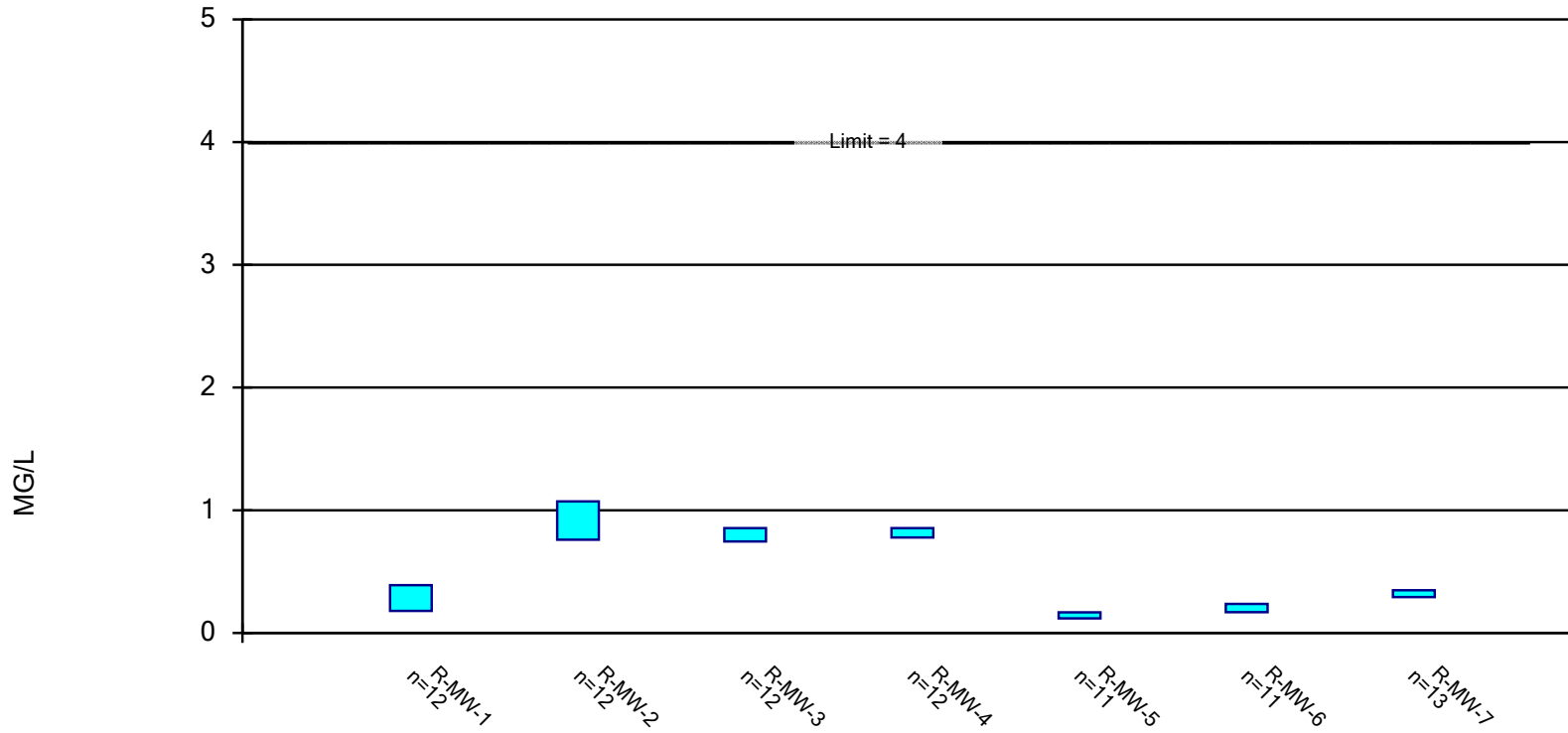


Constituent: COBALT, TOTAL Analysis Run 10/9/2018 1:30 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01. Normality Test: Shapiro Wilk, alpha based on n.

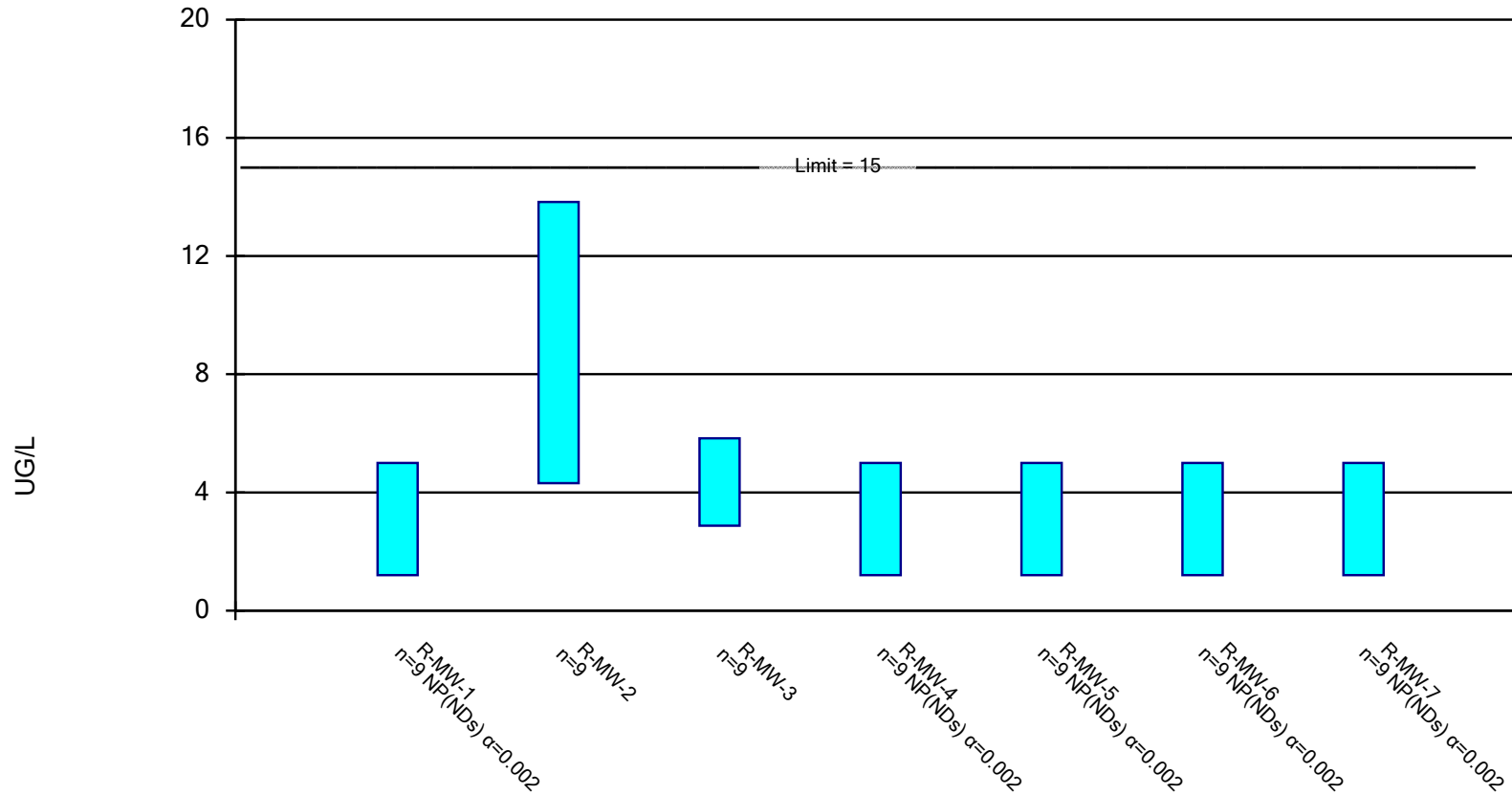


Constituent: FLUORIDE, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

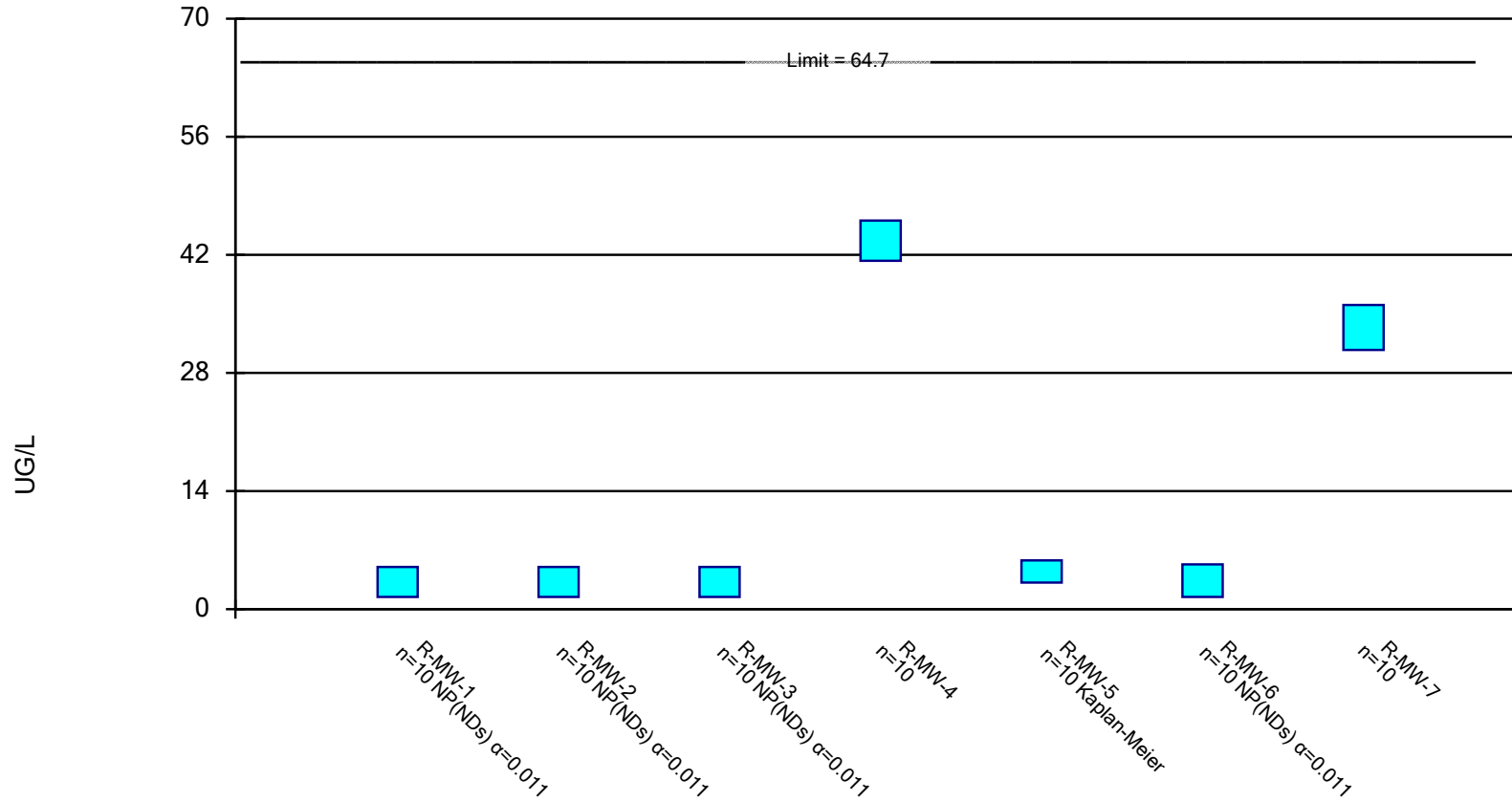


Constituent: LEAD, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

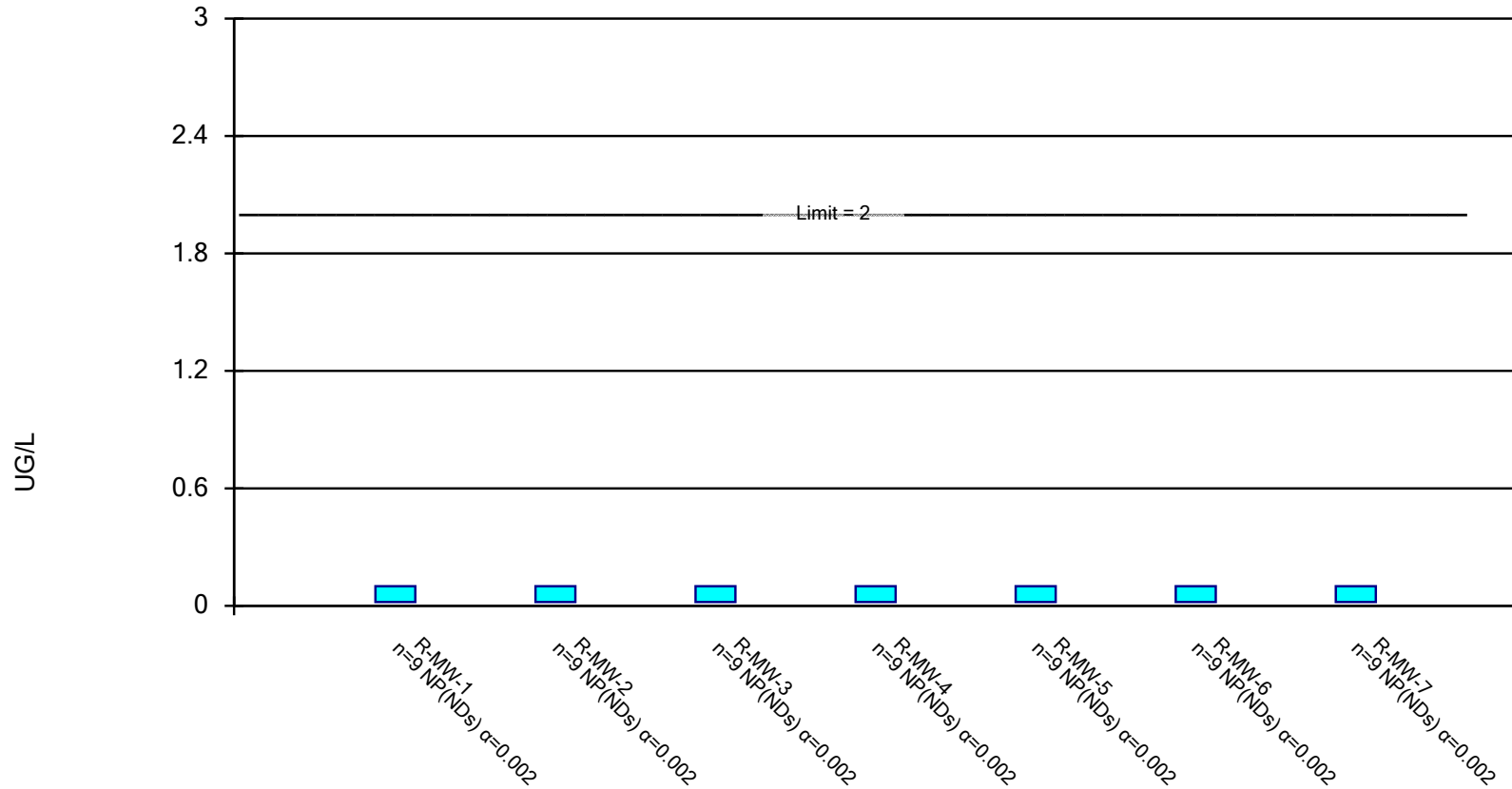


Constituent: LITHIUM, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

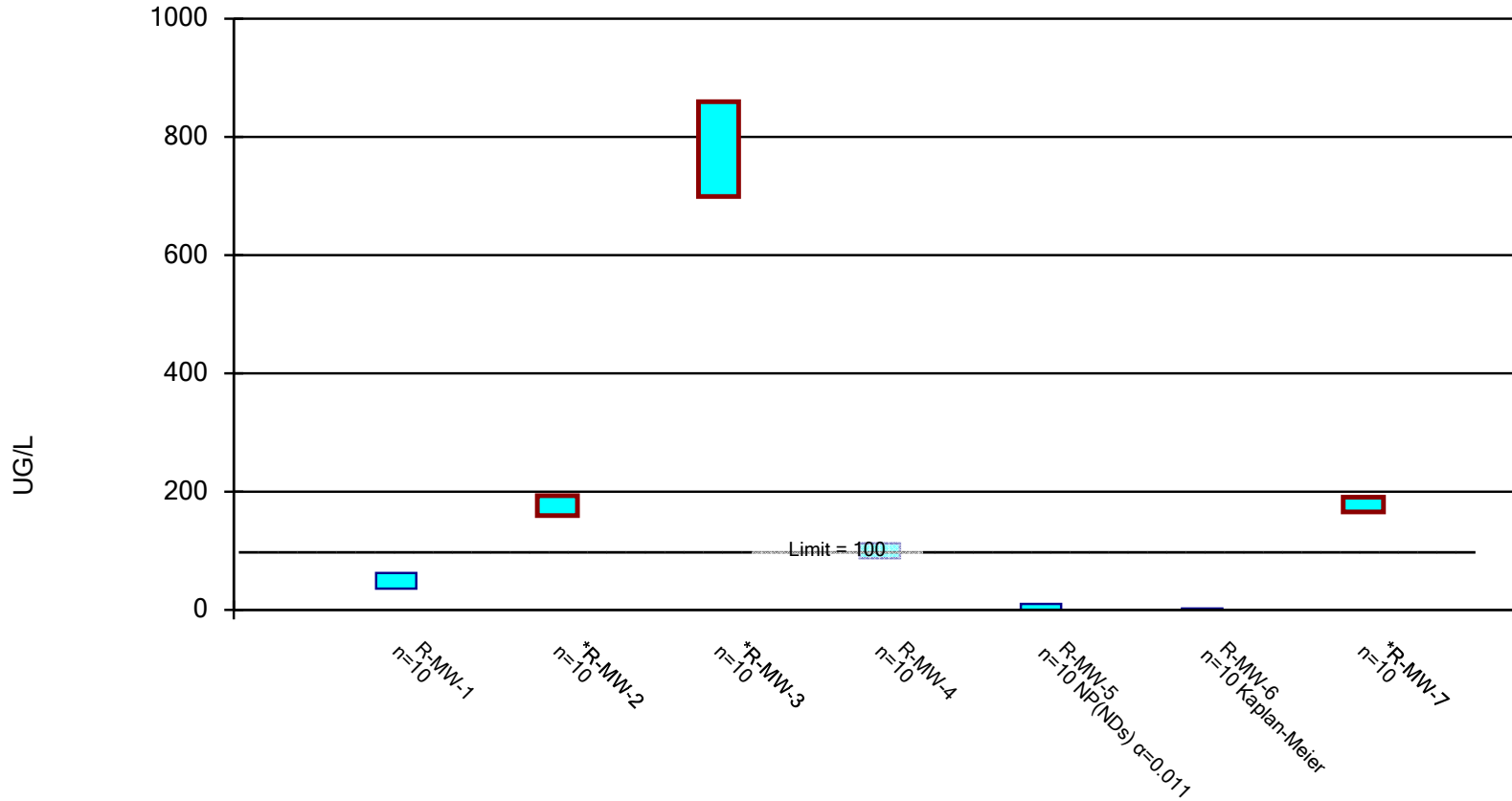


Constituent: MERCURY, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance limit is exceeded.* Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

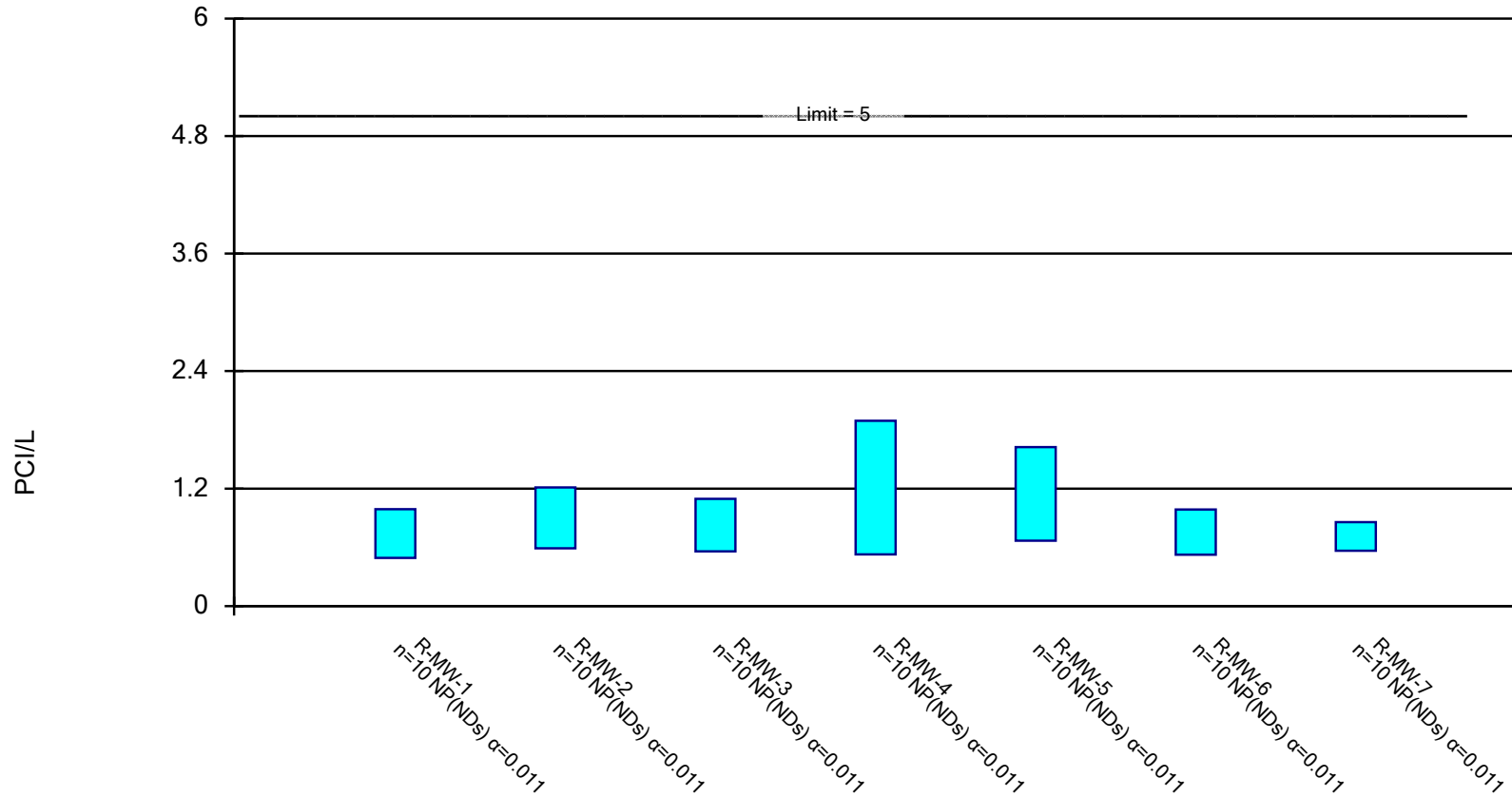


Constituent: MOLYBDENUM, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

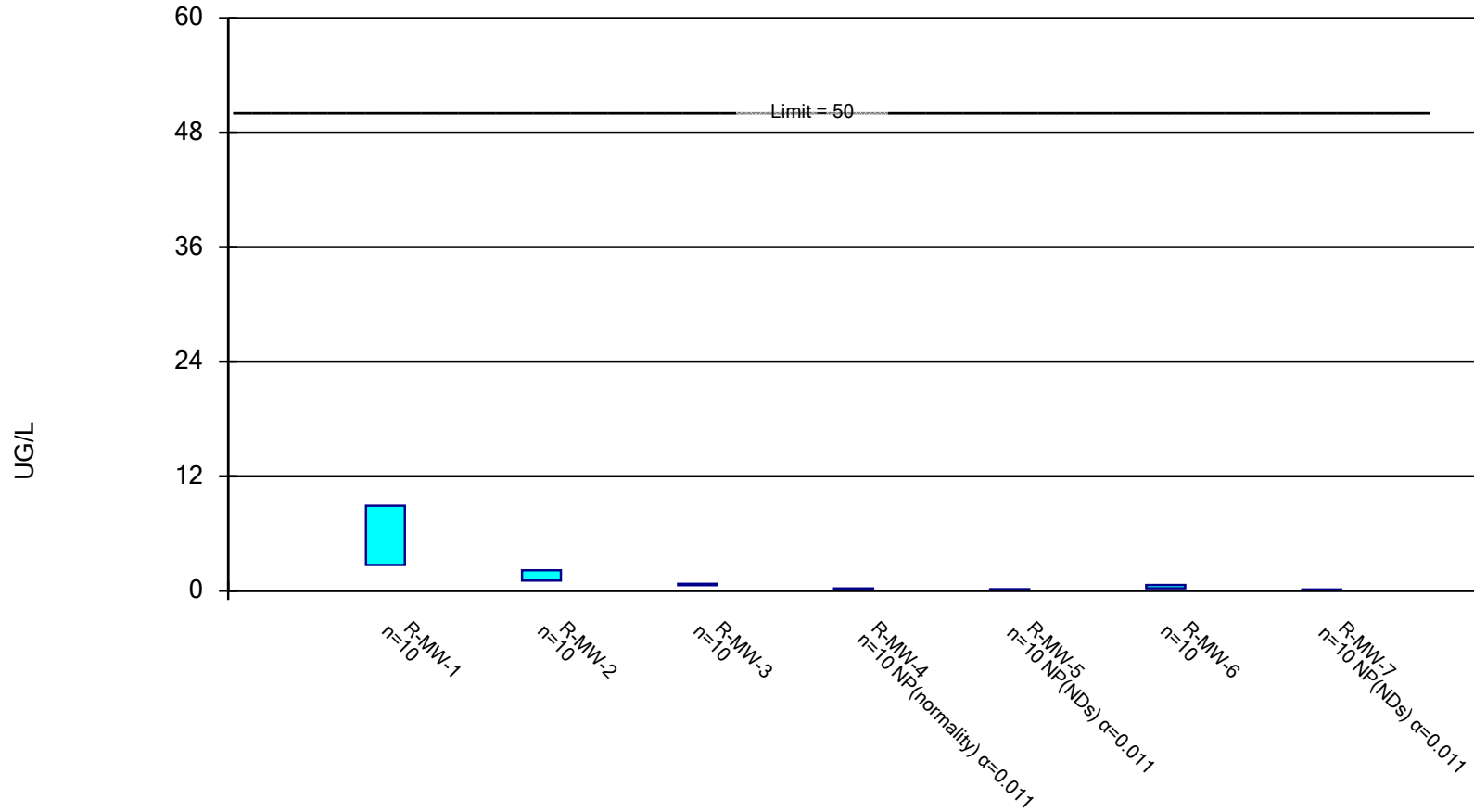


Constituent: RADIUM [226 + 228] Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Parametric and Non-Parametric (NP) Confidence Interval

Compliance Limit is not exceeded. Per-well alpha = 0.01 except as noted. Normality Test: Shapiro Wilk, alpha based on n.

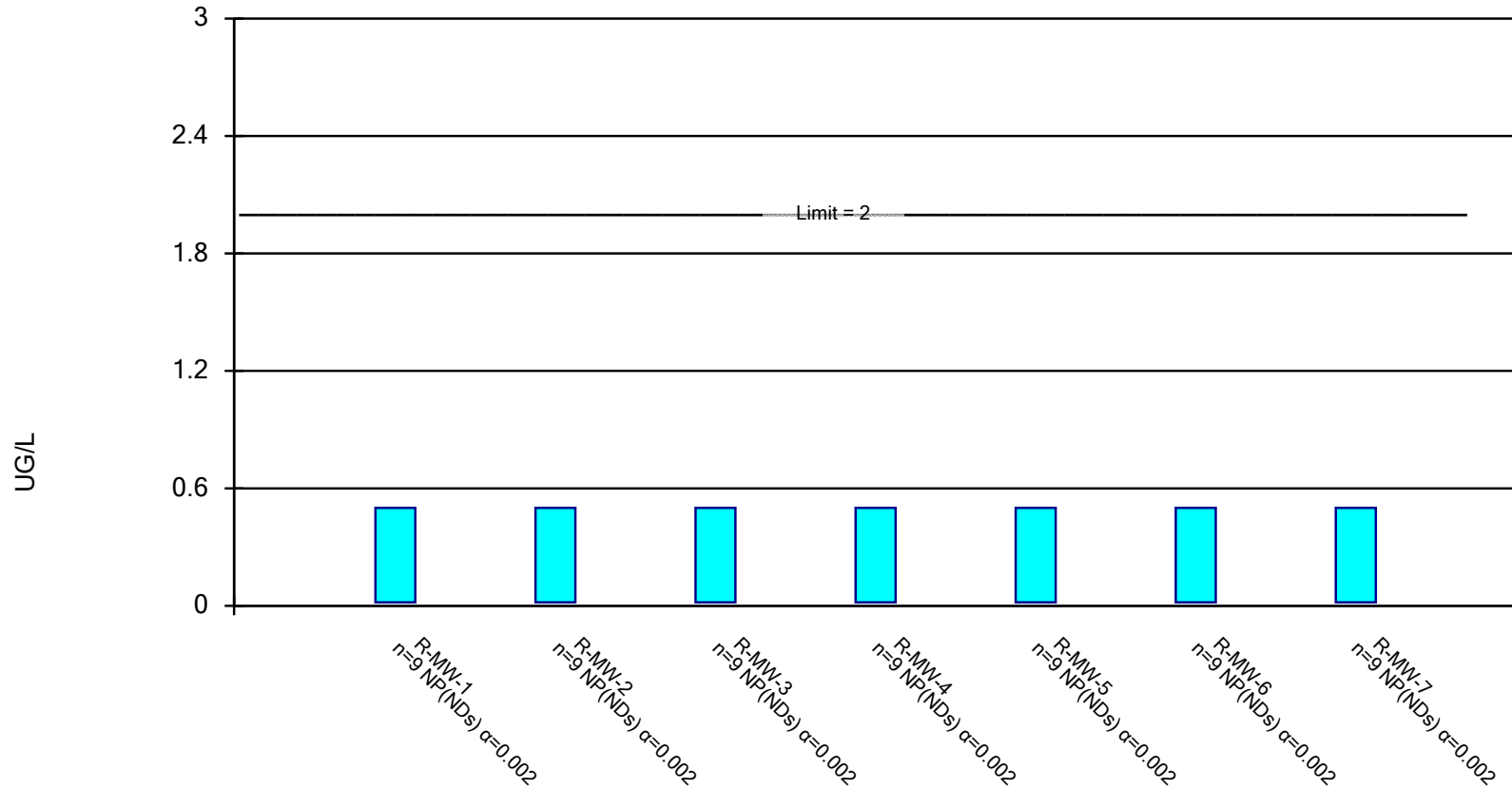


Constituent: SELENIUM, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: THALLIUM, TOTAL Analysis Run 10/9/2018 1:31 PM

Rush Island E.C. Client: Ameren Data: RIEC Data

Confidence Interval

Rush Island E.C. Client: Ameren Data: RIEC Data Printed 10/9/2018, 1:32 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
ANTIMONY, TOTAL (UG/L)	R-MW-1	1.027	0.3875	6	No	10	20	No	0.01	Param.
ANTIMONY, TOTAL (UG/L)	R-MW-2	5.614	4.466	6	No	10	0	No	0.01	Param.
ANTIMONY, TOTAL (UG/L)	R-MW-3	0.1648	0.07057	6	No	10	30	ln(x)	0.01	Param.
ANTIMONY, TOTAL (UG/L)	R-MW-4	0.12	0.0275	6	No	10	60	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	R-MW-5	0.11	0.013	6	No	10	80	No	0.011	NP (NDs)
ANTIMONY, TOTAL (UG/L)	R-MW-6	0.1091	0.04887	6	No	10	40	ln(x)	0.01	Param.
ANTIMONY, TOTAL (UG/L)	R-MW-7	0.5	0.013	6	No	10	70	No	0.011	NP (NDs)
ARSENIC, TOTAL (UG/L)	R-MW-1	15.8	7.983	30	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-2	250.1	221.7	30	Yes	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-3	88.36	39.68	30	Yes	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-4	8.415	6.294	30	No	10	0	ln(x)	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-5	4.806	3.774	30	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-6	0.7529	0.2697	30	No	10	20	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	R-MW-7	96.6	34.5	30	Yes	10	0	No	0.011	NP (normality)
BARIUM, TOTAL (UG/L)	R-MW-1	22.5	14.19	2000	No	10	0	ln(x)	0.01	Param.
BARIUM, TOTAL (UG/L)	R-MW-2	17.87	10.15	2000	No	10	0	ln(x)	0.01	Param.
BARIUM, TOTAL (UG/L)	R-MW-3	18.61	14.09	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	R-MW-4	290.1	257.5	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	R-MW-5	413	371	2000	No	10	0	No	0.011	NP (normality)
BARIUM, TOTAL (UG/L)	R-MW-6	191.2	109	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	R-MW-7	311.8	285.6	2000	No	10	0	No	0.01	Param.
BERYLLIUM, TOTAL (UG/L)	R-MW-1	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-2	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-3	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-4	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-5	0.18	0.08	4	No	9	88.89	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-6	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	R-MW-7	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-1	0.041	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-2	0.26	0.0145	5	No	9	22.22	No	0.002	NP (normality)
CADMIUM, TOTAL (UG/L)	R-MW-3	0.081	0.009	5	No	9	77.78	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-4	0.051	0.009	5	No	9	77.78	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-5	0.041	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-6	0.041	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	R-MW-7	0.041	0.009	5	No	9	77.78	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	R-MW-1	0.7696	0.05611	100	No	9	44.44	ln(x)	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-2	1.048	0.2698	100	No	9	22.22	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-3	1.455	0.2693	100	No	9	22.22	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-4	1.061	0.1592	100	No	9	11.11	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-5	0.9465	0.1331	100	No	9	22.22	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-6	0.7909	0.07211	100	No	9	44.44	ln(x)	0.01	Param.
CHROMIUM, TOTAL (UG/L)	R-MW-7	0.5192	0.08597	100	No	9	33.33	No	0.01	Param.
COBALT, TOTAL (UG/L)	R-MW-1	2.5	0.36	6	No	9	88.89	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-2	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-3	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-4	2.5	0.36	6	No	9	77.78	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-5	2.5	0.36	6	No	9	77.78	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-6	2.5	0.36	6	No	9	88.89	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	R-MW-7	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
FLUORIDE, TOTAL (MG/L)	R-MW-1	0.3892	0.1791	4	No	12	0	No	0.01	Param.

Confidence Interval

Rush Island E.C. Client: Ameren Data: RIEC Data Printed 10/9/2018, 1:32 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
FLUORIDE, TOTAL (MG/L)	R-MW-2	1.071	0.7603	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	R-MW-3	0.8549	0.7451	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	R-MW-4	0.8542	0.7775	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	R-MW-5	0.1682	0.1191	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	R-MW-6	0.2367	0.1688	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	R-MW-7	0.3475	0.2925	4	No	13	0	No	0.01	Param.
LEAD, TOTAL (UG/L)	R-MW-1	5	1.2	15	No	9	100	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	R-MW-2	13.83	4.314	15	No	9	11.11	No	0.01	Param.
LEAD, TOTAL (UG/L)	R-MW-3	5.829	2.871	15	No	9	11.11	No	0.01	Param.
LEAD, TOTAL (UG/L)	R-MW-4	5	1.2	15	No	9	88.89	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	R-MW-5	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	R-MW-6	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	R-MW-7	5	1.2	15	No	9	88.89	No	0.002	NP (NDs)
LITHIUM, TOTAL (UG/L)	R-MW-1	5	1.45	64.7	No	10	100	No	0.011	NP (NDs)
LITHIUM, TOTAL (UG/L)	R-MW-2	5	1.45	64.7	No	10	90	No	0.011	NP (NDs)
LITHIUM, TOTAL (UG/L)	R-MW-3	5	1.45	64.7	No	10	100	No	0.011	NP (NDs)
LITHIUM, TOTAL (UG/L)	R-MW-4	46.06	41.3	64.7	No	10	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	R-MW-5	5.775	3.158	64.7	No	10	50	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	R-MW-6	5.3	1.45	64.7	No	10	80	No	0.011	NP (NDs)
LITHIUM, TOTAL (UG/L)	R-MW-7	36.05	30.73	64.7	No	10	0	No	0.01	Param.
MERCURY, TOTAL (UG/L)	R-MW-1	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-2	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-3	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-4	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-5	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-6	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	R-MW-7	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	R-MW-1	62.24	36.06	100	No	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	R-MW-2	193.2	159.6	100	Yes	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	R-MW-3	859.5	699.1	100	Yes	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	R-MW-4	112.7	87.5	100	No	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	R-MW-5	10	0.26	100	No	10	60	No	0.011	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	R-MW-6	2.142	0.7137	100	No	10	30	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	R-MW-7	190.5	165.7	100	Yes	10	0	No	0.01	Param.
RADIUM [226 + 228] (PCI/L)	R-MW-1	0.99	0.493	5	No	10	100	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-2	1.211	0.59	5	No	10	100	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-3	1.094	0.559	5	No	10	90	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-4	1.892	0.5275	5	No	10	70	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-5	1.623	0.668	5	No	10	80	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-6	0.986	0.525	5	No	10	90	No	0.011	NP (NDs)
RADIUM [226 + 228] (PCI/L)	R-MW-7	0.8575	0.5655	5	No	10	100	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	R-MW-1	8.901	2.699	50	No	10	0	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	R-MW-2	2.144	1.064	50	No	10	0	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	R-MW-3	0.7271	0.5809	50	No	10	0	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	R-MW-4	0.24	0.09	50	No	10	50	No	0.011	NP (normality)
SELENIUM, TOTAL (UG/L)	R-MW-5	0.16	0.043	50	No	10	90	No	0.011	NP (NDs)
SELENIUM, TOTAL (UG/L)	R-MW-6	0.5956	0.2624	50	No	10	10	No	0.01	Param.
SELENIUM, TOTAL (UG/L)	R-MW-7	0.14	0.043	50	No	10	80	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-1	0.5	0.018	2	No	9	88.89	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-2	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)

Confidence Interval

Rush Island E.C. Client: Ameren Data: RIEC Data Printed 10/9/2018, 1:32 PM

<u>Constituent</u>	<u>Well</u>	<u>Upper Lim.</u>	<u>Lower Lim.</u>	<u>Compliance</u>	<u>Sig.</u>	<u>N</u>	<u>%NDs</u>	<u>Transform</u>	<u>Alpha</u>	<u>Method</u>
THALLIUM, TOTAL (UG/L)	R-MW-3	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-4	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-5	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-6	0.5	0.018	2	No	9	88.89	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	R-MW-7	0.5	0.018	2	No	9	88.89	No	0.002	NP (NDs)

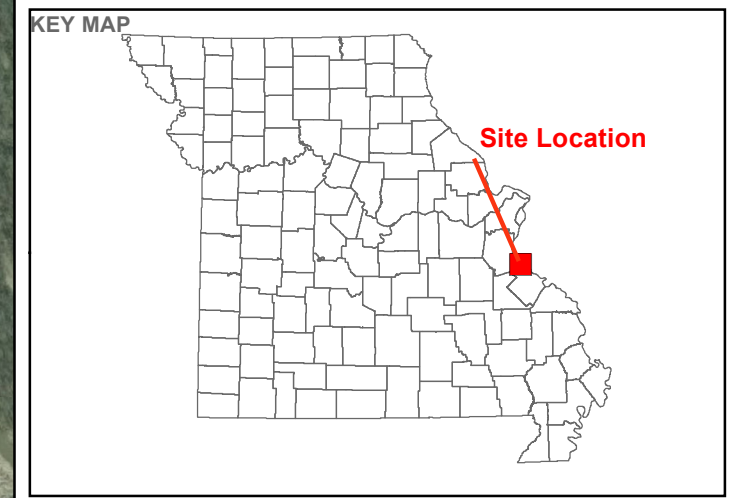
APPENDIX C

Potentiometric Surface Maps



LEGEND

- Rush Island Energy Center Property Boundary
- RCPA Surface Impoundment
- Groundwater Elevation Contour (FT MSL)**
- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)
- Ground/Surface Water Measurement Locations**
- Groundwater Monitoring Well
- Mississippi River Gauge
- RCPA Pond Gauge
- Groundwater Flow Direction



- NOTES**
- 1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
 - 2.) GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON DECEMBER 1, 2015.
 - 3.) GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
 - 4.) GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
 - 5.) MISSISSIPPI RIVER LEVEL PROVIDED BY AMEREN.
 - 6.) POND LEVEL OBTAINED ONSITE BY GOLDER.

- REFERENCES**
- 1.) AMEREN MISSOURI RUSH ISLAND ENERGY CENTER, RUSH ISLAND PROPERTY CONTROL MAP, JANUARY 2012.
 - 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.



CLIENT
 AMEREN MISSOURI
 RUSH ISLAND ENERGY CENTER



PROJECT
 CCR GROUNDWATER MONITORING PROGRAM

TITLE
 RCPA - POTENTIOMETRIC SURFACE MAP - APRIL 2, 2018

CONSULTANT	DATE	REVISION
	YYYY-MM-DD	2019-01-08
	PREPARED	EFT
	DESIGN	JSI
	REVIEW	EMS/JSI
	APPROVED	MNH

PROJECT No. 153-1406 PHASE 0002 Rev. 0.0 FIGURE C1

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



LEGEND

- Rush Island Energy Center Property Boundary
- RCPA Surface Impoundment

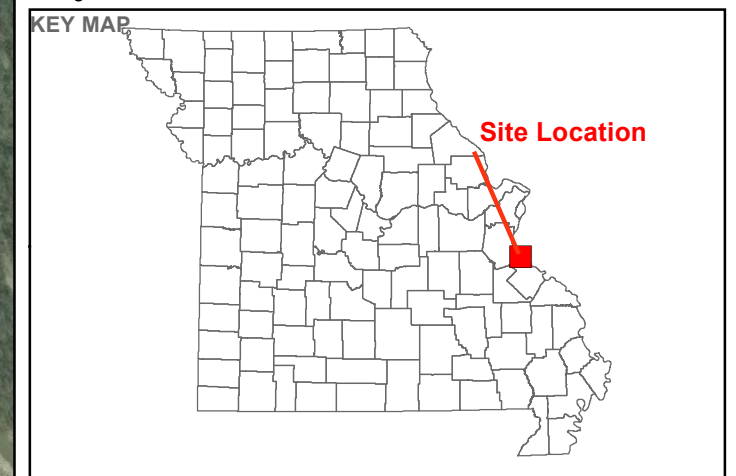
Ground/Surface Water Measurement Locations

- Groundwater Monitoring Well Monitoring Well Locations
- Mississippi River Gauge
- Mississippi River Gauge at NPDES Outfall
- RCPA Pond Gauge

Groundwater Elevation Contour (FT MSL)

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Groundwater Flow Direction



NOTES

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- 5.) MISSISSIPPI RIVER LEVEL PROVIDED BY AMEREN.
- 6.) POND LEVEL OBTAINED ONSITE BY GOLDER.
- 7.) MISSISSIPPI RIVER LEVEL AT THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) OUTFALL IS OBSERVED BY GOLDER FIELD STAFF AND IS CONSIDERED THE MOST ACCURATE MEASUREMENT.

REFERENCES

- 1.) AMEREN MISSOURI RUSH ISLAND ENERGY CENTER, RUSH ISLAND PROPERTY CONTROL MAP, JANUARY 2012.
- 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.

0 250 500 1,000
Feet

CLIENT			
AMEREN MISSOURI		RUSH ISLAND ENERGY CENTER	
PROJECT			
CCR GROUNDWATER MONITORING PROGRAM			
TITLE			
RCPA - POTENTIOMETRIC SURFACE MAP - MAY 24, 2018			
CONSULTANT		YYYY-MM-DD	2019-01-10
		PREPARED	EFT
		DESIGN	JSI
		REVIEW	EMS
		APPROVED	MNH
PROJECT No.	PHASE	Rev.	FIGURE
153-1406	0002	0.0	C2

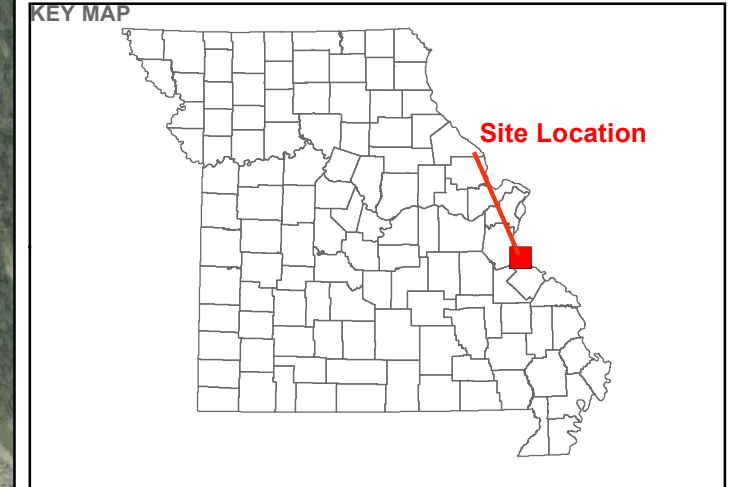
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LEGEND

- Rush Island Energy Center Property Boundary
- RCPA Surface Impoundment
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- Groundwater Elevation Contour (FT MSL)
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- REFERENCES**
- 1.) AMEREN MISSOURI RUSH ISLAND ENERGY CENTER, RUSH ISLAND PROPERTY CONTROL MAP, JANUARY 2012.
 - 2.) COORDINATE SYSTEM: NAD 1983 STATE PLANE MISSOURI EAST FIPS 2401 FEET.



CLIENT
 AMEREN MISSOURI
 RUSH ISLAND ENERGY CENTER



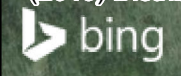
PROJECT
 CCR GROUNDWATER MONITORING PROGRAM

TITLE
 RCPA - POTENTIOMETRIC SURFACE MAP - NOVEMBER 1, 2018

CONSULTANT	YYYY-MM-DD	2019-01-29
GOLDER	PREPARED	EFT
	DESIGN	JSI
	REVIEW	JAP
	APPROVED	MNH

PROJECT No. 153-1406 PHASE 0002 FIGURE **C3**

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