2018 Annual Groundwater Monitoring and Corrective Action Report

Meramec Energy Center, St. Louis County, Missouri, USA

Submitted to:

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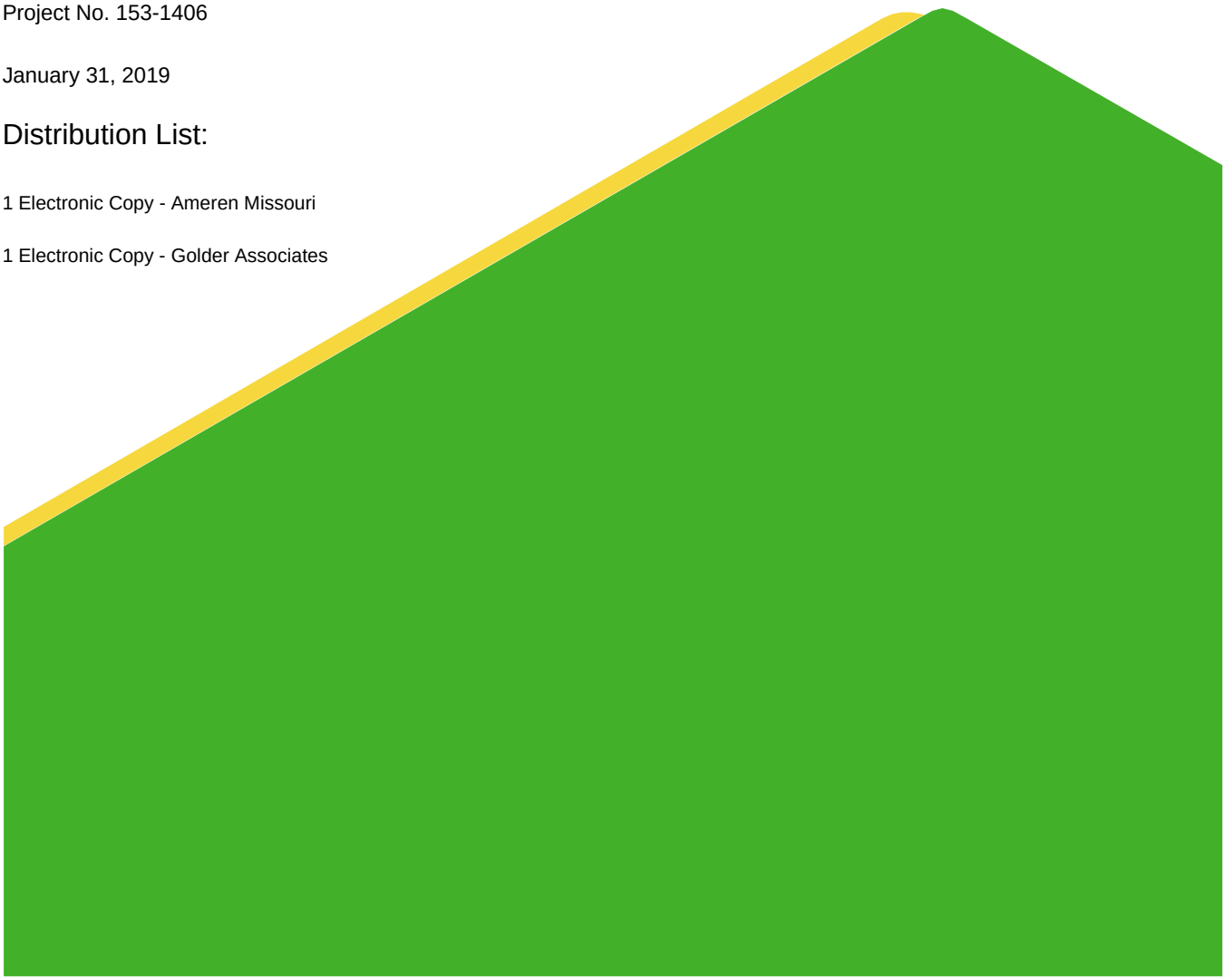

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1.0 INTRODUCTION

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 CCR Surface Impoundments at the Meramec Energy Center (MEC) are subject to the requirements of the CCR Rule. This Annual Report for the MEC 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 surface impoundments at the MEC. The groundwater monitoring system consists of ten (10) monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. Information on these monitoring wells is available in the 2017 Annual Groundwater Monitoring Report for the MEC.

In 2018, a nature and extent investigation was initiated and two (2) piezometers and two (2) monitoring wells were installed. A summary of the construction details of these new piezometers, wells, and the MEC well network is provided in **Table 1** and **Appendix A**. A map displaying the locations of these piezometers and wells is provided in **Figure 1**.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections review the sampling events completed for the surface impoundments at the MEC 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 6, 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 2-3, 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 B**. 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 17-18, 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 B**.

A Detection Monitoring event was completed November 19-20, 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 B**

3.2 Assessment Monitoring Program

After the determination of a verified SSI, an Assessment Monitoring Program was established for the surface impoundments at the MEC. The April 2018 Assessment Monitoring event was completed April 3-5, 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 B**. 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 17-18, 2018. A summary of the results is provided in **Table 7** and laboratory analytical data are provided in **Appendix B**.

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 MEC Groundwater Protection Standards (GWPS). The results from this analysis and a table that displays the site-specific GWPS are provided in **Appendix C**. Results from this evaluation indicated SSLs and a notification of the detection of the SSLs above MEC 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-4 and MW-5
- Lithium at MW-6
- Molybdenum at MW-6, MW-7 and MW-8

On November 19-20, 2018, the November 2018 Assessment Monitoring 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 corrective measures 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 of corrective measures or corrective measures selection 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 MEC 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 D**. As shown on the potentiometric surface maps, groundwater flow within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Mississippi and Meramec Rivers. 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 potentiometric surface maps, a general flow direction from the northeast (bluffs) to the southwest (Mississippi and Meramec Rivers) under normal river conditions is expected. However, during periods of high river levels, groundwater flow can temporarily reverse in localized areas. 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 Meramec surface impoundments is from the bluffs toward the rivers. Horizontal gradients calculated by the program for the CCR Rule compliance wells (not including background or MW-1) range from 0.0002 to 0.0005 feet/foot with an estimated net annual groundwater velocity of approximately 16 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 surface impoundments at the MEC. Currently, the surface impoundments at the MEC are in Assessment Monitoring and have begun an Assessment of Corrective Measures. Detection and Assessment Monitoring will continue as required by the CCR Rule.

4.1 Sampling Issues

Some of the wells used to monitor the surface impoundments at the MEC are located in the floodplain near the confluence of the Meramec and Mississippi Rivers. These monitoring wells can be submerged by minor flooding events that can occur multiple times each year. In 2018, it is estimated that at least one monitoring well at the MEC was partially submerged during the following dates:

- May 23-24
- June 27-July 16
- September 8-22
- October 3-November 10
- December 3-9

In 2018, monitoring well inspections following these minor flooding events at the MEC found that no wells sustained flood damage.

Due to high Practical Quantitation Limits (PQLs) and Method Detection Limits (MDLs) from laboratory equipment failure and laboratory error, lithium values from the May 2018 Assessment Monitoring event were flagged as outliers and not used for statistical analysis.

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 competed 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 measures will be completed and posted to the website as required by the CCR Rule.

Tables

Table 1
Summary of Well Construction Details
Meramec Surface Impoundments
Meramec Energy Center, St. Louis , MO

Monitoring Well ID	Installation Date	Location[4]		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								
MW-1	1/23/2016	937676.9	865954.1	406.43	404.1	370.2	365.0	39.1
MW-2	1/23/2016	937325.1	864864.5	398.62	396.1	367.0	361.8	34.3
MW-3	1/22/2016	936750.8	864447.2	397.12	394.6	369.2	364.0	30.6
MW-4	1/22/2016	935618.0	864629.8	404.10	402.0	364.1	358.9	43.1
MW-5	1/22/2016	934874.4	864781.0	402.93	400.8	350.4	340.2	60.6
MW-6	1/21/2016	933905.2	865153.5	418.12	415.8	373.4	363.2	52.7
MW-7	1/24/2016	934334.4	866242.5	417.94	415.7	373.2	363.0	52.7
MW-8	1/24/2016	935303.6	866797.8	423.37	421.0	355.8	345.6	75.4
BMW-1	4/7/2016	935220.4	867989.4	419.08	416.8	366.4	356.2	60.6
BMW-2	1/25/2016	937927.1	866342.2	409.02	406.8	369.3	364.1	42.7
NATURE AND EXTENT MONITORING WELLS								
MW-9 (AMW-1)	6/20/2018	935106.5	864425.3	393.71	391.1	369.8	359.5	31.6
MW-10 (AMW-2)	6/19/2018	934137.4	867158.9	405.62	402.8	367.3	357.0	45.8
TP-1	6/20/2018	935109.7	864437.0	393.71	390.7	306.1	301.0	89.7
TP-2	6/18/2018	934151.5	867171.1	405.22	402.4	316.9	311.8	90.6

Notes:

1) Horizontal Datum: State Plane Coordinates NAD83 (2000) Missouri East Zone feet.

2) FT MSL- Feet above mean sea level.

3) FT BGS - Feet below ground surface.

4) Vertical Datum: NAVD88 feet.

Prepared by: EMS
Checked by: JAP
Reviewed by: MNH

Table 2
Summary of Groundwater Sampling Dates
Meramec Surface Impoundments
Meramec Energy Center, St. Louis 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
BMW-1	-	4/4/2018	5/17/2018	-	-	11/19/2018
BMW-2	-	4/4/2018	5/17/2018	-	-	11/19/2018
MW-1	1/3/2018	4/4/2018	5/18/2018	-	-	11/20/2018
MW-2	1/2/2018	4/4/2018	5/17/2018	-	-	11/19/2018
MW-3	1/2/2018	4/4/2018	5/17/2018	7/3/2018	-	11/19/2018
MW-4	1/3/2018	4/4/2018	5/17/2018	-	-	11/19/2018
MW-5	1/3/2018	4/5/2018	5/18/2018	-	-	11/19/2018
MW-6	1/3/2018	4/3/2018	5/18/2018	-	-	11/19/2018
MW-7	1/3/2018	4/3/2018	5/18/2018	-	-	11/19/2018
MW-8	1/3/2018	4/5/2018	5/17/2018	-	-	11/19/2018
MW-9	-	-	-	-	11/20/2018	-
MW-10	-	-	-	-	11/19/2018	-
TP-1	-	-	-	-	11/20/2018	-
TP-2	-	-	-	-	11/19/2018	-
Detection or Assessment Monitoring	Detection	Assessment	Assessment/ Detection	Detection	Assessment	Assessment/ Detection

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 tested for Appendix IV Parameters.

4.) "-" No sample collected.

5.) NA - Not applicable.

Prepared by: MSG/JAP
Checked by: TJG
Reviewed by: MNH

Table 3
November 2017 Detection Monitoring Results
Meramec Surface Impoundments
Meramec Energy Center, St. Louis County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
			BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
November 2017 Detection Monitoring Event												
DATE	NA	NA	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017	11/6/2017
pH	SU	6.352-7.76	7.18	6.71	6.82	6.58	6.69	6.92	7.16	6.73	7.16	6.90
BORON, TOTAL	µg/L	476.5	375	ND	ND	5,080	6,660	8,540	8,720	8,600	25,600	7,600
CALCIUM, TOTAL	µg/L	115,956	101,000	93,100	126,000	130,000	151,000	172,000	172,000	387,000	429,000	154,000
CHLORIDE, TOTAL	mg/L	248	126	12.8	42.4	23.6	31.7	42.6	40.1	12.2	89.0	24.7
FLUORIDE, TOTAL	mg/L	0.5034	0.48	0.28	0.26	0.11 J	ND	0.14 J	0.18 J	0.30	0.61	0.23
SULFATE, TOTAL	mg/L	127	164	20.8	102	330	318	404	426	696	1,220	435
TOTAL DISSOLVED SOLIDS	mg/L	832	764	400	612	172 J	809	928	1,030	1,590	2,320	917
January 2018 Verification Sampling												
DATE	NA	NA			1/3/2018	1/2/2018	1/2/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018	1/3/2018
pH	SU	6.352-7.76										
BORON, TOTAL	µg/L	476.5				6,950	8,020	8,780	8,810	6,450	25,000	9,360
CALCIUM, TOTAL	µg/L	115,956			143,000	129,000	158,000	184,000	176,000	376,000	435,000	185,000
CHLORIDE, TOTAL	mg/L	248										
FLUORIDE, TOTAL	mg/L	0.5034									0.35	
SULFATE, TOTAL	mg/L	127				356	391	453	428	599	921	489
TOTAL DISSOLVED SOLIDS	mg/L	832						980	1,010	1,350	1,870	919

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. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
8. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.

Prepared By: JSI
Checked By: JAP
Reviewed By: MNH

Table 4
May 2018 Detection Monitoring Results
Meramec Surface Impoundments
Meramec Energy Center, St. Louis County, MO

ANALYTE	UNITS	PREDICTION LIMITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
			BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
May 2018 Detection Monitoring Event												
DATE	NA	NA	5/17/2018	5/17/2018	5/18/2018	5/17/2018	5/17/2018	5/17/2018	5/18/2018	5/18/2018	5/18/2018	5/17/2018
pH	SU	6.352-7.76	7.06	7.07	7.03	6.43	6.70	6.77	6.78	6.50	7.18	7.01
BORON, TOTAL	µg/L	476.5	554	67.0	44.0 J	4,210	9,560	10,300	9,240	13,800	26,900	10,100
CALCIUM, TOTAL	µg/L	115,956	132,000	115,000	141,000	133,000	166,000	199,000	184,000	409,000	414,000	198,000
CHLORIDE, TOTAL	mg/L	248	152	12.8	43.9	32.5	37.9	50.6	42.0	18.4	72.4	23.5
FLUORIDE, TOTAL	mg/L	0.5034	0.36	0.31	0.28	0.13 J	0.12 J	0.18 J	0.24	0.15 J	0.40	0.23
SULFATE, TOTAL	mg/L	127	84.3	19.7	105	287	387	527	386	709	1,070	536
TOTAL DISSOLVED SOLIDS	mg/L	832	770	471	668	823	905	1,110	992	1,490	1,900	947
July 2018 Verification Sampling												
DATE	NA	NA					7/3/2018					
pH	SU	6.352-7.76					6.5					
BORON, TOTAL	µg/L	476.5										
CALCIUM, TOTAL	µg/L	115,956										
CHLORIDE, TOTAL	mg/L	248										
FLUORIDE, TOTAL	mg/L	0.5034										
SULFATE, TOTAL	mg/L	127										
TOTAL DISSOLVED SOLIDS	mg/L	832					926					

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. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
7. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
8. 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: JAP
Reviewed By: MNH

Table 5
November 2018 Detection Monitoring Results
Meramec Surface Impoundments
Meramec Energy Center, St. Louis County, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
November 2018 Detection Monitoring Event											
DATE	NA	11/19/2018	11/19/2018	11/20/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018
pH	SU	7.24	7.03	6.84	6.73	6.90	7.20	7.54	6.56	6.97	6.79
BORON, TOTAL	µg/L	468	98.0 J	52.3 J	4,380	9,320	9,630	7,040	12,800	23,700	9,130
CALCIUM, TOTAL	µg/L	103,000	98,000	132,000	119,000	152,000	179,000	137,000	358,000	390,000	171,000
CHLORIDE, TOTAL	mg/L	137	12.8	43.1	31.3	35.7	51.1	43.9	18.0	54.4	24.5
FLUORIDE, TOTAL	mg/L	0.43	0.35	0.30	ND	ND	ND	0.22	ND	0.31 J	0.22
SULFATE, TOTAL	mg/L	63.4	25.7	103	315	388	483	277	632	1,210	470
TOTAL DISSOLVED SOLIDS	mg/L	640	481	628	796	875	895	817	1,430	1,960	936

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.

Prepared By: JSI
Checked By: JAP
Reviewed By: MNH

Table 6
April 2018 Assessment Monitoring Results
MEC Surface Impoundments
Meramec Energy Center, St. Louis, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
Field Parameters											
DATE	NA	4/4/2018	4/4/2018	4/4/2018	4/4/2018	4/4/2018	4/4/2018	4/5/2018	4/3/2018	4/3/2018	4/5/2018
DISSOLVED OXYGEN	mg/L	0.98	0.77	0.47	0.66	0.74	0.83	0.69	1.51	1.25	1.31
pH	SU	7.36	6.82	7.19	6.45	6.61	6.85	7.61	7.00	7.20	6.83
REDOX POTENTIAL	mV	-76.7	-89.2	-82.8	-100.2	-118.8	-145.1	14.6	32.9	-17.0	-51.5
SPECIFIC CONDUCTIVITY	mS/cm	1.280	0.883	1.104	1.143	1.247	1.419	1.392	1.876	2.221	1.210
TURBIDITY	NTU	4.17	8.78	13.8	7.60	9.44	7.34	0.79	2.55	3.34	7.00
Appendix IV Parameters											
ANTIMONY, TOTAL	µg/L	0.51 J	ND	0.028 J	0.16 J	ND	0.027 J	ND	0.043 J	0.42 J	ND
ARSENIC, TOTAL	µg/L	1.9	1.1	0.71 J	1.8	8.1	14.4	22.1	4.9	3.2	6.0
BARIUM, TOTAL	µg/L	237	537	359	324	253	214	245	53.8	41.8	199
BERYLLIUM, TOTAL	µg/L	ND	ND	0.17 J	ND	ND	0.28 J	ND	0.36 J	0.35 J	ND
CADMIUM, TOTAL	µg/L	ND	0.31 J	0.22 J	ND	0.11 J	0.16 J	ND	0.069 J	0.22 J	0.035 J
CHROMIUM, TOTAL	µg/L	0.11 J	0.45 J	0.74 J	0.16 J	0.34 J	0.33 J	0.22 J	2.4	ND	0.20 J
COBALT, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	4.1 J	ND	ND
FLUORIDE, TOTAL	mg/L	0.18 J	0.10 J	0.069 J	ND	ND	ND	0.10 J	0.13 J	0.31 J	ND
LEAD, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.4 J
LITHIUM, TOTAL	µg/L	13.8	9.3 J	7.1 J	8.2 J	9.0 J	27.0	26.2	144	62.0	32.4
MERCURY, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MOLYBDENUM, TOTAL	µg/L	4.3 J	ND	ND	ND	2.6 J	55.0	98.3	134	502	192
RADIUM [226 + 228]	pCi/L	1.199	ND	ND	ND	1.736	ND	ND	ND	ND	ND
SELENIUM, TOTAL	µg/L	ND	ND	0.10 J	ND	ND	0.12 J	ND	ND	0.45 J	ND
THALLIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	ND	0.12 J	ND

NOTES:

1. Unit Abbreviations: µg/L - micrograms per liter, mg/L - milligrams per liter, SU - standard units, and pCi/L - picocuries per liter, mV - millivolts, mS/cm - millisiemens per centimeter, NTU - nephelometric turbidity unit.
2. J - Result is an estimated value.
3. ND - Constituent was analyzed for, but was not detected above the Method Detection Limit (MDL) and is considered a non-detect. 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.

Prepared By: JAP
Checked By: MSG
Reviewed By: MNH

Table 7
May 2018 Assessment Monitoring Results
MEC Surface Impoundments
Meramec Energy Center, St. Louis, MO

ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
Field Parameters											
DATE	NA	5/17/2018	5/17/2018	5/18/2018	5/17/2018	5/17/2018	5/17/2018	5/18/2018	5/18/2018	5/18/2018	5/17/2018
DISSOLVED OXYGEN	mg/L	1.55	0.83	0.59	0.40	0.86	0.49	1.13	1.42	0.56	0.95
pH	SU	7.06	7.07	7.03	6.43	6.70	6.77	6.78	6.50	7.18	7.01
REDOX POTENTIAL	mV	13.7	-76.9	-89.5	-89.1	-89.2	-100.3	38.9	2.4	8.0	-69.0
SPECIFIC CONDUCTIVITY	mS/cm	1.252	0.820	1.089	1.148	1.274	1.417	1.447	1.913	2.186	1.181
TURBIDITY	NTU	3.50	2.21	4.12	8.15	14.8	9.46	4.74	3.94	2.98	4.35
Appendix IV Parameters											
ARSENIC, TOTAL	µg/L	1.5	1.7	1.2	2.5	8.3	15.0	22.1	5.5	4.8	6.5
BARIUM, TOTAL	µg/L	251	566	358	328	264	218	259	55.0	40.2	196
CHROMIUM, TOTAL	µg/L	ND	ND	0.52 J	ND	0.64 J	ND	ND	0.71 J	ND	ND
FLUORIDE, TOTAL	mg/L	0.36	0.31	0.28	0.13 J	0.12 J	0.18 J	0.24	0.15 J	0.40	0.23
LITHIUM, TOTAL	µg/L	ND	ND	ND	ND	ND	ND	ND	419 J	287 J	ND
MOLYBDENUM, TOTAL	µg/L	5.1 J	ND	ND	ND	ND	55.6	105	140	560	205
RADIUM [226 + 228]	pCi/L	ND	ND	ND	1.930 J	1.490	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.

Prepared By: JAP
Checked By: MSG
Reviewed By: MNH

Table 8
November 2018 Assessment Monitoring Results
MEC Surface Impoundments
Meramec Energy Center, St. Louis, MO

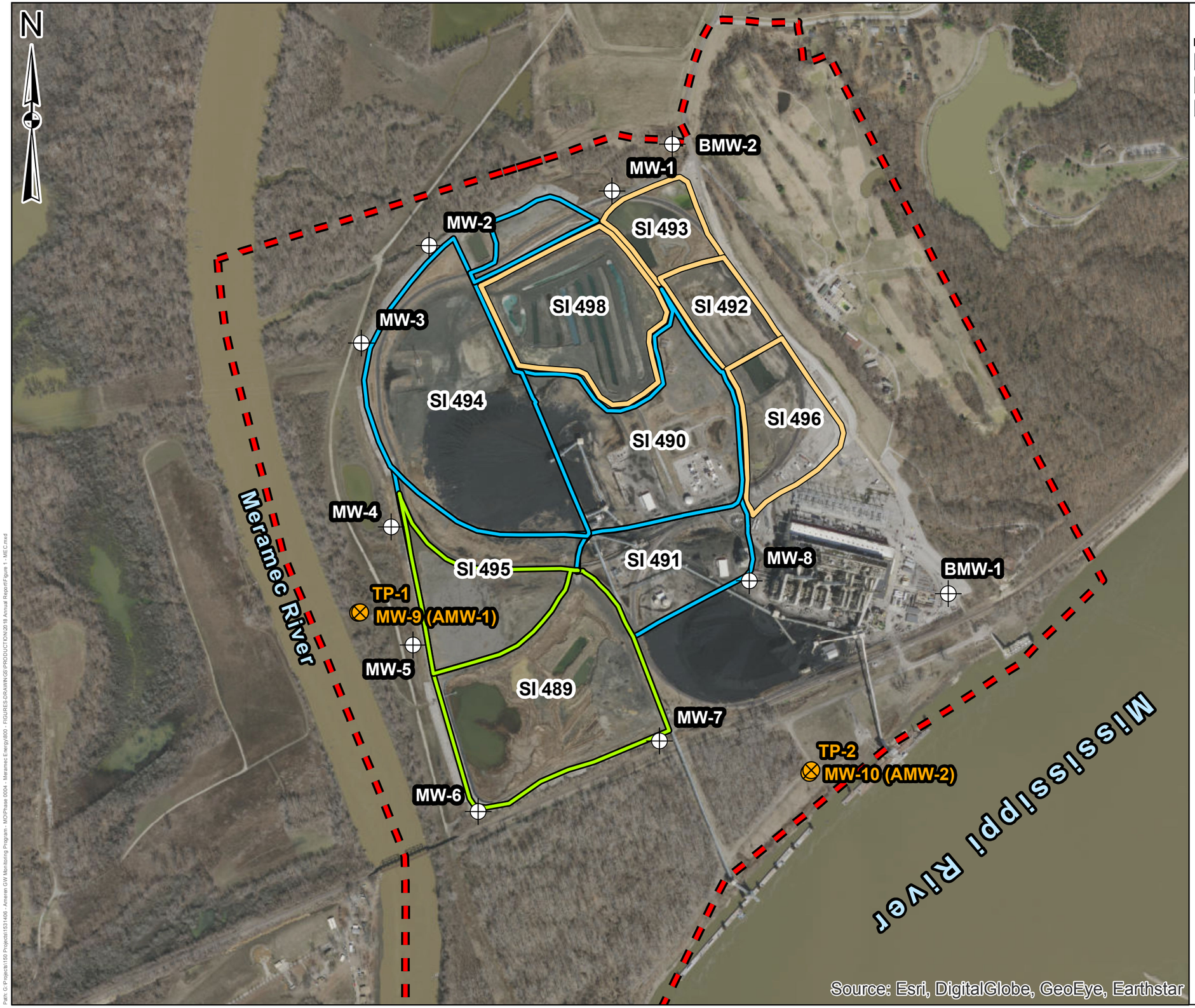
ANALYTE	UNITS	BACKGROUND		GROUNDWATER MONITORING WELLS							
		BMW-1	BMW-2	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8
Field Parameters											
DATE	NA	11/19/2018	11/19/2018	11/20/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018	11/19/2018
DISSOLVED OXYGEN	mg/L	0.18	0.15	0.12	0.86	0.71	0.58	0.83	0.15	6.03	0.11
pH	SU	7.24	7.03	6.84	6.73	6.90	7.20	7.54	6.56	6.97	6.79
REDOX POTENTIAL	mV	41.7	-136.9	-33.0	-39.8	-39.0	-45.0	-37.5	-33.7	-29.3	-41.6
SPECIFIC CONDUCTIVITY	mS/cm	1.266	0.985	0.820	1.060	1.171	1.292	1.083	1.230	1.570	0.880
TURBIDITY	NTU	4.50	4.18	4.88	2.81	3.21	4.30	4.61	1.60	0.02	4.74
Appendix IV Parameters											
ARSENIC, TOTAL	µg/L	1.4	1.1	0.68 J	1.7	7.8	14.8	1.8	2.9	2.6	5.8
BARIUM, TOTAL	µg/L	204	524	370	299	232	200	195	49.4	37.9	168
CHROMIUM, TOTAL	µg/L	0.11 J	0.45 J	0.36 J	0.31 J	ND	0.25 J	0.14 J	0.12 J	0.25 J	ND
FLUORIDE, TOTAL	mg/L	0.43	0.35	0.30	ND	ND	ND	0.22	ND	0.31 J	0.22
LITHIUM, TOTAL	µg/L	15.0	6.5 J	5.3 J	6.4 J	ND	23.3	18.1	131	48.6	33.7
MOLYBDENUM, TOTAL	µg/L	4.6 J	ND	ND	ND	3.6 J	51.1	101	135	461	183
RADIUM [226 + 228]	pCi/L	2.676	1.607	1.663 J	2.160	2.410	ND	1.399	ND	1.376 J	2.474

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.

Prepared By: JAP
Checked By: MSG
Reviewed By: MNH

Figures



LEGEND

- Meramec Energy Center Property Boundary
- Active Surface Impoundment
- Capped and Closed Surface Impoundment
- Exempt Surface Impoundment
- CCR Rule Monitoring Well Location
- Nature and Extent Monitoring Well Location

KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. SI - SURFACE IMPOUNDMENT.
3. EXEMPT SURFACE IMPOUNDMENTS ARE EXCLUDED FROM COAL COMBUSTION RESIDUALS MONITORING.
4. GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC.

REFERENCES

1.) AMEREN MISSOURI MERAMEC ENERGY CENTER, MERAMEC PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2401 FEET.

0 250 500 1,000 1,500 Feet

CLIENT
AMEREN MISSOURI
MERAMEC ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

CONSULTANT
GOLDER

YYYY-MM-DD	2018-12-20
PREPARED	JSI
DESIGN	JSI
REVIEW	MSG
APPROVED	MNH

PROJECT No. 153-1406 PHASE 0004 FIGURE 1

Path: G:\Projects\153\Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0004 - Meramec Energy\800 - FIGURES-DRAWINGS\PRODUCTION\2018 Annual Report\Figure 1 - MEC.mxd

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

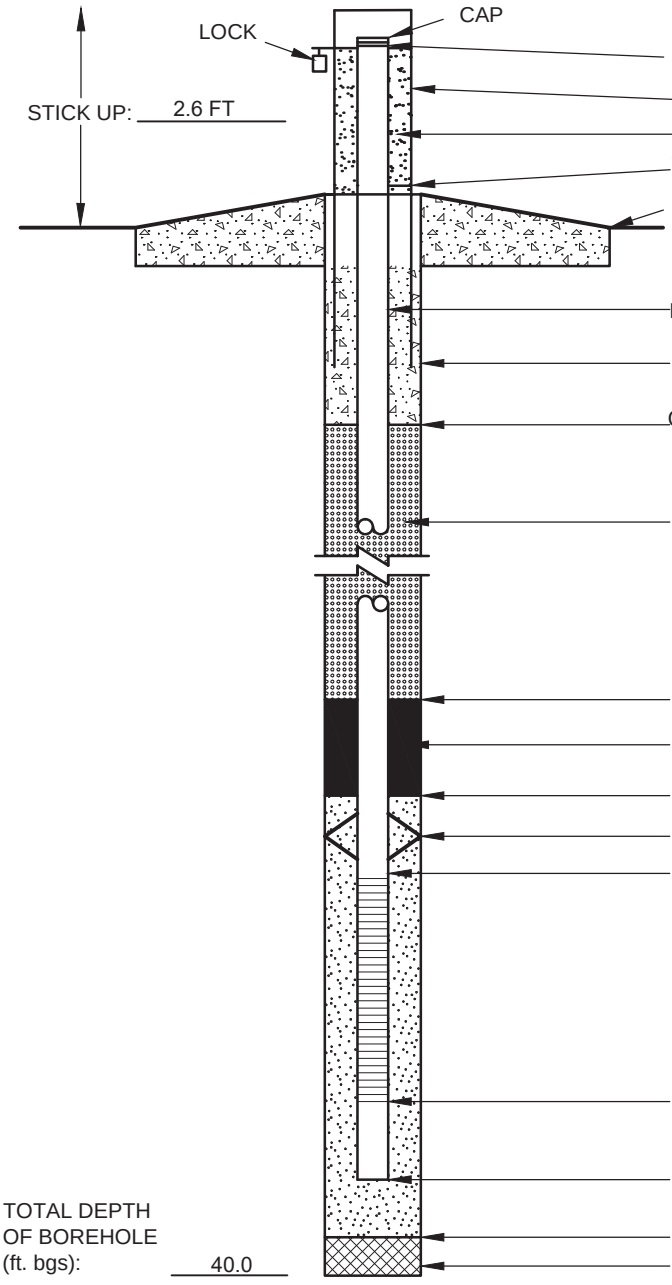
Appendices

APPENDIX A

Well Construction Diagrams

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG MW-9 (AMW-1)

PROJECT NAME: AMEREN NATURE AND EXTENT		PROJECT NUMBER: 153-1406.0004C
SITE NAME: MERAMEC ENERGY CENTER		LOCATION: MW-9 (AMW-1)
CLIENT: AMEREN MISSOURI		SURFACE ELEVATION: 391.12 FT MSL
GEOLOGIST: R. FELDMANN	NORTHING: 935106.5	EASTING: 864425.3
DRILLER: M. PATRICK	STATIC WATER LEVEL: 11.23 FT BGS	COMPLETION DATE: 06/20/2018
DRILLING COMPANY: M&W DRILLING		DRILLING METHODS: SONIC



TOP OF CASING ELEVATION: 393.71 FT MSL

PROTECTIVE CASING (yes) / no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 391.12 FT MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 6.0

CONCRETE SEAL DEPTH (FT. BGS): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: NONE

TOP OF BENTONITE SEAL DEPTH (FT.BGS): 2.0

AMOUNT OF 3/8 in. BENTONITE CHIPS: 2 - 5 GALLON BUCKETS

TOP OF SAND PACK DEPTH (FT.BGS): 18.0

CENTRALIZER (yes / (no) - TYPE: NONE

TOP OF SCREEN DEPTH (FT.BGS): 21.3

TYPE OF SCREEN: 2 in. X 9.8 FT SCHEDULE 40 PVC

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: COARSE: #1: 20/40

AMOUNT OF SAND: 6 BAGS

BOTTOM OF SCREEN DEPTH (FT.BGS): 31.1

BOTTOM OF WELL DEPTH (FT.BGS): 31.6

BOTTOM OF FILTER PACK (FT.BGS): 35.0

TYPE AND AMOUNT OF BACKFILL: 2 BAGS OF BENTONITE

ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.
100 GALLONS OF H20 USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FT (2000)
MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88 WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 23, 2018.
FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

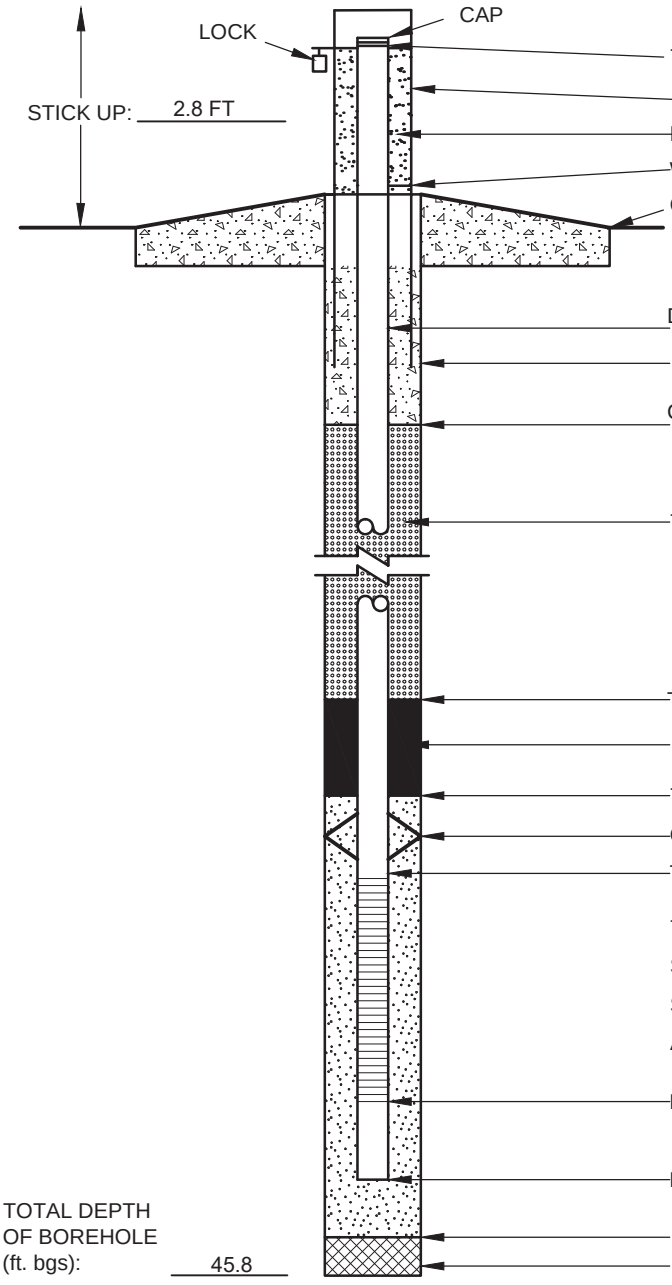
CHECKED BY: J. PEREZ
DATE CHECKED: 10/09/2018

PREPARED BY: E.SCHNEIDER

GOLDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG MW-10 (AMW-2)

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 153-1406.0004C	
SITE NAME: MERAMEC ENERGY CENTER	LOCATION: MW-10 (AMW-2)	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 402.83 FT MSL	
GEOLOGIST: R. FELDMANN	NORTHING: 934137.4	EASTING: 867158 .9
DRILLER: M. PATRICK	STATIC WATER LEVEL 23.18 FT BGS	COMPLETION DATE: 06/19/2018
DRILLING COMPANY: M&W DRILLING	DRILLING METHODS: SONIC	



TOP OF CASING ELEVATION: 405.62 FT MSL

PROTECTIVE CASING (yes) / no): 6 in. ALUMINUM

PEA GRAVEL OR SAND

WEEP HOLE

GROUND SURFACE ELEVATION: 402.83 FT MSL

DIAMETER OF RISER PIPE (in.): 2.0

DIAMETER OF BOREHOLE (in.): 6.0

CONCRETE SEAL DEPTH (ft. bgs): 2.0

TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE 4 BAGS

TOP OF BENTONITE SEAL DEPTH (FT.BGS): 27.0

AMOUNT OF 3/8 in. BENTONITE CHIPS: 1 - 5 GALLON BUCKET

TOP OF SAND PACK DEPTH (FT. BGS): 33.0

CENTRALIZER (yes (no) - TYPE: NONE

TOP OF SCREEN DEPTH (FT.BGS): 35.5

TYPE OF SCREEN: 2 in. X 9.8 FT SCHEDULE 40 PVC

SCREEN SLOT SIZE (in.): 0.010

SIZE OF SAND PACK: COARSE: #1: 20/40

AMOUNT OF SAND: 5 BAGS

BOTTOM OF SCREEN DEPTH (FT.BGS): 45.3

BOTTOM OF WELL DEPTH (FT.BGS): 45.8

BOTTOM OF FILTER PACK(FT.BGS): 45.8

TYPE AND AMOUNT OF BACKFILL: NONE

ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL.
100 GALLONS OF H20 USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FT (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88 WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 23, 2018.
FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH.

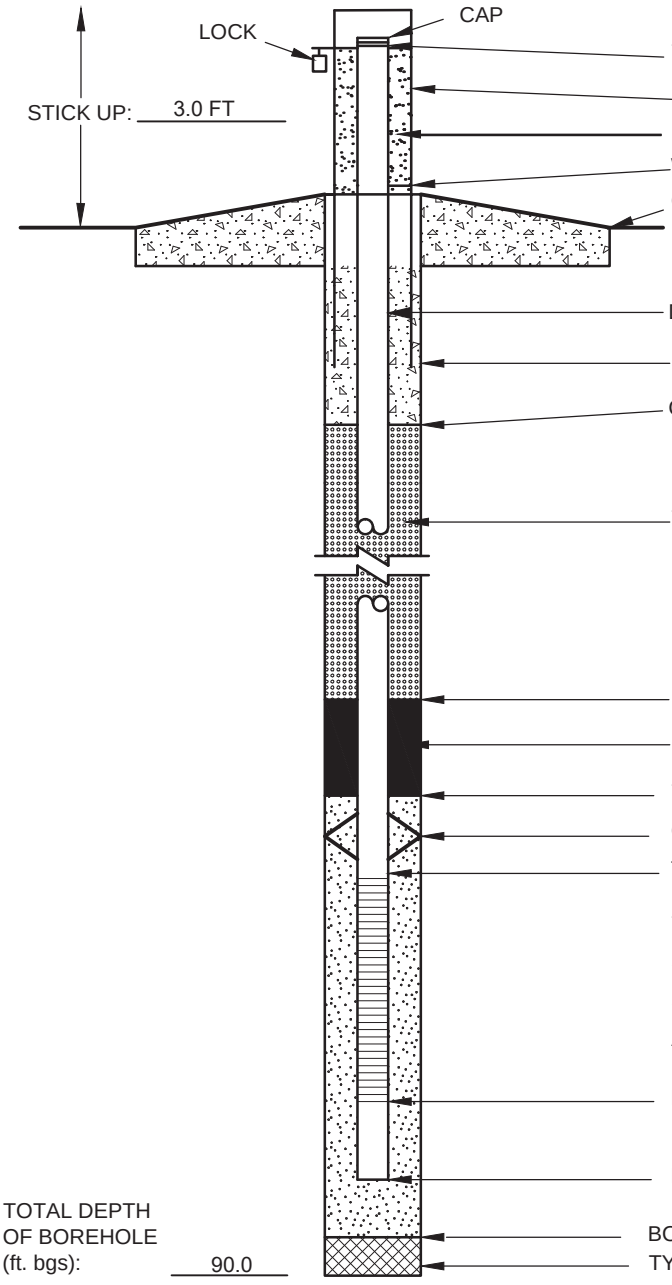
CHECKED BY: J. PEREZ
DATE CHECKED: 10/09/2018

PREPARED BY: E.SCHNEIDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG

TP-1

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 153-1406.0004C	
SITE NAME: MERAMEC ENERGY CENTER	LOCATION: TP-1	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 390.68 FT MSL	
GEOLOGIST: R. FELDMANN	NORTHING: 935109.7	EASTING: 864437.0
DRILLER: M. PATRICK	STATIC WATER LEVEL: 10.52 FT BGS	COMPLETION DATE: 06/20/2018
DRILLING COMPANY: M&W DRILLING	DRILLING METHODS: SONIC	



- TOP OF CASING ELEVATION: 393.71 FT MSL
- PROTECTIVE CASING (yes) / no): 6 in. ALUMINUM
- PEA GRAVEL OR SAND
- WEEP HOLE
- GROUND SURFACE ELEVATION: 390.68 FT MSL
- DIAMETER OF RISER PIPE (in.): 1.0
- DIAMETER OF BOREHOLE (in.): 6.0
- CONCRETE SEAL DEPTH (FT. BGS): 2.0
- TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE, 8 BAGS
- TOP OF BENTONITE SEAL DEPTH (FT. BGS): 76.0
- AMOUNT OF 3/8 in. BENTONITE CHIPS: 1 - 5 GALLON BUCKET
- TOP OF SAND PACK DEPTH (FT. BGS): 82.5
- CENTRALIZER (yes / (no) - TYPE: NONE
- TOP OF SCREEN DEPTH (FT. BGS): 84.6
- TYPE OF SCREEN: 1 in X 4.7 FT SCHEDULE 40 PVC
- SCREEN SLOT SIZE (in.): 0.010
- SIZE OF SAND PACK: COARSE: #1: 20/40
- AMOUNT OF SAND: 3 BAGS
- BOTTOM OF SCREEN DEPTH (FT. BGS): 89.3
- BOTTOM OF WELL DEPTH (FT. BGS): 89.7
- BOTTOM OF FILTER PACK (FT.BGS): 89.7
- TYPE AND AMOUNT OF BACKFILL: 0.3 FT NATURAL CAVE-IN

ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL. 280 GALLONS OF H20 USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FT (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88 WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 23, 2018. FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH. in.=INCHES.

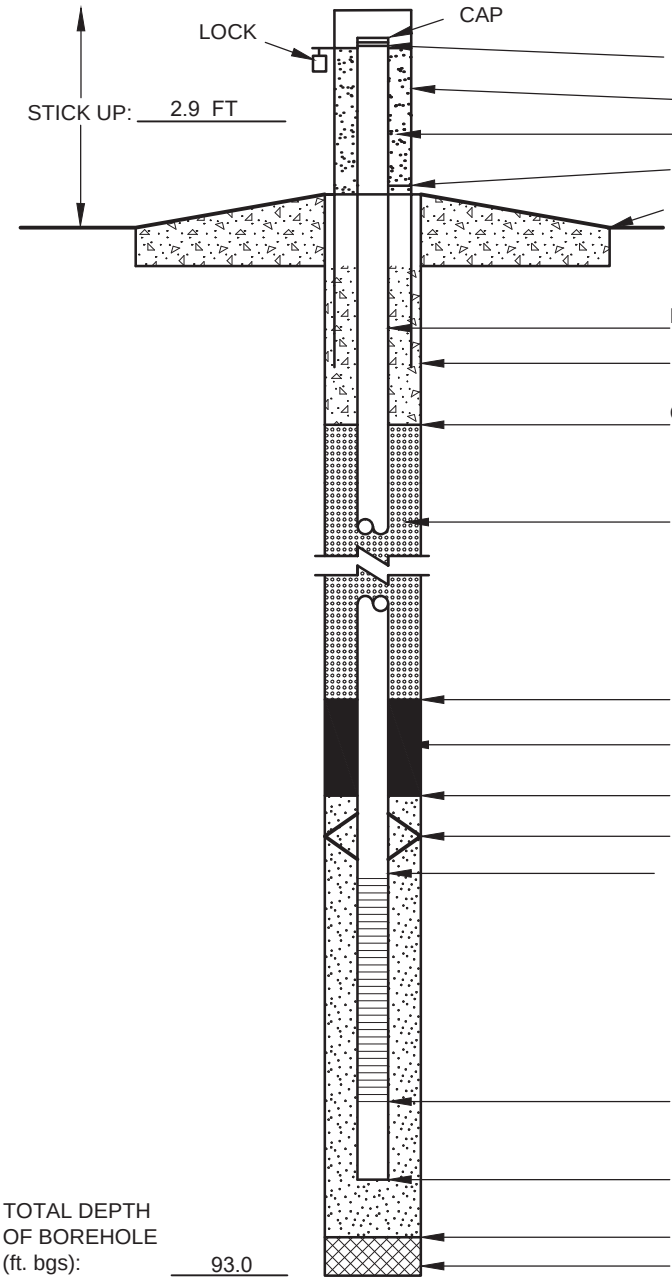
CHECKED BY: J. PEREZ
DATE CHECKED: 10/09/2018

PREPARED BY: E. SCHNEIDER

ABOVE GROUND MONITORING WELL CONSTRUCTION LOG

TP-2

PROJECT NAME: AMEREN NATURE AND EXTENT	PROJECT NUMBER: 153-1406.0004C	
SITE NAME: MERAMEC ENERGY CENTER	LOCATION: TP-2	
CLIENT: AMEREN MISSOURI	SURFACE ELEVATION: 402.35 FT MSL	
GEOLOGIST: R. FELDMANN	NORTHING: 934151.5	EASTING: 867171.1
DRILLER: M. PATRICK	STATIC WATER LEVEL: 22.66 FT BGS	COMPLETION DATE: 06/18/2018
DRILLING COMPANY: M&W DRILLING	DRILLING METHODS: SONIC	



- TOP OF CASING ELEVATION: 405.22 FT MSL
- PROTECTIVE CASING (yes) / no): 6 in. ALUMINUM
- PEA GRAVEL OR SAND
- WEEP HOLE
- GROUND SURFACE ELEVATION: 402.35 FT MSL
- DIAMETER OF RISER PIPE (in.): 1.0
- DIAMETER OF BOREHOLE (in.): 6.0
- CONCRETE SEAL DEPTH (FT. BGS): 2.0
- TYPE AND AMOUNT OF ANNULAR SEAL: HIGH SOLIDS BENTONITE, 8 BAGS
- TOP OF BENTONITE SEAL DEPTH (FT. BGS): 78.0
- AMOUNT OF 3/8 in. BENTONITE CHIPS: 1 - 5 GALLON BUCKET
- TOP OF SAND PACK DEPTH (FT. BGS): 83.5
- CENTRALIZER (yes / (no)) - TYPE: NONE
- TOP OF SCREEN DEPTH (FT. BGS): 85.5
- TYPE OF SCREEN: 1 in X 4.7 FT SCHEDULE 40 PVC
- SCREEN SLOT SIZE (in.): 0.010
- SIZE OF SAND PACK: COARSE: #1: 20/40
- AMOUNT OF SAND: 3 BAGS
- BOTTOM OF SCREEN DEPTH (FT. BGS): 90.2
- BOTTOM OF WELL DEPTH (FT. BGS): 90.6
- BOTTOM OF FILTER PACK (FT.BGS): 90.6
- TYPE AND AMOUNT OF BACKFILL: 2.4 FT OF SAND

ADDITIONAL NOTES: FT BGS = FEET BELOW GROUND SURFACE. FT MSL = FEET ABOVE MEAN SEA LEVEL. 275 GALLONS OF H20 USED DURING DRILLING. HORIZONTAL DATUM: STATE PLANE COORDINATES NAD83 US SURVEY FT (2000) MISSOURI EAST ZONE. VERTICAL DATUM: NAVD88 WELL SURVEYED BY ZAHNER AND ASSOCIATES, INC ON JULY 23, 2018. FT BTOC = FEET BELOW TOP OF CASING. SAND AND BENTONITE BAGS WEIGH 50 LBS EACH. in.=INCHES. in.=INCHES.

CHECKED BY: J. PEREZ
DATE CHECKED: 10/09/2018

PREPARED BY: E. SCHNEIDER

APPENDIX B

Laboratory Analytical Data

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

January 11, 2018

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

RE: Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on January 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

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

CERTIFICATIONS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

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

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

SAMPLE SUMMARY

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60261416001	**M-MW-1**	Water	01/03/18 10:15	01/04/18 04:45
60261416002	**M-MW-2**	Water	01/02/18 15:11	01/04/18 04:45
60261416003	**M-MW-3**	Water	01/02/18 16:28	01/04/18 04:45
60261416004	**M-MW-4**	Water	01/03/18 09:10	01/04/18 04:45
60261416005	**M-MW-5**	Water	01/03/18 10:15	01/04/18 04:45
60261416006	**M-MW-6**	Water	01/03/18 12:00	01/04/18 04:45
60261416007	**M-MW-7**	Water	01/03/18 13:40	01/04/18 04:45
60261416008	**M-MW-8**	Water	01/03/18 12:40	01/04/18 04:45
60261416009	**M-DUP-1**	Water	01/03/18 08:00	01/04/18 04:45
60261416010	**M-FB-1**	Water	01/03/18 13:25	01/04/18 04:45

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

SAMPLE ANALYTE COUNT

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60261416001	**M-MW-1**	EPA 200.7	JGP	1	PASI-K
60261416002	**M-MW-2**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261416003	**M-MW-3**	EPA 200.7	JGP	2	PASI-K
		EPA 300.0	OL	1	PASI-K
60261416004	**M-MW-4**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261416005	**M-MW-5**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261416006	**M-MW-6**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261416007	**M-MW-7**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	2	PASI-K
60261416008	**M-MW-8**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	1	PASI-K
60261416009	**M-DUP-1**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60261416010	**M-FB-1**	EPA 200.7	JGP	2	PASI-K
		SM 2540C	HMM	1	PASI-K
		EPA 300.0	OL	3	PASI-K

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

ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-1 **Lab ID: 60261416001** Collected: 01/03/18 10:15 Received: 01/04/18 04:45 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								
Calcium	**143000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:18	7440-70-2	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-2 **Lab ID: 60261416002** Collected: 01/02/18 15:11 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**6950**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 14:22	7440-42-8	
Calcium	**129000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:22	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**779**	mg/L	5.0	5.0	1		01/08/18 14:15		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**29.5**	mg/L	2.0	1.0	2		01/07/18 12:26	16887-00-6	M1
Fluoride	**0.15J**	mg/L	0.20	0.10	1		01/06/18 14:47	16984-48-8	
Sulfate	**356**	mg/L	50.0	25.0	50		01/07/18 12:54	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-3 **Lab ID: 60261416003** Collected: 01/02/18 16:28 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**8020**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 14:33	7440-42-8	
Calcium	**158000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:33	7440-70-2	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**391**	mg/L	50.0	25.0	50		01/06/18 15:16	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-4 **Lab ID: 60261416004** Collected: 01/03/18 09:10 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**8780**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 14:36	7440-42-8	
Calcium	**184000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:36	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**980**	mg/L	5.0	5.0	1		01/08/18 14:17		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**453**	mg/L	50.0	25.0	50		01/06/18 15:30	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-5 **Lab ID: 60261416005** Collected: 01/03/18 10:15 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**8810**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 14:40	7440-42-8	
Calcium	**176000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:40	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1010**	mg/L	5.0	5.0	1		01/08/18 14:18		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**428**	mg/L	50.0	25.0	50		01/06/18 15:44	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-6 **Lab ID: 60261416006** Collected: 01/03/18 12:00 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**6450**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 14:44	7440-42-8	
Calcium	**376000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 14:44	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1350**	mg/L	5.0	5.0	1		01/08/18 14:19		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**599**	mg/L	50.0	25.0	50		01/06/18 16:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-7 **Lab ID: 60261416007** Collected: 01/03/18 13:40 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**25000**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 15:11	7440-42-8	
Calcium	**435000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 15:11	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1870**	mg/L	5.0	5.0	1		01/08/18 14:20		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.35**	mg/L	0.20	0.10	1		01/06/18 16:41	16984-48-8	
Sulfate	**921**	mg/L	100	50.0	100		01/07/18 13:23	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-MW-8 **Lab ID: 60261416008** Collected: 01/03/18 12:40 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**9360**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 15:15	7440-42-8	
Calcium	**185000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 15:15	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**919**	mg/L	5.0	5.0	1		01/08/18 14:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Sulfate	**489**	mg/L	50.0	25.0	50		01/06/18 16:55	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-DUP-1 **Lab ID: 60261416009** Collected: 01/03/18 08:00 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**9700**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 15:18	7440-42-8	
Calcium	**191000**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 15:18	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**997**	mg/L	5.0	5.0	1		01/08/18 14:22		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**41.8**	mg/L	5.0	2.5	5		01/07/18 13:37	16887-00-6	
Fluoride	**0.26**	mg/L	0.20	0.10	1		01/06/18 17:09	16984-48-8	
Sulfate	**433**	mg/L	50.0	25.0	50		01/07/18 14:19	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Sample: M-FB-1 **Lab ID: 60261416010** Collected: 01/03/18 13:25 Received: 01/04/18 04:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Boron	**7.4J**	ug/L	100	3.5	1	01/05/18 14:08	01/10/18 15:07	7440-42-8	
Calcium	**<36.0**	ug/L	100	36.0	1	01/05/18 14:08	01/10/18 15:07	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**9.5**	mg/L	5.0	5.0	1		01/08/18 14:24		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.50**	mg/L	1.0	0.50	1		01/06/18 17:23	16887-00-6	
Fluoride	**<0.10**	mg/L	0.20	0.10	1		01/06/18 17:23	16984-48-8	
Sulfate	**<0.50**	mg/L	1.0	0.50	1		01/06/18 17:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

QC Batch: 509717 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60261416001, 60261416002, 60261416003, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

METHOD BLANK: 2087436 Matrix: Water
Associated Lab Samples: 60261416001, 60261416002, 60261416003, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<3.5	100	3.5	01/10/18 14:11	
Calcium	ug/L	44.4J	100	36.0	01/10/18 14:11	

LABORATORY CONTROL SAMPLE: 2087437

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1070	107	85-115	
Calcium	ug/L	10000	11100	111	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2087438 2087439

Parameter	Units	60261416002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6950	1000	1000	8150	8200	120	125	70-130	1	20	
Calcium	ug/L	129000	10000	10000	141000	142000	119	126	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

QC Batch: 509831 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60261416002, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

METHOD BLANK: 2088142 Matrix: Water
Associated Lab Samples: 60261416002, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/08/18 14:09	

LABORATORY CONTROL SAMPLE: 2088143

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

SAMPLE DUPLICATE: 2088144

Parameter	Units	60261337001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	320	315	2	10	

SAMPLE DUPLICATE: 2088145

Parameter	Units	60261416002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	779	805	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

QC Batch: 509782 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261416002, 60261416003, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

METHOD BLANK: 2087801 Matrix: Water
Associated Lab Samples: 60261416002, 60261416003, 60261416004, 60261416005, 60261416006, 60261416007, 60261416008, 60261416009, 60261416010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/06/18 10:09	
Fluoride	mg/L	<0.10	0.20	0.10	01/06/18 10:09	
Sulfate	mg/L	<0.50	1.0	0.50	01/06/18 10:09	

LABORATORY CONTROL SAMPLE: 2087802

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	2.5	101	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2087803 2087804

Parameter	Units	60261393001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	528	250	250	797	801	108	109	80-120	1	15	
Fluoride	mg/L	3.2	2.5	2.5	6.2	6.2	120	120	80-120	0	15	
Sulfate	mg/L	632	250	250	888	893	102	104	80-120	1	15	

MATRIX SPIKE SAMPLE: 2087805

Parameter	Units	60261416002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.15J	2.5	3.0	114	80-120	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

QC Batch: 509787 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60261416002, 60261416007, 60261416009

METHOD BLANK: 2088043 Matrix: Water
Associated Lab Samples: 60261416002, 60261416007, 60261416009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.50	1.0	0.50	01/07/18 09:21	
Sulfate	mg/L	<0.50	1.0	0.50	01/07/18 09:21	

LABORATORY CONTROL SAMPLE: 2088044

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Sulfate	mg/L	5	5.3	106	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2088045 2088046

Parameter	Units	60261495004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	161	50	50	211	215	100	108	80-120	2	15	E
Sulfate	mg/L	85.2	50	50	135	139	99	108	80-120	3	15	

MATRIX SPIKE SAMPLE: 2088047

Parameter	Units	60261416002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	29.5	10	42.7	133	80-120	E,M1
Sulfate	mg/L	356	250	659	121	80-120	M1

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QUALIFIERS

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

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

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MERAMEC ENERGY CENTER
Pace Project No.: 60261416

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60261416001	**M-MW-1**	EPA 200.7	509717	EPA 200.7	509826
60261416002	**M-MW-2**	EPA 200.7	509717	EPA 200.7	509826
60261416003	**M-MW-3**	EPA 200.7	509717	EPA 200.7	509826
60261416004	**M-MW-4**	EPA 200.7	509717	EPA 200.7	509826
60261416005	**M-MW-5**	EPA 200.7	509717	EPA 200.7	509826
60261416006	**M-MW-6**	EPA 200.7	509717	EPA 200.7	509826
60261416007	**M-MW-7**	EPA 200.7	509717	EPA 200.7	509826
60261416008	**M-MW-8**	EPA 200.7	509717	EPA 200.7	509826
60261416009	**M-DUP-1**	EPA 200.7	509717	EPA 200.7	509826
60261416010	**M-FB-1**	EPA 200.7	509717	EPA 200.7	509826
60261416002	**M-MW-2**	SM 2540C	509831		
60261416004	**M-MW-4**	SM 2540C	509831		
60261416005	**M-MW-5**	SM 2540C	509831		
60261416006	**M-MW-6**	SM 2540C	509831		
60261416007	**M-MW-7**	SM 2540C	509831		
60261416008	**M-MW-8**	SM 2540C	509831		
60261416009	**M-DUP-1**	SM 2540C	509831		
60261416010	**M-FB-1**	SM 2540C	509831		
60261416002	**M-MW-2**	EPA 300.0	509782		
60261416002	**M-MW-2**	EPA 300.0	509787		
60261416003	**M-MW-3**	EPA 300.0	509782		
60261416004	**M-MW-4**	EPA 300.0	509782		
60261416005	**M-MW-5**	EPA 300.0	509782		
60261416006	**M-MW-6**	EPA 300.0	509782		
60261416007	**M-MW-7**	EPA 300.0	509782		
60261416007	**M-MW-7**	EPA 300.0	509787		
60261416008	**M-MW-8**	EPA 300.0	509782		
60261416009	**M-DUP-1**	EPA 300.0	509782		
60261416009	**M-DUP-1**	EPA 300.0	509787		
60261416010	**M-FB-1**	EPA 300.0	509782		

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Sample Condition Upon Receipt

WO# : 60261416

60261416

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

Cooler Temperature (°C): **As-read** 2-8 **Corr. Factor** (CF 0.0 / CF +0.2) **Corrected** 2.8

Date and initials of person examining contents: PW 1/4/18

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jami Check 1/4/18

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.

Pace Analytical™ www.pacelabs.com

Page: 1 of 1

Section A Required Client Information:

Company:	Golder Associates
Address:	820 South Main Street, Suite 100
	St Charles, MO 63301
Email To:	maddock@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	5 Day Standard TAT

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
	Ryan_Feldmann@golder.com
Purchase Order No.:	
Project Name:	Ameren Meramec Energy Center
Project Number:	153-1406.0004B

Section C Invoice Information:

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

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N		
1	M-MW-1	WT	G			1-3-18	1015		2	1		1								1							60266416 BP3N 20 BP2U A1
2	M-MW-2	WT	G			1-2-18	1511												1	1				1		3BP3N 20 3BP2U	A2
3	M-MW-2-MS	WT	G																1	1	1	1	1	1			-
4	M-MW-2-MSD	WT	G																1	1	1	1	1	1			-
5	M-MW-3	WT	G				1620												1	1			1				A3
6	M-MW-4	WT	G			1-3-18	0910												1	1			1	1			A4
7	M-MW-5	WT	G				1015												1	1							A5
8	M-MW-6	WT	G				1200												1	1							A6
9	M-MW-7	WT	G				1340												1	1		1					A7
10	M-MW-8	WT	G				1240												1	1			1	1			A8
11	M-DUP-1	WT	G																1	1	1	1	1	1			A9
12	M-FB-1	WT	G				1325		1	1		1							1	1	1	1	1	1			A10

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Confirm Analysis w/ Jeff Ingram	Golder	1-3-18	1525	PACE	1/3/18	1525				
	PACE	1/3/18	1700	ASC	1/4/18	0445	2-8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ryan Feldmann

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 01/03/18

*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

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, MERAMEC ENERGY CENTER– AMEREN GROUNDWATER – DATA PACKAGE 60261416

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

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

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Manager: J Ingram
Project Name: Ameren-Meramec-2018 January Verification
Project Number: 1531406.0004B
Reviewer: T Goodwin
Validation Date: 1/15/18

Laboratory: Pace Analytical
SDG #: 60261416010
Analytical Method (type and no.): 200.7 Metals, 2540C TDS, 300.0 Anions
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐
Sample Names M-MW-1, M-MW-2, M-MW-3, M-MW-4, M-MW-5, M-MW-6, M-MW7, M-MW-8, M-DUP-1, M-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?	☒	☐	☐	
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☑	☐	☐	Ca (44.4)
b) Were analytes detected in the field blank(s)?	☑	☐	☐	B (7.4)
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ MW-5
	☒	☐	☐	FB-1@ MW-7
b) Were field dup. precision criteria met (note RPD)?	☑	☐	☐	
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☑	☐	133/120 Chloride, 121/120 Sulfate
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☑	☑	☐	
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☑	☐	☐	

Comments/Notes:

DUP-1 ~~was~~ (or) was run on a wider range of analytes than than M-MW-5. As such, extra analytes (Chloride & Fluoride) were not validated.

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
M-MW-2	Fluoride	0.15	J	Result is between PQL + MDL
"	Chloride	29.5	D	Result had a dilution factor of 2
"	Sulfate	356	D	50
M-MW-3	"	391	D	50
M-MW-4	"	453	D	50
M-MW-5	"	428	D	50
M-MW-6	"	599	D	50
M-MW-7	"	921	D	100
M-MW-8	"	489	D	50
M-DUP-1	"	433	D	50
"	Chloride	41.8	D	5
M-FB-1	Boron	7.4	J	MDL < Result < PQL

Signature: Tommy Johnson Jr. Date: 1/15/2018

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

May 02, 2018

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

RE: Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on April 06, 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

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

CERTIFICATIONS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

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

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

SAMPLE SUMMARY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60267676001	**M-MW-1**	Water	04/04/18 11:40	04/06/18 03:25
60267676002	**M-MW-2**	Water	04/04/18 09:10	04/06/18 03:25
60267676003	**M-MW-3**	Water	04/04/18 12:35	04/06/18 03:25
60267676004	**M-MW-4**	Water	04/04/18 16:05	04/06/18 03:25
60267676005	**M-MW-5**	Water	04/05/18 09:00	04/06/18 03:25
60267676006	**M-MW-6**	Water	04/03/18 13:55	04/06/18 03:25
60267676007	**M-MW-7**	Water	04/03/18 13:40	04/06/18 03:25
60267676008	**M-MW-8**	Water	04/05/18 08:35	04/06/18 03:25
60267676009	**M-BMW-1**	Water	04/04/18 15:25	04/06/18 03:25
60267676010	**M-BMW-2**	Water	04/04/18 14:15	04/06/18 03:25
60267676011	**M-DUP-1**	Water	04/03/18 08:00	04/06/18 03:25
60267676012	**M-FB-1**	Water	04/04/18 11:40	04/06/18 03:25
60267676013	**M-MW-3 MS**	Water	04/04/18 12:35	04/06/18 03:25
60267676014	**M-MW-3 MSD**	Water	04/04/18 12:35	04/06/18 03:25

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60267676001	M-MW-1	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676002	M-MW-2	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676003	M-MW-3	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	SMW	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676004	M-MW-4	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676005	M-MW-5	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676006	M-MW-6	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676007	**M-MW-7**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676008	**M-MW-8**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676009	**M-BMW-1**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676010	**M-BMW-2**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676011	**M-DUP-1**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO, LDB	3	PASI-K
60267676012	**M-FB-1**	EPA 200.7	JGP	12	PASI-K
		EPA 200.8	SMW	6	PASI-K
		EPA 7470	JRS	1	PASI-K
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	MJK	1	PASI-K
		EPA 300.0	AGO	3	PASI-K
60267676013	**M-MW-3 MS**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60267676014	**M-MW-3 MSD**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-1 **Lab ID: 60267676001** Collected: 04/04/18 11:40 Received: 04/06/18 03:25 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	**359**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:06	7440-39-3	
Beryllium	**0.17J**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:06	7440-41-7	
Calcium	**134000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:06	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:06	7440-48-4	
Iron	**15000**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:06	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:06	7439-92-1	
Lithium	**7.1J**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:06	7439-93-2	
Magnesium	**46300**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:06	7439-95-4	
Manganese	**1960**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:06	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:06	7439-98-7	
Potassium	**1540**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:06	7440-09-7	
Sodium	**28000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.028J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 21:57	7440-36-0	
Arsenic	**0.71J**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 21:57	7440-38-2	
Cadmium	**0.22J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 21:57	7440-43-9	
Chromium	**0.74J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 21:57	7440-47-3	
Selenium	**0.10J**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 21:57	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 21:57	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:02	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**418**	mg/L	20.0	4.9	1		04/10/18 11:30		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**42.9**	mg/L	10.0	4.6	10		04/12/18 16:01	16887-00-6	
Fluoride	**0.069J**	mg/L	0.20	0.063	1		04/13/18 08:27	16984-48-8	
Sulfate	**107**	mg/L	10.0	2.4	10		04/12/18 16:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-2 **Lab ID: 60267676002** Collected: 04/04/18 09:10 Received: 04/06/18 03:25 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	**324**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:09	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:09	7440-41-7	
Calcium	**121000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:09	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:09	7440-48-4	
Iron	**50100**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:09	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:09	7439-92-1	
Lithium	**8.2J**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:09	7439-93-2	
Magnesium	**42000**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:09	7439-95-4	
Manganese	**6180**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:09	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:09	7439-98-7	
Potassium	**2370**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:09	7440-09-7	
Sodium	**44100**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:09	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.16J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:00	7440-36-0	
Arsenic	**1.8**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:00	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:00	7440-43-9	
Chromium	**0.16J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:00	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:00	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:00	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:04	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**276**	mg/L	20.0	4.9	1		04/10/18 11:35		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**32.4**	mg/L	2.0	0.92	2		04/12/18 16:32	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/12/18 16:16	16984-48-8	
Sulfate	**297**	mg/L	50.0	11.8	50		04/12/18 16:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-3 **Lab ID: 60267676003** Collected: 04/04/18 12:35 Received: 04/06/18 03:25 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	**253**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:12	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:12	7440-41-7	
Calcium	**155000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:12	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:12	7440-48-4	
Iron	**39600**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:12	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:12	7439-92-1	
Lithium	**9.0J**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:12	7439-93-2	
Magnesium	**49000**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:12	7439-95-4	
Manganese	**2970**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:12	7439-96-5	
Molybdenum	**2.6J**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:12	7439-98-7	
Potassium	**3670**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:12	7440-09-7	
Sodium	**41000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:12	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:04	7440-36-0	
Arsenic	**8.1**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:04	7440-38-2	
Cadmium	**0.11J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:04	7440-43-9	
Chromium	**0.34J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:04	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:04	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/16/18 11:24	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**272**	mg/L	20.0	4.9	1		04/10/18 11:40		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**37.8**	mg/L	5.0	2.3	5		04/12/18 18:19	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/12/18 19:06	16984-48-8	
Sulfate	**361**	mg/L	50.0	11.8	50		04/12/18 17:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-4 **Lab ID: 60267676004** Collected: 04/04/18 16:05 Received: 04/06/18 03:25 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	**214**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:20	7440-39-3	
Beryllium	**0.28J**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:20	7440-41-7	
Calcium	**191000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:20	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:20	7440-48-4	
Iron	**27700**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:20	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:20	7439-92-1	
Lithium	**27.0**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:20	7439-93-2	
Magnesium	**55600**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:20	7439-95-4	
Manganese	**824**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:20	7439-96-5	
Molybdenum	**55.0**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:20	7439-98-7	
Potassium	**6170**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:20	7440-09-7	
Sodium	**48000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:20	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.027J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:14	7440-36-0	
Arsenic	**14.4**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:14	7440-38-2	
Cadmium	**0.16J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:14	7440-43-9	
Chromium	**0.33J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:14	7440-47-3	
Selenium	**0.12J**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:14	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:14	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:13	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**266**	mg/L	20.0	4.9	1		04/10/18 11:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**51.0**	mg/L	5.0	2.3	5		04/12/18 20:07	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/12/18 19:52	16984-48-8	
Sulfate	**461**	mg/L	50.0	11.8	50		04/12/18 20:23	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-5 **Lab ID: 60267676005** Collected: 04/05/18 09:00 Received: 04/06/18 03:25 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	**245**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:22	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:22	7440-41-7	
Calcium	**173000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:22	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:22	7440-48-4	
Iron	**16900**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:22	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:22	7439-92-1	
Lithium	**26.2**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:22	7439-93-2	
Magnesium	**59700**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:22	7439-95-4	
Manganese	**459**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:22	7439-96-5	
Molybdenum	**98.3**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:22	7439-98-7	
Potassium	**5220**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:22	7440-09-7	
Sodium	**44700**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:22	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:17	7440-36-0	
Arsenic	**22.1**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:17	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:17	7440-43-9	
Chromium	**0.22J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:17	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:17	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:17	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:15	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**343**	mg/L	20.0	4.9	1		04/11/18 15:07		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**41.6**	mg/L	5.0	2.3	5		04/12/18 21:24	16887-00-6	
Fluoride	**0.10J**	mg/L	0.20	0.063	1		04/12/18 21:09	16984-48-8	
Sulfate	**349**	mg/L	50.0	11.8	50		04/12/18 21:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-6 **Lab ID: 60267676006** Collected: 04/03/18 13:55 Received: 04/06/18 03:25 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	**53.8**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:25	7440-39-3	
Beryllium	**0.36J**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:25	7440-41-7	
Calcium	**368000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:25	7440-70-2	
Cobalt	**4.1J**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:25	7440-48-4	
Iron	**13600**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:25	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:25	7439-92-1	
Lithium	**144**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:25	7439-93-2	
Magnesium	**29700**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:25	7439-95-4	
Manganese	**1140**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:25	7439-96-5	
Molybdenum	**134**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:25	7439-98-7	
Potassium	**13500**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:25	7440-09-7	
Sodium	**22200**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:25	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.043J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:20	7440-36-0	
Arsenic	**4.9**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:20	7440-38-2	
Cadmium	**0.069J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:20	7440-43-9	
Chromium	**2.4**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:20	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:20	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:20	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:18	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**470**	mg/L	20.0	4.9	1		04/10/18 10:57		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.4**	mg/L	1.0	0.46	1		04/12/18 21:55	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.063	1		04/12/18 21:55	16984-48-8	
Sulfate	**738**	mg/L	50.0	11.8	50		04/12/18 22:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-7 **Lab ID: 60267676007** Collected: 04/03/18 13:40 Received: 04/06/18 03:25 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	**41.8**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:33	7440-39-3	
Beryllium	**0.35J**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:33	7440-41-7	
Calcium	**396000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:33	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:33	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:33	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:33	7439-92-1	
Lithium	**62.0**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:33	7439-93-2	
Magnesium	**29800**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:33	7439-95-4	
Manganese	**4.4J**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:33	7439-96-5	
Molybdenum	**502**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:33	7439-98-7	
Potassium	**19000**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:33	7440-09-7	
Sodium	**105000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:33	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.42J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:31	7440-36-0	
Arsenic	**3.2**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:31	7440-38-2	
Cadmium	**0.22J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:31	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:31	7440-47-3	
Selenium	**0.45J**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:31	7782-49-2	
Thallium	**0.12J**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:31	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:20	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**145**	mg/L	20.0	4.9	1		04/10/18 11:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**61.1**	mg/L	10.0	4.6	10		04/12/18 22:41	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.063	1		04/12/18 22:26	16984-48-8	
Sulfate	**1130**	mg/L	100	23.6	100		04/12/18 22:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-8 **Lab ID: 60267676008** Collected: 04/05/18 08:35 Received: 04/06/18 03:25 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	**199**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:36	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:36	7440-41-7	
Calcium	**178000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:36	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:36	7440-48-4	
Iron	**10300**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:36	7439-89-6	
Lead	**3.4J**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:36	7439-92-1	
Lithium	**32.4**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:36	7439-93-2	
Magnesium	**38700**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:36	7439-95-4	
Manganese	**2110**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:36	7439-96-5	
Molybdenum	**192**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:36	7439-98-7	
Potassium	**6430**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:36	7440-09-7	
Sodium	**34200**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:36	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:34	7440-36-0	
Arsenic	**6.0**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:34	7440-38-2	
Cadmium	**0.035J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:34	7440-43-9	
Chromium	**0.20J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:34	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:34	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:34	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:22	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**199**	mg/L	20.0	4.9	1		04/11/18 15:11		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**23.6**	mg/L	2.0	0.92	2		04/13/18 00:14	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/12/18 23:12	16984-48-8	
Sulfate	**529**	mg/L	50.0	11.8	50		04/12/18 23:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-BMW-1 **Lab ID: 60267676009** Collected: 04/04/18 15:25 Received: 04/06/18 03:25 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	**237**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:39	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:39	7440-41-7	
Calcium	**120000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:39	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:39	7440-48-4	
Iron	**471**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:39	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:39	7439-92-1	
Lithium	**13.8**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:39	7439-93-2	
Magnesium	**31500**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:39	7439-95-4	
Manganese	**173**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:39	7439-96-5	
Molybdenum	**4.3J**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:39	7439-98-7	
Potassium	**3190**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:39	7440-09-7	
Sodium	**111000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:39	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.51J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:37	7440-36-0	
Arsenic	**1.9**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:37	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:37	7440-43-9	
Chromium	**0.11J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:37	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:37	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:37	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:29	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**383**	mg/L	20.0	4.9	1		04/10/18 12:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**136**	mg/L	20.0	9.2	20		04/13/18 00:45	16887-00-6	
Fluoride	**0.18J**	mg/L	0.20	0.063	1		04/13/18 00:29	16984-48-8	
Sulfate	**110**	mg/L	20.0	4.7	20		04/13/18 00:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-BMW-2 **Lab ID: 60267676010** Collected: 04/04/18 14:15 Received: 04/06/18 03:25 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	**537**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:41	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:41	7440-41-7	
Calcium	**105000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:41	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:41	7440-48-4	
Iron	**14900**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:41	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:41	7439-92-1	
Lithium	**9.3J**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:41	7439-93-2	
Magnesium	**37600**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:41	7439-95-4	
Manganese	**4600**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:41	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:41	7439-98-7	
Potassium	**1400**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:41	7440-09-7	
Sodium	**19300**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:41	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:41	7440-36-0	
Arsenic	**1.1**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:41	7440-38-2	
Cadmium	**0.31J**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:41	7440-43-9	
Chromium	**0.45J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:41	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:41	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:41	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:31	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**425**	mg/L	20.0	4.9	1		04/10/18 12:09		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.5**	mg/L	1.0	0.46	1		04/13/18 01:00	16887-00-6	
Fluoride	**0.10J**	mg/L	0.20	0.063	1		04/13/18 01:00	16984-48-8	
Sulfate	**19.5**	mg/L	1.0	0.24	1		04/13/18 01:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-DUP-1 **Lab ID: 60267676011** Collected: 04/03/18 08:00 Received: 04/06/18 03:25 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	**45.6**	ug/L	5.0	1.5	1	04/11/18 15:04	04/12/18 16:44	7440-39-3	
Beryllium	**0.39J**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 16:44	7440-41-7	
Calcium	**390000**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 16:44	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 16:44	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 16:44	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 16:44	7439-92-1	
Lithium	**60.6**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 16:44	7439-93-2	
Magnesium	**29600**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 16:44	7439-95-4	
Manganese	**5.1**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 16:44	7439-96-5	
Molybdenum	**492**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 16:44	7439-98-7	
Potassium	**18600**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 16:44	7440-09-7	
Sodium	**103000**	ug/L	500	157	1	04/11/18 15:04	04/12/18 16:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**0.44J**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:44	7440-36-0	
Arsenic	**3.2**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:44	7440-38-2	
Cadmium	**0.58**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:44	7440-43-9	
Chromium	**0.065J**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:44	7440-47-3	
Selenium	**0.36J**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:44	7782-49-2	
Thallium	**0.11J**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:44	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:33	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**147**	mg/L	20.0	4.9	1		04/10/18 11:06		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**63.6**	mg/L	5.0	2.3	5		04/13/18 01:31	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.063	1		04/13/18 01:15	16984-48-8	
Sulfate	**1160**	mg/L	200	47.3	200		04/20/18 09:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-FB-1 **Lab ID: 60267676012** Collected: 04/04/18 11:40 Received: 04/06/18 03:25 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	04/11/18 15:04	04/12/18 17:06	7440-39-3	
Beryllium	**<0.16**	ug/L	1.0	0.16	1	04/11/18 15:04	04/12/18 17:06	7440-41-7	
Calcium	**<53.5**	ug/L	200	53.5	1	04/11/18 15:04	04/12/18 17:06	7440-70-2	
Cobalt	**<0.87**	ug/L	5.0	0.87	1	04/11/18 15:04	04/12/18 17:06	7440-48-4	
Iron	**<6.1**	ug/L	50.0	6.1	1	04/11/18 15:04	04/12/18 17:06	7439-89-6	
Lead	**<3.0**	ug/L	10.0	3.0	1	04/11/18 15:04	04/12/18 17:06	7439-92-1	
Lithium	**<4.6**	ug/L	10.0	4.6	1	04/11/18 15:04	04/12/18 17:06	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	04/11/18 15:04	04/12/18 17:06	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	04/11/18 15:04	04/12/18 17:06	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	04/11/18 15:04	04/12/18 17:06	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	04/11/18 15:04	04/12/18 17:06	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	04/11/18 15:04	04/12/18 17:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Antimony	**<0.026**	ug/L	1.0	0.026	1	04/11/18 15:04	04/26/18 22:47	7440-36-0	
Arsenic	**<0.052**	ug/L	1.0	0.052	1	04/11/18 15:04	04/26/18 22:47	7440-38-2	
Cadmium	**<0.018**	ug/L	0.50	0.018	1	04/11/18 15:04	04/26/18 22:47	7440-43-9	
Chromium	**<0.054**	ug/L	1.0	0.054	1	04/11/18 15:04	04/26/18 22:47	7440-47-3	
Selenium	**<0.086**	ug/L	1.0	0.086	1	04/11/18 15:04	04/26/18 22:47	7782-49-2	
Thallium	**<0.036**	ug/L	1.0	0.036	1	04/11/18 15:04	04/26/18 22:47	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**<0.090**	ug/L	0.20	0.090	1	04/11/18 15:50	04/12/18 14:35	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		04/11/18 15:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		04/13/18 02:02	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		04/13/18 02:02	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		04/13/18 02:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521410 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

METHOD BLANK: 2134273 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.090	0.20	0.090	04/13/18 10:26	

LABORATORY CONTROL SAMPLE: 2134274

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134275 2134276

Parameter	Units	60267676003 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	5.3	5.3	106	105	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521375 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

METHOD BLANK: 2134189 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	2.4J	5.0	1.5	04/12/18 16:01	
Beryllium	ug/L	<0.16	1.0	0.16	04/12/18 16:01	
Calcium	ug/L	<53.5	200	53.5	04/12/18 16:01	
Cobalt	ug/L	<0.87	5.0	0.87	04/12/18 16:01	
Iron	ug/L	<6.1	50.0	6.1	04/12/18 16:01	
Lead	ug/L	<3.0	10.0	3.0	04/12/18 16:01	
Lithium	ug/L	<4.6	10.0	4.6	04/12/18 16:01	
Magnesium	ug/L	<14.0	50.0	14.0	04/12/18 16:01	
Manganese	ug/L	<0.73	5.0	0.73	04/12/18 16:01	
Molybdenum	ug/L	<0.90	20.0	0.90	04/12/18 16:01	
Potassium	ug/L	<79.3	500	79.3	04/12/18 16:01	
Sodium	ug/L	<157	500	157	04/12/18 16:01	

LABORATORY CONTROL SAMPLE: 2134190

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1000	100	85-115	
Beryllium	ug/L	1000	1030	103	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Cobalt	ug/L	1000	1050	105	85-115	
Iron	ug/L	10000	9970	100	85-115	
Lead	ug/L	1000	1050	105	85-115	
Lithium	ug/L	1000	983	98	85-115	
Magnesium	ug/L	10000	10700	107	85-115	
Manganese	ug/L	1000	1040	104	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	9740	97	85-115	
Sodium	ug/L	10000	10000	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134191 2134192

Parameter	Units	60267676003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	253	2000	2000	2220	2270	98	101	70-130	3	20	
Beryllium	ug/L	<0.16	2000	2000	2000	2050	100	102	70-130	2	20	
Calcium	ug/L	155000	20000	20000	169000	171000	71	80	70-130	1	20	
Cobalt	ug/L	<0.87	2000	2000	2010	2060	100	103	70-130	3	20	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134191 2134192

Parameter	Units	60267676003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	39600	20000	20000	57300	58000	88	92	70-130	1	20	
Lead	ug/L	<3.0	2000	2000	2000	2050	100	102	70-130	3	20	
Lithium	ug/L	9.0J	2000	2000	1970	2020	98	100	70-130	2	20	
Magnesium	ug/L	49000	20000	20000	68500	69600	98	103	70-130	2	20	
Manganese	ug/L	2970	2000	2000	4870	4940	95	99	70-130	2	20	
Molybdenum	ug/L	2.6J	2000	2000	2020	2070	101	103	70-130	3	20	
Potassium	ug/L	3670	20000	20000	23100	23600	97	99	70-130	2	20	
Sodium	ug/L	41000	20000	20000	59800	60800	94	99	70-130	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134193 2134194

Parameter	Units	60267665001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	130	1000	1000	1120	1100	99	97	70-130	2	20	
Beryllium	ug/L	<0.16	1000	1000	1030	1020	103	102	70-130	1	20	
Calcium	ug/L	73000	10000	10000	83500	82300	104	93	70-130	1	20	
Cobalt	ug/L	<0.87	1000	1000	1030	1020	103	102	70-130	1	20	
Iron	ug/L	591	10000	10000	10300	10300	97	97	70-130	0	20	
Lead	ug/L	<3.0	1000	1000	1040	1020	104	102	70-130	1	20	
Lithium	ug/L	14.3	1000	1000	989	985	97	97	70-130	0	20	
Magnesium	ug/L	23100	10000	10000	34100	33700	110	106	70-130	1	20	
Manganese	ug/L	123	1000	1000	1160	1150	104	103	70-130	1	20	
Molybdenum	ug/L	31.4	1000	1000	1050	1040	102	101	70-130	1	20	
Potassium	ug/L	4730	10000	10000	14400	14300	97	96	70-130	1	20	
Sodium	ug/L	12400	10000	10000	22500	22200	101	98	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521376 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

METHOD BLANK: 2134196 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.026	1.0	0.026	04/26/18 21:50	
Arsenic	ug/L	<0.052	1.0	0.052	04/26/18 21:50	
Cadmium	ug/L	<0.018	0.50	0.018	04/26/18 21:50	
Chromium	ug/L	<0.054	1.0	0.054	04/26/18 21:50	
Selenium	ug/L	<0.086	1.0	0.086	04/26/18 21:50	
Thallium	ug/L	<0.036	1.0	0.036	04/26/18 21:50	

LABORATORY CONTROL SAMPLE: 2134197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	41.3	103	85-115	
Arsenic	ug/L	40	41.3	103	85-115	
Cadmium	ug/L	40	40.8	102	85-115	
Chromium	ug/L	40	41.6	104	85-115	
Selenium	ug/L	40	38.4	96	85-115	
Thallium	ug/L	40	37.4	93	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134198 2134199

Parameter	Units	60267676003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.026	40	40	41.5	40.9	104	102	70-130	2	20	
Arsenic	ug/L	8.1	40	40	49.3	48.7	103	101	70-130	1	20	
Cadmium	ug/L	0.11J	40	40	39.4	39.0	98	97	70-130	1	20	
Chromium	ug/L	0.34J	40	40	41.4	43.3	103	108	70-130	5	20	
Selenium	ug/L	<0.086	40	40	36.6	36.5	91	91	70-130	0	20	
Thallium	ug/L	<0.036	40	40	46.5	45.9	116	115	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134200 2134201

Parameter	Units	60267665001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	0.037J	40	40	41.4	41.4	103	103	70-130	0	20	
Arsenic	ug/L	1.2	40	40	41.8	42.2	102	103	70-130	1	20	
Cadmium	ug/L	0.38J	40	40	41.7	39.6	103	98	70-130	5	20	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134200 2134201

Parameter	Units	60267665001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium	ug/L	0.062J	40	40	40.8	40.6	102	101	70-130	1	20	
Selenium	ug/L	<0.086	40	40	36.4	36.8	91	92	70-130	1	20	
Thallium	ug/L	<0.036	40	40	44.5	42.8	111	107	70-130	4	20	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521111 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676006, 60267676007, 60267676009, 60267676010, 60267676011

METHOD BLANK: 2133213 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676006, 60267676007, 60267676009, 60267676010, 60267676011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	04/10/18 10:00	

LABORATORY CONTROL SAMPLE: 2133214

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	495	99	90-110	

SAMPLE DUPLICATE: 2133215

Parameter	Units	60266759004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	149	148	0	10	

SAMPLE DUPLICATE: 2133216

Parameter	Units	60267676003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	272	278	2	10	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521390 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60267676005, 60267676008, 60267676012

METHOD BLANK: 2134228 Matrix: Water
Associated Lab Samples: 60267676005, 60267676008, 60267676012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	04/11/18 14:55	

LABORATORY CONTROL SAMPLE: 2134229

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	494	99	90-110	

SAMPLE DUPLICATE: 2134230

Parameter	Units	60267665001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	226	231	2	10	

SAMPLE DUPLICATE: 2134231

Parameter	Units	60267665005 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	238	244	2	10	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521513 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

METHOD BLANK: 2134756 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	04/12/18 14:35	
Fluoride	mg/L	<0.063	0.20	0.063	04/12/18 14:35	
Sulfate	mg/L	<0.24	1.0	0.24	04/12/18 14:35	

LABORATORY CONTROL SAMPLE: 2134757

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	104	90-110	
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2134758 2134759

Parameter	Units	60267676003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	37.8	25	25	65.6	65.0	111	109	80-120	1	15	
Fluoride	mg/L	<0.063	2.5	2.5	2.6	2.9	104	116	80-120	12	15	
Sulfate	mg/L	361	250	250	610	610	99	100	80-120	0	15	

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QUALITY CONTROL DATA

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 521675 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60267676011

METHOD BLANK: 2135557 Matrix: Water
Associated Lab Samples: 60267676011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	04/19/18 11:47	

LABORATORY CONTROL SAMPLE: 2135558

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.7	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2135559 2135560

Parameter	Units	60267839005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	88.9	50	50	144	141	110	105	80-120	2	15	

MATRIX SPIKE SAMPLE: 2135561

Parameter	Units	60267881001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	64.8	250	306	96	80-120	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-1 **Lab ID: 60267676001** Collected: 04/04/18 11:40 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.416 ± 0.454 (0.714) C:NA T:92%**	pCi/L	04/27/18 10:22	13982-63-3	
Radium-228	EPA 904.0	**0.670 ± 0.386 (0.715) C:80% T:85%**	pCi/L	04/30/18 12:14	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-2 **Lab ID: 60267676002** Collected: 04/04/18 09:10 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.226 ± 0.384 (0.679) C:NA T:85%**	pCi/L	04/27/18 10:22	13982-63-3	
Radium-228	EPA 904.0	**0.511 ± 0.398 (0.789) C:78% T:78%**	pCi/L	04/30/18 12:14	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-3 **Lab ID: 60267676003** Collected: 04/04/18 12:35 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.36 ± 0.630 (0.651) C:NA T:89%**	pCi/L	04/27/18 10:22	13982-63-3	
Radium-228	EPA 904.0	**0.376 ± 0.408 (0.854) C:73% T:85%**	pCi/L	04/30/18 15:35	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-4 **Lab ID: 60267676004** Collected: 04/04/18 16:05 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.266 ± 0.377 (0.639) C:NA T:89%**	pCi/L	04/27/18 10:46	13982-63-3	
Radium-228	EPA 904.0	**0.275 ± 0.358 (0.764) C:77% T:86%**	pCi/L	04/30/18 15:35	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-5 **Lab ID: 60267676005** Collected: 04/05/18 09:00 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.883 ± 0.519 (0.624) C:NA T:93%**	pCi/L	04/27/18 10:43	13982-63-3	
Radium-228	EPA 904.0	**0.498 ± 0.399 (0.796) C:79% T:83%**	pCi/L	04/30/18 15:35	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-6 **Lab ID: 60267676006** Collected: 04/03/18 13:55 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.400 ± 0.418 (0.655) C:NA T:92%**	pCi/L	04/27/18 10:46	13982-63-3	
Radium-228	EPA 904.0	**0.0454 ± 0.400 (0.913) C:78% T:84%**	pCi/L	04/30/18 15:35	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-7 **Lab ID: 60267676007** Collected: 04/03/18 13:40 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.330 ± 0.433 (0.721) C:NA T:85%**	pCi/L	04/27/18 10:43	13982-63-3	
Radium-228	EPA 904.0	**0.890 ± 0.422 (0.725) C:81% T:88%**	pCi/L	04/30/18 15:36	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-8 **Lab ID: 60267676008** Collected: 04/05/18 08:35 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0514 ± 0.266 (0.553) C:NA T:89%**	pCi/L	04/27/18 11:00	13982-63-3	
Radium-228	EPA 904.0	**0.933 ± 0.473 (0.834) C:76% T:78%**	pCi/L	04/30/18 15:36	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-BMW-1 **Lab ID: 60267676009** Collected: 04/04/18 15:25 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.348 ± 0.325 (0.461) C:NA T:92%**	pCi/L	04/27/18 10:46	13982-63-3	
Radium-228	EPA 904.0	**0.851 ± 0.419 (0.719) C:80% T:79%**	pCi/L	04/30/18 14:36	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-BMW-2 **Lab ID: 60267676010** Collected: 04/04/18 14:15 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.214 ± 0.333 (0.577) C:NA T:91%**	pCi/L	04/27/18 10:47	13982-63-3	
Radium-228	EPA 904.0	**0.648 ± 0.340 (0.597) C:79% T:88%**	pCi/L	04/30/18 14:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-DUP-1 **Lab ID: 60267676011** Collected: 04/03/18 08:00 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.371 ± 0.454 (0.747) C:NA T:93%**	pCi/L	04/27/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**0.446 ± 0.310 (0.590) C:77% T:86%**	pCi/L	04/30/18 14:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-FB-1 **Lab ID: 60267676012** Collected: 04/04/18 11:40 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0566 ± 0.258 (0.525) C:NA T:87%**	pCi/L	04/27/18 11:00	13982-63-3	
Radium-228	EPA 904.0	**0.122 ± 0.352 (0.790) C:77% T:78%**	pCi/L	04/30/18 14:37	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-3 MS **Lab ID: 60267676013** Collected: 04/04/18 12:35 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**89.52 %REC ± NA (NA) C:NA T:NA**	pCi/L	04/27/18 11:00	13982-63-3	
Radium-228	EPA 904.0	**117.60 %REC ± NA (NA) C:NA T:NA**	pCi/L	04/30/18 14:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Sample: M-MW-3 MSD **Lab ID: 60267676014** Collected: 04/04/18 12:35 Received: 04/06/18 03:25 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**76.31 %REC 15.93 RPD ± NA (NA) C:NA T:NA**	pCi/L	04/27/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**105.80 %REC 10.57 RPD ± NA (NA) C:NA T:NA**	pCi/L	04/30/18 14:37	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 294505 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012, 60267676013, 60267676014

METHOD BLANK: 1441733 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012, 60267676013, 60267676014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.289 ± 0.313 (0.652) C:79% T:88%	pCi/L	04/30/18 11:22	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

QC Batch: 294504 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012, 60267676013, 60267676014

METHOD BLANK: 1441732 Matrix: Water
Associated Lab Samples: 60267676001, 60267676002, 60267676003, 60267676004, 60267676005, 60267676006, 60267676007, 60267676008, 60267676009, 60267676010, 60267676011, 60267676012, 60267676013, 60267676014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.360 ± 0.409 (0.646) C:NA T:87%	pCi/L	04/27/18 10:22	

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 MEC ASSESSMENT
Pace Project No.: 60267676

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267676001	**M-MW-1**	EPA 200.7	521375	EPA 200.7	521434
60267676002	**M-MW-2**	EPA 200.7	521375	EPA 200.7	521434
60267676003	**M-MW-3**	EPA 200.7	521375	EPA 200.7	521434
60267676004	**M-MW-4**	EPA 200.7	521375	EPA 200.7	521434
60267676005	**M-MW-5**	EPA 200.7	521375	EPA 200.7	521434
60267676006	**M-MW-6**	EPA 200.7	521375	EPA 200.7	521434
60267676007	**M-MW-7**	EPA 200.7	521375	EPA 200.7	521434
60267676008	**M-MW-8**	EPA 200.7	521375	EPA 200.7	521434
60267676009	**M-BMW-1**	EPA 200.7	521375	EPA 200.7	521434
60267676010	**M-BMW-2**	EPA 200.7	521375	EPA 200.7	521434
60267676011	**M-DUP-1**	EPA 200.7	521375	EPA 200.7	521434
60267676012	**M-FB-1**	EPA 200.7	521375	EPA 200.7	521434
60267676001	**M-MW-1**	EPA 200.8	521376	EPA 200.8	521433
60267676002	**M-MW-2**	EPA 200.8	521376	EPA 200.8	521433
60267676003	**M-MW-3**	EPA 200.8	521376	EPA 200.8	521433
60267676004	**M-MW-4**	EPA 200.8	521376	EPA 200.8	521433
60267676005	**M-MW-5**	EPA 200.8	521376	EPA 200.8	521433
60267676006	**M-MW-6**	EPA 200.8	521376	EPA 200.8	521433
60267676007	**M-MW-7**	EPA 200.8	521376	EPA 200.8	521433
60267676008	**M-MW-8**	EPA 200.8	521376	EPA 200.8	521433
60267676009	**M-BMW-1**	EPA 200.8	521376	EPA 200.8	521433
60267676010	**M-BMW-2**	EPA 200.8	521376	EPA 200.8	521433
60267676011	**M-DUP-1**	EPA 200.8	521376	EPA 200.8	521433
60267676012	**M-FB-1**	EPA 200.8	521376	EPA 200.8	521433
60267676001	**M-MW-1**	EPA 7470	521410	EPA 7470	521422
60267676002	**M-MW-2**	EPA 7470	521410	EPA 7470	521422
60267676003	**M-MW-3**	EPA 7470	521410	EPA 7470	521422
60267676004	**M-MW-4**	EPA 7470	521410	EPA 7470	521422
60267676005	**M-MW-5**	EPA 7470	521410	EPA 7470	521422
60267676006	**M-MW-6**	EPA 7470	521410	EPA 7470	521422
60267676007	**M-MW-7**	EPA 7470	521410	EPA 7470	521422
60267676008	**M-MW-8**	EPA 7470	521410	EPA 7470	521422
60267676009	**M-BMW-1**	EPA 7470	521410	EPA 7470	521422
60267676010	**M-BMW-2**	EPA 7470	521410	EPA 7470	521422
60267676011	**M-DUP-1**	EPA 7470	521410	EPA 7470	521422
60267676012	**M-FB-1**	EPA 7470	521410	EPA 7470	521422
60267676001	**M-MW-1**	EPA 903.1	294504		
60267676002	**M-MW-2**	EPA 903.1	294504		
60267676003	**M-MW-3**	EPA 903.1	294504		
60267676004	**M-MW-4**	EPA 903.1	294504		
60267676005	**M-MW-5**	EPA 903.1	294504		
60267676006	**M-MW-6**	EPA 903.1	294504		
60267676007	**M-MW-7**	EPA 903.1	294504		
60267676008	**M-MW-8**	EPA 903.1	294504		
60267676009	**M-BMW-1**	EPA 903.1	294504		
60267676010	**M-BMW-2**	EPA 903.1	294504		
60267676011	**M-DUP-1**	EPA 903.1	294504		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MEC ASSESSMENT
Pace Project No.: 60267676

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60267676012	M-FB-1	EPA 903.1	294504		
60267676013	M-MW-3 MS	EPA 903.1	294504		
60267676014	M-MW-3 MSD	EPA 903.1	294504		
60267676001	M-MW-1	EPA 904.0	294505		
60267676002	M-MW-2	EPA 904.0	294505		
60267676003	M-MW-3	EPA 904.0	294505		
60267676004	M-MW-4	EPA 904.0	294505		
60267676005	M-MW-5	EPA 904.0	294505		
60267676006	M-MW-6	EPA 904.0	294505		
60267676007	M-MW-7	EPA 904.0	294505		
60267676008	M-MW-8	EPA 904.0	294505		
60267676009	M-BMW-1	EPA 904.0	294505		
60267676010	M-BMW-2	EPA 904.0	294505		
60267676011	M-DUP-1	EPA 904.0	294505		
60267676012	M-FB-1	EPA 904.0	294505		
60267676013	M-MW-3 MS	EPA 904.0	294505		
60267676014	M-MW-3 MSD	EPA 904.0	294505		
60267676001	M-MW-1	SM 2320B	521111		
60267676002	M-MW-2	SM 2320B	521111		
60267676003	M-MW-3	SM 2320B	521111		
60267676004	M-MW-4	SM 2320B	521111		
60267676005	M-MW-5	SM 2320B	521390		
60267676006	M-MW-6	SM 2320B	521111		
60267676007	M-MW-7	SM 2320B	521111		
60267676008	M-MW-8	SM 2320B	521390		
60267676009	M-BMW-1	SM 2320B	521111		
60267676010	M-BMW-2	SM 2320B	521111		
60267676011	M-DUP-1	SM 2320B	521111		
60267676012	M-FB-1	SM 2320B	521390		
60267676001	M-MW-1	EPA 300.0	521513		
60267676002	M-MW-2	EPA 300.0	521513		
60267676003	M-MW-3	EPA 300.0	521513		
60267676004	M-MW-4	EPA 300.0	521513		
60267676005	M-MW-5	EPA 300.0	521513		
60267676006	M-MW-6	EPA 300.0	521513		
60267676007	M-MW-7	EPA 300.0	521513		
60267676008	M-MW-8	EPA 300.0	521513		
60267676009	M-BMW-1	EPA 300.0	521513		
60267676010	M-BMW-2	EPA 300.0	521513		
60267676011	M-DUP-1	EPA 300.0	521513		
60267676011	M-DUP-1	EPA 300.0	521675		
60267676012	M-FB-1	EPA 300.0	521513		

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Sample Condition Upon Receipt

WO# : 60267676

60267676

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

Cooler Temperature (°C): **As-read** 12.4 13.7 **Corr. Factor** +0.2 3.6 **Corrected** 12.6 12.9 3.8

Date and initials of person examining contents: 4/6/18 AC

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jami Check 4/9/18 Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

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

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Page: 1 of 1

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
	Ryan Feldmann
Purchase Order No.:	
Project Name:	Ameren Meramec Energy Ctr Assessment
Project Number:	

Section C Invoice Information:

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

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals* + Hg	Fluoride/Chloride/Sulfate	Radium 226	Radium 228	Alkalinity						Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																			N	N	N	N	N						60267676
1	M-MW-1	WT	G			4-4-18	1140		4	1		3							1	1	1	1	1	28PIN	BP2U	BP3N			001
2	M-MW-2	WT	G			4-4-18	0910		1	1		1							1	1	1	1	1						002
3	M-MW-3	WT	G			4-4-18	1235		12	3		9							3	3	3	3	3						003
4	M-MW-4	WT	G			4-4-18	1605		4	1		3							1	1	1	1	1						004
5	M-MW-5	WT	G			4-5-18	0900		1	1		1							1	1	1	1	1						005
6	M-MW-6	WT	G			4-3-18	1355																						006
7	M-MW-7	WT	G			4-3-18	1340																						007
8	M-MW-8	WT	G			4-5-18	0835																						008
9	M-BMW-1	WT	G			4-4-18	1525																						009
10	M-BMW-2	WT	G			4-4-18	1415																						010
11	M-DUP-1	WT	G			4-3-18	—																						011
12	M-FB-1	WT	G			4-4-18	1140		↓	↓		↓							↓	↓	↓	↓	↓						012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: Ba, Be, Co, Pb, Li, Mo, Ca, Mg, Na, K, Fe, Mn EPA 200.8: Sb, As, Cd, Cr, Se, Tl	Golder	4-5-18	1035		4/5/18	1035				
		4/5/18	1700	Fedex Corp post	4/6/18	0325	12.6	Y	Y	Y
							13.9			
							3.6			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ryan Feldmann

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 04/05/18

*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

MEMORANDUM

DATE May 2, 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, MERAMEC ENERGY CENTER – AMEREN GROUNDWATER – DATA PACKAGE 60267676

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).

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren-MEC-AM
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406.0004
Validation Date: 5/2/18

Laboratory: Pace Analytical
SDG #: 60267676
Analytical Method (type and no.): Metals 200.7 & 200.8, Hg 7470, Alkalinity 2302B, Anions 300.0, Rads 903.1 & 904.0
Matrix: ☐ Air ☐ Soil/Sed. ☐ Water ☐ Waste ☐
Sample Names M-MW-1, M-MW-2, M-MW-3, M-MW-4, M-MW-5, M-MW-6, M-MW-7, M-MW-8, M-BMW-1, M-BMW-2, M-DUP-1, M-FB-1, M-MW-3MS, M-MW-3 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?	☒	☐	☐	4/4/18-4/5/18
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☒	☐	☐	Ba(2.4),
b) Were analytes detected in the field blank(s)?	☐	☒	☐	
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ M-MW-7
	☒	☐	☐	FB-1@ M-MW-1
b) Were field dup. precision criteria met (note RPD)?	☐	☒	☐	Cd(90), Cr(200), Se(22.2), Fluoride(25.5), Ra-228(6
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
M-MW-1	Chloride	42.9	D	DF of 10
⊥	Sulfate	107	D	10
M-MW-2	Chloride	32.4	D	2
⊥	Sulfate	297	D	50
M-MW-3	Chloride	37.8	D	5
⊥	Sulfate	361	D	50
M-MW-4	Chloride	51.0	D	5
⊥	Sulfate	461	D	50
M-MW-5	Chloride	41.6	D	5
⊥	Sulfate	349	D	50
M-MW-6	Sulfate	738	D	50
M-MW-7	Chloride	61.1	D	10
⊥	Sulfate	1130	D	100
⊥	Cadmium (Cd)	0.22	J	RPD exceeded limit; Result > MDL
⊥	Chromium (Cr)	0.054	UJ	MDL > Result
⊥	Selenium (Se)	0.45	J	Result > MDL
⊥	Fluoride	0.31	J	⊥
⊥	Radium-228 (Ra-228)	0.890	J	Result > MDC
M-MW-8	Chloride	23.6	D	DF of 2
⊥		529	D	50
M-BMW-1	Chloride	136	D	20
⊥	Sulfate	110	D	20
M-BMW-2	None	—	—	—
M-DUP-1	Chloride	63.6	D	DF of 5
⊥	Sulfate	1160	D	⊥ 200
⊥	Cd	0.58	J	RPD exceeded limit; Result > MDL
⊥	Cr	0.065	J	⊥ ⊥
⊥	Se	0.36	J	⊥ ⊥
⊥	Fluoride	0.24	J	⊥ ⊥
⊥	Ra-228	0.590	UJ	⊥ MDC > Result
M-FB-1	None	—	—	—

Signature: Tommy McGood Jr (TM) Date: 5/2/2018

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

June 19, 2018

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

RE: Project: AMEREN MEC
Pace Project No.: 60270840

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory on May 19, 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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN MEC
Pace Project No.: 60270840

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
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

Pace Analytical Services, LLC
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(913)599-5665

CERTIFICATIONS

Project: AMEREN MEC
Pace Project No.: 60270840

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

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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SAMPLE SUMMARY

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60270840001	**M-MW-1**	Water	05/18/18 09:40	05/19/18 03:45
60270840002	**M-MW-2**	Water	05/17/18 10:20	05/19/18 03:45
60270840003	**M-MW-3**	Water	05/17/18 13:35	05/19/18 03:45
60270840004	**M-MW-4**	Water	05/17/18 15:55	05/19/18 03:45
60270840005	**M-MW-5**	Water	05/18/18 09:35	05/19/18 03:45
60270840006	**M-MW-6**	Water	05/18/18 11:15	05/19/18 03:45
60270840007	**M-MW-7**	Water	05/18/18 11:10	05/19/18 03:45
60270840008	**M-MW-8**	Water	05/17/18 14:35	05/19/18 03:45
60270840009	**M-BMW-1**	Water	05/17/18 15:30	05/19/18 03:45
60270840010	**M-BMW-2**	Water	05/17/18 12:00	05/19/18 03:45
60270840011	**M-DUP-1**	Water	05/17/18 08:00	05/19/18 03:45
60270840012	**M-FB-1**	Water	05/17/18 13:35	05/19/18 03:45
60270840013	**M-MW-3 MS**	Water	05/17/18 13:35	05/19/18 03:45
60270840014	**M-MW-3 MSD**	Water	05/17/18 13:35	05/19/18 03:45

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60270840001	M-MW-1	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840002	M-MW-2	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840003	M-MW-3	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840004	M-MW-4	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840005	M-MW-5	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840006	M-MW-6	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840007	**M-MW-7**	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840008	**M-MW-8**	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840009	**M-BMW-1**	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840010	**M-BMW-2**	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840011	**M-DUP-1**	EPA 200.7	BTS, LEC	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840012	**M-FB-1**	EPA 200.7	BTS	10	PASI-O
		EPA 200.8	CRT	2	PASI-O
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	LDB	1	PASI-K
		SM 2540C	JDA	1	PASI-K
		EPA 300.0	OL	3	PASI-K
60270840013	**M-MW-3 MS**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
60270840014	**M-MW-3 MSD**	EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-1 **Lab ID: 60270840001** Collected: 05/18/18 09:40 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**358**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:20	7440-39-3	
Boron	**44.0J**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 22:20	7440-42-8	
Calcium	**141000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 13:37	7440-70-2	
Iron	**15400**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:20	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:20	7439-93-2	
Magnesium	**43300**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:20	7439-95-4	
Manganese	**2050**	ug/L	25.0	12.5	5	05/29/18 03:30	05/30/18 13:37	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:20	7439-98-7	
Potassium	**1640**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:20	7440-09-7	
Sodium	**27900**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:20	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.2**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:23	7440-38-2	
Chromium	**0.52J**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:23	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**409**	mg/L	20.0	4.9	1		05/30/18 19:24		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**668**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**43.9**	mg/L	5.0	2.3	5		06/03/18 09:44	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	0.063	1		06/02/18 23:11	16984-48-8	
Sulfate	**105**	mg/L	10.0	2.4	10		06/03/18 09:59	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-2 **Lab ID: 60270840002** Collected: 05/17/18 10:20 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**328**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:23	7440-39-3	
Boron	**4210**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 22:23	7440-42-8	
Calcium	**133000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 14:08	7440-70-2	
Iron	**56800**	ug/L	200	100	5	05/29/18 03:30	05/30/18 14:08	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:23	7439-93-2	
Magnesium	**40200**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:23	7439-95-4	
Manganese	**6930**	ug/L	50.0	25.0	10	05/29/18 03:30	05/30/18 14:19	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:23	7439-98-7	
Potassium	**2490**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:23	7440-09-7	
Sodium	**43500**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:23	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.5**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:25	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:25	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**256**	mg/L	20.0	4.9	1		05/30/18 16:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**823**	mg/L	5.0	5.0	1		05/23/18 15:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**32.5**	mg/L	2.0	0.92	2		06/03/18 10:14	16887-00-6	
Fluoride	**0.13J**	mg/L	0.20	0.063	1		06/02/18 23:56	16984-48-8	
Sulfate	**287**	mg/L	20.0	4.7	20		06/03/18 10:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-3 **Lab ID: 60270840003** Collected: 05/17/18 13:35 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**264**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:32	7440-39-3	
Boron	**9560**	ug/L	250	125	5	05/29/18 03:30	05/30/18 14:23	7440-42-8	
Calcium	**166000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 14:23	7440-70-2	
Iron	**42300**	ug/L	200	100	5	05/29/18 03:30	05/30/18 14:23	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:32	7439-93-2	
Magnesium	**48500**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:32	7439-95-4	
Manganese	**3080**	ug/L	25.0	12.5	5	05/29/18 03:30	05/30/18 14:23	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:32	7439-98-7	
Potassium	**3850**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:32	7440-09-7	
Sodium	**41800**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:32	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**8.3**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:27	7440-38-2	
Chromium	**0.64J**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:27	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**247**	mg/L	20.0	4.9	1		05/30/18 16:05		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**905**	mg/L	5.0	5.0	1		05/23/18 15:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**37.9**	mg/L	5.0	2.3	5		06/03/18 10:44	16887-00-6	
Fluoride	**0.12J**	mg/L	0.20	0.063	1		06/03/18 00:11	16984-48-8	
Sulfate	**387**	mg/L	50.0	11.8	50		06/09/18 09:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-4 **Lab ID: 60270840004** Collected: 05/17/18 15:55 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**218**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:40	7440-39-3	
Boron	**10300**	ug/L	250	125	5	05/29/18 03:30	05/30/18 14:31	7440-42-8	
Calcium	**199000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 14:31	7440-70-2	
Iron	**30000**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:40	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:40	7439-93-2	
Magnesium	**53600**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:40	7439-95-4	
Manganese	**842**	ug/L	5.0	2.5	1	05/29/18 03:30	05/29/18 22:40	7439-96-5	
Molybdenum	**55.6**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:40	7439-98-7	
Potassium	**6530**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:40	7440-09-7	
Sodium	**49000**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:40	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**15.0**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:35	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:35	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**254**	mg/L	20.0	4.9	1		05/30/18 16:15		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1110**	mg/L	5.0	5.0	1		05/23/18 15:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**50.6**	mg/L	5.0	2.3	5		06/03/18 12:43	16887-00-6	
Fluoride	**0.18J**	mg/L	0.20	0.063	1		06/03/18 00:41	16984-48-8	
Sulfate	**527**	mg/L	50.0	11.8	50		06/09/18 10:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-5 **Lab ID: 60270840005** Collected: 05/18/18 09:35 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**259**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:43	7440-39-3	
Boron	**9240**	ug/L	250	125	5	05/29/18 03:30	05/30/18 14:35	7440-42-8	
Calcium	**184000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 14:35	7440-70-2	
Iron	**18800**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:43	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:43	7439-93-2	
Magnesium	**58200**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:43	7439-95-4	
Manganese	**480**	ug/L	5.0	2.5	1	05/29/18 03:30	05/29/18 22:43	7439-96-5	
Molybdenum	**105**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:43	7439-98-7	
Potassium	**5590**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:43	7440-09-7	
Sodium	**46200**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:43	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**22.1**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:37	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:37	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**349**	mg/L	20.0	4.9	1		05/30/18 19:38		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**992**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**42.0**	mg/L	5.0	2.3	5		06/03/18 13:13	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	0.063	1		06/03/18 00:56	16984-48-8	
Sulfate	**386**	mg/L	50.0	11.8	50		06/09/18 10:17	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-6 **Lab ID: 60270840006** Collected: 05/18/18 11:15 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**55.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:46	7440-39-3	
Boron	**13800**	ug/L	500	250	10	05/29/18 03:30	05/30/18 14:39	7440-42-8	
Calcium	**409000**	ug/L	5000	2500	10	05/29/18 03:30	05/30/18 14:39	7440-70-2	
Iron	**11000**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:46	7439-89-6	
Lithium	**419J**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:46	7439-93-2	
Magnesium	**30000**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:46	7439-95-4	
Manganese	**1560**	ug/L	50.0	25.0	10	05/29/18 03:30	05/30/18 14:39	7439-96-5	
Molybdenum	**140**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:46	7439-98-7	
Potassium	**14600**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:46	7440-09-7	
Sodium	**23800**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:46	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**5.5**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:39	7440-38-2	
Chromium	**0.71J**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:39	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**489**	mg/L	20.0	4.9	1		05/30/18 19:44		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1490**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.4**	mg/L	1.0	0.46	1		06/03/18 01:11	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.063	1		06/03/18 01:11	16984-48-8	
Sulfate	**709**	mg/L	50.0	11.8	50		06/09/18 10:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-7 **Lab ID: 60270840007** Collected: 05/18/18 11:10 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**40.2**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:49	7440-39-3	
Boron	**26900**	ug/L	500	250	10	05/29/18 03:30	05/30/18 14:43	7440-42-8	
Calcium	**414000**	ug/L	5000	2500	10	05/29/18 03:30	05/30/18 14:43	7440-70-2	
Iron	**<20.0**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:49	7439-89-6	
Lithium	**287J**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:49	7439-93-2	
Magnesium	**26100**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:49	7439-95-4	
Manganese	**12.5**	ug/L	5.0	2.5	1	05/29/18 03:30	05/29/18 22:49	7439-96-5	
Molybdenum	**560**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:49	7439-98-7	
Potassium	**20600**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:49	7440-09-7	
Sodium	**111000**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:49	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**4.8**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:49	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:49	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**120**	mg/L	20.0	4.9	1		05/30/18 19:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1900**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**72.4**	mg/L	5.0	2.3	5		06/03/18 14:27	16887-00-6	
Fluoride	**0.40**	mg/L	0.20	0.063	1		06/03/18 01:25	16984-48-8	
Sulfate	**1070**	mg/L	100	23.6	100		06/09/18 11:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-8 **Lab ID: 60270840008** Collected: 05/17/18 14:35 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**196**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:51	7440-39-3	
Boron	**10100**	ug/L	500	250	10	05/29/18 03:30	05/30/18 15:15	7440-42-8	
Calcium	**198000**	ug/L	5000	2500	10	05/29/18 03:30	05/30/18 15:15	7440-70-2	
Iron	**11200**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:51	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:51	7439-93-2	
Magnesium	**38000**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:51	7439-95-4	
Manganese	**2460**	ug/L	50.0	25.0	10	05/29/18 03:30	05/30/18 15:15	7439-96-5	
Molybdenum	**205**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:51	7439-98-7	
Potassium	**6600**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:51	7440-09-7	
Sodium	**35400**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:51	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**6.5**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:52	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:52	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**195**	mg/L	20.0	4.9	1		05/30/18 16:30		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**947**	mg/L	5.0	5.0	1		05/23/18 15:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**23.5**	mg/L	2.0	0.92	2		06/03/18 14:57	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	0.063	1		06/03/18 02:10	16984-48-8	
Sulfate	**536**	mg/L	50.0	11.8	50		06/09/18 11:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-BMW-1 **Lab ID: 60270840009** Collected: 05/17/18 15:30 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**251**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:54	7440-39-3	
Boron	**554**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 22:54	7440-42-8	
Calcium	**132000**	ug/L	2500	1250	5	05/29/18 03:30	05/30/18 14:55	7440-70-2	
Iron	**110**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:54	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:54	7439-93-2	
Magnesium	**31500**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:54	7439-95-4	
Manganese	**172**	ug/L	5.0	2.5	1	05/29/18 03:30	05/29/18 22:54	7439-96-5	
Molybdenum	**5.1J**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:54	7439-98-7	
Potassium	**3500**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:54	7440-09-7	
Sodium	**114000**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:54	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.5**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:54	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:54	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**362**	mg/L	20.0	4.9	1		05/30/18 16:35		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**770**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**152**	mg/L	20.0	9.2	20		06/03/18 15:42	16887-00-6	
Fluoride	**0.36**	mg/L	0.20	0.063	1		06/03/18 02:25	16984-48-8	
Sulfate	**84.3**	mg/L	5.0	1.2	5		06/09/18 11:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-BMW-2 **Lab ID: 60270840010** Collected: 05/17/18 12:00 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**566**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:57	7440-39-3	
Boron	**67.0**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 22:57	7440-42-8	
Calcium	**115000**	ug/L	5000	2500	10	05/29/18 03:30	05/30/18 15:07	7440-70-2	
Iron	**16300**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 22:57	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:57	7439-93-2	
Magnesium	**36600**	ug/L	500	250	1	05/29/18 03:30	05/29/18 22:57	7439-95-4	
Manganese	**4990**	ug/L	50.0	25.0	10	05/29/18 03:30	05/30/18 15:07	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 22:57	7439-98-7	
Potassium	**1480**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:57	7440-09-7	
Sodium	**20200**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 22:57	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.7**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:57	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:57	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**422**	mg/L	20.0	4.9	1		05/30/18 16:42		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**471**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.8**	mg/L	1.0	0.46	1		06/03/18 02:40	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.063	1		06/03/18 02:40	16984-48-8	
Sulfate	**19.7**	mg/L	2.0	0.47	2		06/09/18 12:01	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-DUP-1 **Lab ID: 60270840011** Collected: 05/17/18 08:00 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**339**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 23:06	7440-39-3	
Boron	**4350**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 23:06	7440-42-8	
Calcium	**133000**	ug/L	5000	2500	10	05/29/18 03:30	05/30/18 15:11	7440-70-2	
Iron	**56900**	ug/L	400	200	10	05/29/18 03:30	05/30/18 15:11	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 23:06	7439-93-2	
Magnesium	**41300**	ug/L	500	250	1	05/29/18 03:30	05/29/18 23:06	7439-95-4	
Manganese	**6620**	ug/L	50.0	25.0	10	05/29/18 03:30	05/30/18 15:11	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 23:06	7439-98-7	
Potassium	**2520**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 23:06	7440-09-7	
Sodium	**44700**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 23:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.4**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:59	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 19:59	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**249**	mg/L	20.0	4.9	1		05/30/18 16:46		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**783**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**32.4**	mg/L	2.0	0.92	2		06/03/18 16:12	16887-00-6	
Fluoride	**0.12J**	mg/L	0.20	0.063	1		06/03/18 02:55	16984-48-8	
Sulfate	**293**	mg/L	20.0	4.7	20		06/09/18 12:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-FB-1 **Lab ID: 60270840012** Collected: 05/17/18 13:35 Received: 05/19/18 03:45 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 MET ICP	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7								
Barium	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 23:08	7440-39-3	
Boron	**<25.0**	ug/L	50.0	25.0	1	05/29/18 03:30	05/29/18 23:08	7440-42-8	
Calcium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 23:08	7440-70-2	
Iron	**<20.0**	ug/L	40.0	20.0	1	05/29/18 03:30	05/29/18 23:08	7439-89-6	
Lithium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 23:08	7439-93-2	
Magnesium	**<250**	ug/L	500	250	1	05/29/18 03:30	05/29/18 23:08	7439-95-4	
Manganese	**<2.5**	ug/L	5.0	2.5	1	05/29/18 03:30	05/29/18 23:08	7439-96-5	
Molybdenum	**<5.0**	ug/L	10.0	5.0	1	05/29/18 03:30	05/29/18 23:08	7439-98-7	
Potassium	**<500**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 23:08	7440-09-7	
Sodium	**<500**	ug/L	1000	500	1	05/29/18 03:30	05/29/18 23:08	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 20:01	7440-38-2	
Chromium	**<0.50**	ug/L	1.0	0.50	1	05/29/18 03:31	05/29/18 20:01	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		05/30/18 17:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		05/24/18 17:29		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**<0.46**	mg/L	1.0	0.46	1		06/03/18 03:10	16887-00-6	
Fluoride	**<0.063**	mg/L	0.20	0.063	1		06/03/18 03:10	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		06/03/18 03:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 450566 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

METHOD BLANK: 2441146 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<5.0	10.0	5.0	05/29/18 22:15	
Boron	ug/L	<25.0	50.0	25.0	05/29/18 22:15	
Calcium	ug/L	<250	500	250	05/29/18 22:15	
Iron	ug/L	<20.0	40.0	20.0	05/29/18 22:15	
Lithium	ug/L	<250	500	250	05/29/18 22:15	
Magnesium	ug/L	<250	500	250	05/29/18 22:15	
Manganese	ug/L	<2.5	5.0	2.5	05/29/18 22:15	
Molybdenum	ug/L	<5.0	10.0	5.0	05/29/18 22:15	
Potassium	ug/L	<500	1000	500	05/29/18 22:15	
Sodium	ug/L	<500	1000	500	05/29/18 22:15	

LABORATORY CONTROL SAMPLE: 2441147

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	250	256	102	85-115	
Boron	ug/L	2500	2480	99	85-115	
Calcium	ug/L	12500	13100	105	85-115	
Iron	ug/L	2500	2620	105	85-115	
Lithium	ug/L	12500	11800	94	85-115	
Magnesium	ug/L	12500	12700	102	85-115	
Manganese	ug/L	250	264	106	85-115	
Molybdenum	ug/L	250	256	102	85-115	
Potassium	ug/L	12500	12300	99	85-115	
Sodium	ug/L	12500	12700	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2441148 2441149

Parameter	Units	60270840003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	264	250	250	526	524	105	104	70-130	0	20	
Boron	ug/L	9560	2500	2500	12300	12300	109	108	70-130	0	20	E
Calcium	ug/L	166000	12500	12500	181000	180000	118	111	70-130	0	20	E
Iron	ug/L	42300	2500	2500	44500	44300	87	81	70-130	0	20	E
Lithium	ug/L	<250	12500	12500	12600	12600	100	100	70-130	1	20	
Magnesium	ug/L	48500	12500	12500	62000	61700	108	106	70-130	1	20	
Manganese	ug/L	3080	250	250	3270	3270	75	77	70-130	0	20	E
Molybdenum	ug/L	<5.0	250	250	272	269	107	106	70-130	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2441148 2441149

Parameter	Units	60270840003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Potassium	ug/L	3850	12500	12500	17200	17100	106	106	70-130	0	20	
Sodium	ug/L	41800	12500	12500	55300	55300	108	108	70-130	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2441150 2441151

Parameter	Units	60270840012 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	<5.0	250	250	262	267	105	107	70-130	2	20	
Boron	ug/L	<25.0	2500	2500	2530	2570	101	102	70-130	1	20	
Calcium	ug/L	<250	12500	12500	13400	13600	107	109	70-130	2	20	
Iron	ug/L	<20.0	2500	2500	2690	2740	107	110	70-130	2	20	
Lithium	ug/L	<250	12500	12500	12100	12400	97	99	70-130	2	20	
Magnesium	ug/L	<250	12500	12500	13000	13300	104	106	70-130	2	20	
Manganese	ug/L	<2.5	250	250	270	273	108	109	70-130	1	20	
Molybdenum	ug/L	<5.0	250	250	262	266	104	106	70-130	2	20	
Potassium	ug/L	<500	12500	12500	12600	12900	101	102	70-130	2	20	
Sodium	ug/L	<500	12500	12500	13000	13200	103	105	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 450567 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

METHOD BLANK: 2441152 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.50	1.0	0.50	05/29/18 18:49	
Chromium	ug/L	<0.50	1.0	0.50	05/29/18 18:49	

LABORATORY CONTROL SAMPLE: 2441153

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	50	49.2	98	85-115	
Chromium	ug/L	50	50.8	102	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2441154 2441155

Parameter	Units	35394166001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	3.6	50	50	52.7	51.9	98	97	70-130	1	20	
Chromium	ug/L	1.7	50	50	53.5	54.0	103	105	70-130	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2441156 2441157

Parameter	Units	60270840003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	8.3	50	50	59.8	59.4	103	102	70-130	1	20	
Chromium	ug/L	0.64J	50	50	59.1	56.4	117	111	70-130	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 527707 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60270840002, 60270840003, 60270840004, 60270840008, 60270840009, 60270840010, 60270840011

METHOD BLANK: 2162061 Matrix: Water
Associated Lab Samples: 60270840002, 60270840003, 60270840004, 60270840008, 60270840009, 60270840010, 60270840011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	05/30/18 14:32	

LABORATORY CONTROL SAMPLE: 2162062

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	547	109	90-110	

SAMPLE DUPLICATE: 2162063

Parameter	Units	60270797002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	56.3	56.7	1	10	

SAMPLE DUPLICATE: 2162064

Parameter	Units	60270840003 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	247	256	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 527946 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60270840001, 60270840005, 60270840006, 60270840007, 60270840012

METHOD BLANK: 2162852 Matrix: Water
Associated Lab Samples: 60270840001, 60270840005, 60270840006, 60270840007, 60270840012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	05/30/18 17:49	

LABORATORY CONTROL SAMPLE: 2162853

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	516	103	90-110	

SAMPLE DUPLICATE: 2162854

Parameter	Units	60270840012 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	111		10	

SAMPLE DUPLICATE: 2162855

Parameter	Units	60271006002 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	220	226	3	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 526981 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60270840002, 60270840003, 60270840004, 60270840008

METHOD BLANK: 2158599 Matrix: Water
Associated Lab Samples: 60270840002, 60270840003, 60270840004, 60270840008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/23/18 15:45	

LABORATORY CONTROL SAMPLE: 2158600

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

SAMPLE DUPLICATE: 2158601

Parameter	Units	60270834003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	283	286	1	10	

SAMPLE DUPLICATE: 2158602

Parameter	Units	60270840003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	905	907	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 527157 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60270840001, 60270840005, 60270840006, 60270840007, 60270840009, 60270840010, 60270840011, 60270840012

METHOD BLANK: 2159302 Matrix: Water
Associated Lab Samples: 60270840001, 60270840005, 60270840006, 60270840007, 60270840009, 60270840010, 60270840011, 60270840012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	05/24/18 17:29	

LABORATORY CONTROL SAMPLE: 2159303

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	100	80-120	

SAMPLE DUPLICATE: 2159304

Parameter	Units	60270840009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	770	773	0	10	

SAMPLE DUPLICATE: 2159305

Parameter	Units	60271006002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1410	1410	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 528270 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

METHOD BLANK: 2163971 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/02/18 22:12	
Fluoride	mg/L	<0.063	0.20	0.063	06/02/18 22:12	
Sulfate	mg/L	<0.24	1.0	0.24	06/02/18 22:12	

LABORATORY CONTROL SAMPLE: 2163972

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2163973 2163974

Parameter	Units	60270840001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.28	2.5	2.5	2.8	3.0	102	109	90-110	6	15	

MATRIX SPIKE SAMPLE: 2163975

Parameter	Units	60270840003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	0.12J	2.5	2.7	104	90-110	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 528386 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840007, 60270840008, 60270840009, 60270840011

METHOD BLANK: 2164755 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840007, 60270840008, 60270840009, 60270840011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.46	1.0	0.46	06/03/18 09:14	
Sulfate	mg/L	<0.24	1.0	0.24	06/03/18 09:14	

LABORATORY CONTROL SAMPLE: 2164756

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2164757 2164758

Parameter	Units	60270840003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	37.9	25	25	63.8	63.6	104	103	90-110	0	15	

MATRIX SPIKE SAMPLE: 2164759

Parameter	Units	60271161001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	100	50	150	99	90-110	

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QUALITY CONTROL DATA

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 529291 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011

METHOD BLANK: 2168473 Matrix: Water
Associated Lab Samples: 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
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
Sulfate	mg/L	5	5.0	100	90-110	

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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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-1 **Lab ID: 60270840001** Collected: 05/18/18 09:40 Received: 05/19/18 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	**0.409 ± 0.381 (0.502) C:NA T:77%**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**0.683 ± 0.484 (0.949) C:71% T:82%**	pCi/L	06/15/18 15:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-2 **Lab ID: 60270840002** Collected: 05/17/18 10:20 Received: 05/19/18 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	**0.820 ± 0.547 (0.703) C:NA T:91%**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**1.11 ± 0.578 (1.04) C:71% T:78%**	pCi/L	06/15/18 15:51	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-3 **Lab ID: 60270840003** Collected: 05/17/18 13:35 Received: 05/19/18 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	**0.568 ± 0.422 (0.528) C:NA T:99%**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**0.922 ± 0.489 (0.873) C:71% T:79%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-4 **Lab ID: 60270840004** Collected: 05/17/18 15:55 Received: 05/19/18 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	**0.579 ± 0.365 (0.157) C:NA T:94%**	pCi/L	06/14/18 21:42	13982-63-3	
Radium-228	EPA 904.0	**0.0699 ± 0.405 (0.925) C:73% T:75%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-5 **Lab ID: 60270840005** Collected: 05/18/18 09:35 Received: 05/19/18 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	**0.317 ± 0.375 (0.589) C:NA T:86%**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**0.667 ± 0.499 (0.981) C:60% T:84%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-6 **Lab ID: 60270840006** Collected: 05/18/18 11:15 Received: 05/19/18 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	**0.0566 ± 0.258 (0.526) C:NA T:91%**	pCi/L	06/14/18 21:53	13982-63-3	
Radium-228	EPA 904.0	**0.756 ± 0.528 (1.03) C:69% T:80%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-7 **Lab ID: 60270840007** Collected: 05/18/18 11:10 Received: 05/19/18 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	**0.387 ± 0.539 (0.899) C:NA T:77%**	pCi/L	06/15/18 19:48	13982-63-3	
Radium-228	EPA 904.0	**0.323 ± 0.456 (0.978) C:70% T:76%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-8 **Lab ID: 60270840008** Collected: 05/17/18 14:35 Received: 05/19/18 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	**0.852 ± 0.735 (1.09) C:NA T:86%**	pCi/L	06/15/18 20:02	13982-63-3	
Radium-228	EPA 904.0	**0.163 ± 0.387 (0.861) C:75% T:72%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-BMW-1 **Lab ID: 60270840009** Collected: 05/17/18 15:30 Received: 05/19/18 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	**0.905 ± 0.711 (0.988) C:NA T:85%**	pCi/L	06/15/18 20:02	13982-63-3	
Radium-228	EPA 904.0	**0.610 ± 0.429 (0.826) C:73% T:76%**	pCi/L	06/15/18 15:52	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-BMW-2 **Lab ID: 60270840010** Collected: 05/17/18 12:00 Received: 05/19/18 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	**0.000 ± 0.549 (1.14) C:NA T:86%**	pCi/L	06/15/18 20:02	13982-63-3	
Radium-228	EPA 904.0	**0.366 ± 0.308 (0.607) C:74% T:84%**	pCi/L	06/15/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-DUP-1 **Lab ID: 60270840011** Collected: 05/17/18 08:00 Received: 05/19/18 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	**0.440 ± 0.624 (1.06) C:NA T:79%**	pCi/L	06/15/18 20:02	13982-63-3	
Radium-228	EPA 904.0	**0.658 ± 0.394 (0.713) C:69% T:85%**	pCi/L	06/15/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-FB-1 **Lab ID: 60270840012** Collected: 05/17/18 13:35 Received: 05/19/18 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	**0.0858 ± 0.392 (0.632) C:NA T:86%**	pCi/L	06/15/18 20:02	13982-63-3	
Radium-228	EPA 904.0	**0.392 ± 0.412 (0.854) C:74% T:73%**	pCi/L	06/15/18 15:54	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-3 MS **Lab ID: 60270840013** Collected: 05/17/18 13:35 Received: 05/19/18 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	**95.8 %REC +/- NA (NA) C:NA T:NA**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**127.85 %REC ± NA (NA) C:NA T:NA**	pCi/L	06/15/18 15:54	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

Sample: M-MW-3 MSD **Lab ID: 60270840014** Collected: 05/17/18 13:35 Received: 05/19/18 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	**107 %REC 10.9 RPD +/- NA (NA) C:NA T:NA**	pCi/L	06/14/18 21:41	13982-63-3	
Radium-228	EPA 904.0	**134.93 %REC 5.39 RPD ± NA (NA) C:NA T:NA**	pCi/L	06/15/18 15:54	15262-20-1	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 300532 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

METHOD BLANK: 1470784 Matrix: Water
Associated Lab Samples: 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.163 ± 0.451 (0.876) C:NA T:89%	pCi/L	06/15/18 19:48	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 300530 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840013, 60270840014

METHOD BLANK: 1470779 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840013, 60270840014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.125 ± 0.286 (0.170) C:NA T:90%	pCi/L	06/14/18 20:57	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MEC
Pace Project No.: 60270840

QC Batch: 300866 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012, 60270840013, 60270840014

METHOD BLANK: 1472491 Matrix: Water
Associated Lab Samples: 60270840001, 60270840002, 60270840003, 60270840004, 60270840005, 60270840006, 60270840007, 60270840008, 60270840009, 60270840010, 60270840011, 60270840012, 60270840013, 60270840014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0310 ± 0.395 (0.924) C:74% T:77%	pCi/L	06/15/18 15:51	

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QUALIFIERS

Project: AMEREN MEC
Pace Project No.: 60270840

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270840001	**M-MW-1**	EPA 200.7	450566	EPA 200.7	450579
60270840002	**M-MW-2**	EPA 200.7	450566	EPA 200.7	450579
60270840003	**M-MW-3**	EPA 200.7	450566	EPA 200.7	450579
60270840004	**M-MW-4**	EPA 200.7	450566	EPA 200.7	450579
60270840005	**M-MW-5**	EPA 200.7	450566	EPA 200.7	450579
60270840006	**M-MW-6**	EPA 200.7	450566	EPA 200.7	450579
60270840007	**M-MW-7**	EPA 200.7	450566	EPA 200.7	450579
60270840008	**M-MW-8**	EPA 200.7	450566	EPA 200.7	450579
60270840009	**M-BMW-1**	EPA 200.7	450566	EPA 200.7	450579
60270840010	**M-BMW-2**	EPA 200.7	450566	EPA 200.7	450579
60270840011	**M-DUP-1**	EPA 200.7	450566	EPA 200.7	450579
60270840012	**M-FB-1**	EPA 200.7	450566	EPA 200.7	450579
60270840001	**M-MW-1**	EPA 200.8	450567	EPA 200.8	450578
60270840002	**M-MW-2**	EPA 200.8	450567	EPA 200.8	450578
60270840003	**M-MW-3**	EPA 200.8	450567	EPA 200.8	450578
60270840004	**M-MW-4**	EPA 200.8	450567	EPA 200.8	450578
60270840005	**M-MW-5**	EPA 200.8	450567	EPA 200.8	450578
60270840006	**M-MW-6**	EPA 200.8	450567	EPA 200.8	450578
60270840007	**M-MW-7**	EPA 200.8	450567	EPA 200.8	450578
60270840008	**M-MW-8**	EPA 200.8	450567	EPA 200.8	450578
60270840009	**M-BMW-1**	EPA 200.8	450567	EPA 200.8	450578
60270840010	**M-BMW-2**	EPA 200.8	450567	EPA 200.8	450578
60270840011	**M-DUP-1**	EPA 200.8	450567	EPA 200.8	450578
60270840012	**M-FB-1**	EPA 200.8	450567	EPA 200.8	450578
60270840001	**M-MW-1**	EPA 903.1	300530		
60270840002	**M-MW-2**	EPA 903.1	300530		
60270840003	**M-MW-3**	EPA 903.1	300530		
60270840004	**M-MW-4**	EPA 903.1	300530		
60270840005	**M-MW-5**	EPA 903.1	300530		
60270840006	**M-MW-6**	EPA 903.1	300530		
60270840007	**M-MW-7**	EPA 903.1	300532		
60270840008	**M-MW-8**	EPA 903.1	300532		
60270840009	**M-BMW-1**	EPA 903.1	300532		
60270840010	**M-BMW-2**	EPA 903.1	300532		
60270840011	**M-DUP-1**	EPA 903.1	300532		
60270840012	**M-FB-1**	EPA 903.1	300532		
60270840013	**M-MW-3 MS**	EPA 903.1	300530		
60270840014	**M-MW-3 MSD**	EPA 903.1	300530		
60270840001	**M-MW-1**	EPA 904.0	300866		
60270840002	**M-MW-2**	EPA 904.0	300866		
60270840003	**M-MW-3**	EPA 904.0	300866		
60270840004	**M-MW-4**	EPA 904.0	300866		
60270840005	**M-MW-5**	EPA 904.0	300866		
60270840006	**M-MW-6**	EPA 904.0	300866		
60270840007	**M-MW-7**	EPA 904.0	300866		
60270840008	**M-MW-8**	EPA 904.0	300866		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270840009	**M-BMW-1**	EPA 904.0	300866		
60270840010	**M-BMW-2**	EPA 904.0	300866		
60270840011	**M-DUP-1**	EPA 904.0	300866		
60270840012	**M-FB-1**	EPA 904.0	300866		
60270840013	**M-MW-3 MS**	EPA 904.0	300866		
60270840014	**M-MW-3 MSD**	EPA 904.0	300866		
60270840001	**M-MW-1**	SM 2320B	527946		
60270840002	**M-MW-2**	SM 2320B	527707		
60270840003	**M-MW-3**	SM 2320B	527707		
60270840004	**M-MW-4**	SM 2320B	527707		
60270840005	**M-MW-5**	SM 2320B	527946		
60270840006	**M-MW-6**	SM 2320B	527946		
60270840007	**M-MW-7**	SM 2320B	527946		
60270840008	**M-MW-8**	SM 2320B	527707		
60270840009	**M-BMW-1**	SM 2320B	527707		
60270840010	**M-BMW-2**	SM 2320B	527707		
60270840011	**M-DUP-1**	SM 2320B	527707		
60270840012	**M-FB-1**	SM 2320B	527946		
60270840001	**M-MW-1**	SM 2540C	527157		
60270840002	**M-MW-2**	SM 2540C	526981		
60270840003	**M-MW-3**	SM 2540C	526981		
60270840004	**M-MW-4**	SM 2540C	526981		
60270840005	**M-MW-5**	SM 2540C	527157		
60270840006	**M-MW-6**	SM 2540C	527157		
60270840007	**M-MW-7**	SM 2540C	527157		
60270840008	**M-MW-8**	SM 2540C	526981		
60270840009	**M-BMW-1**	SM 2540C	527157		
60270840010	**M-BMW-2**	SM 2540C	527157		
60270840011	**M-DUP-1**	SM 2540C	527157		
60270840012	**M-FB-1**	SM 2540C	527157		
60270840001	**M-MW-1**	EPA 300.0	528270		
60270840001	**M-MW-1**	EPA 300.0	528386		
60270840002	**M-MW-2**	EPA 300.0	528270		
60270840002	**M-MW-2**	EPA 300.0	528386		
60270840003	**M-MW-3**	EPA 300.0	528270		
60270840003	**M-MW-3**	EPA 300.0	528386		
60270840003	**M-MW-3**	EPA 300.0	529291		
60270840004	**M-MW-4**	EPA 300.0	528270		
60270840004	**M-MW-4**	EPA 300.0	528386		

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MEC
Pace Project No.: 60270840

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60270840004	**M-MW-4**	EPA 300.0	529291		
60270840005	**M-MW-5**	EPA 300.0	528270		
60270840005	**M-MW-5**	EPA 300.0	528386		
60270840005	**M-MW-5**	EPA 300.0	529291		
60270840006	**M-MW-6**	EPA 300.0	528270		
60270840006	**M-MW-6**	EPA 300.0	529291		
60270840007	**M-MW-7**	EPA 300.0	528270		
60270840007	**M-MW-7**	EPA 300.0	528386		
60270840007	**M-MW-7**	EPA 300.0	529291		
60270840008	**M-MW-8**	EPA 300.0	528270		
60270840008	**M-MW-8**	EPA 300.0	528386		
60270840008	**M-MW-8**	EPA 300.0	529291		
60270840009	**M-BMW-1**	EPA 300.0	528270		
60270840009	**M-BMW-1**	EPA 300.0	528386		
60270840009	**M-BMW-1**	EPA 300.0	529291		
60270840010	**M-BMW-2**	EPA 300.0	528270		
60270840010	**M-BMW-2**	EPA 300.0	529291		
60270840011	**M-DUP-1**	EPA 300.0	528270		
60270840011	**M-DUP-1**	EPA 300.0	528386		
60270840011	**M-DUP-1**	EPA 300.0	529291		
60270840012	**M-FB-1**	EPA 300.0	528270		

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Sample Condition Upon Receipt

WO# : 60270840

60270840

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 ☑ zip

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

Cooler Temperature (°C): As-read 5.0 Amb Corr. Factor +1.1 **Corrected** 6.1

Date and initials of person examining contents: 5/19/18 SD

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jann Check 5/21/18

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

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:	rhaddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren MEC	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406-0004B	Pace Profile #:	9285, line 3

REGULATORY AGENCY: NPDES (GROUND WATER) DRINKING WATER; UST RCRA OTHER ____

Site Location STATE: MO

Requested Analysis Filtered (Y/N)

ITEM #	Section D Required Client Information: SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Metals*	Chloride/Fluoride/Sulfate	TDS	Alkalinity	Radium 226+228								Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
	Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS																N	N	N	N	N									
1	M-MW-1	WT	G			5/18/18	0940		4	1		3					✓	✓	✓	✓	✓	2 BP1N, BP3N,								BP2U	60270840 01
2	M-MW-2	WT	G			5/17/18	1020		4	1		3																		02
3	M-MW-3	WT	G				1335		12	3		9										6 BP1N 3 BP3N								3 BP2U	03
4	M-MW-4	WT	G				1555		4	1		3										2 BP1N, BP3N								BP2U	04
5	M-MW-5	WT	G			5/18/18	0935																								05
6	M-MW-6	WT	G				1115																								06
7	M-MW-7	WT	G				1110																								07
8	M-MW-8	WT	G			5/17/18	1435		4	1		3																			08
9	M-BMW-1	WT	G			5/17/18	1530																								09
10	M-BMW-2	WT	G			5/17/18	1200																								010
11	M-DUP-1	WT	G			5/17/18	—																								011
12	M-FB-1	WT	G			5/17/18	1335																								012

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*EPA 200.7: B, Ca, Mg, K, Na, Fe, Mn, Ba, Li, Mo; EPA 200.8: As, Cr	Golder	5/18/18	1410		5/18/18	1410	
		5/18/18	1700	E Bradley Pace	5/19	0745	5.0 Y Y Y
							4mB N —
							4aB N —

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Ryan Feldmann					
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):				

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 – MERAMEC ENERGY CENTER - MEC - DETECTION MONITORING - DATA PACKAGE 60270840

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).

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren GW - MEC - DMR
Reviewer: T Goodwin

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

Laboratory: Pace Analytical
SDG #: 60270840
Analytical Method (type and no.): 200.7 Metals, Total; 2320B Alkalinity; 2540C TDS; 300.0 Anions, Ra 903.1 + 904.0
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐
Sample Names M-MW-1, M-MW-2, M-MW-3, M-MW-4, M-MW-5, M-MW-6, M-MW-7, M-MW-8, M-BMW-1, M-BMW-2, M-DUP-1, M-FB-1, M-MW-3 MS, M-MW-3 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?	☒	☐	☐	
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Flow, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies:

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☐	☐	☒	
b) Were hold times met for sample analysis?	☑	☐	☐	
c) Were the correct preservatives used?	☒	☐	☐	
d) Was the correct method used?	☒	☐	☐	
e) Were appropriate reporting limits achieved?	☒	☐	☐	
f) Were any sample dilutions noted?	☑	☐	☐	Chloride, Sulfate, Ca, Fe, Mg, B
g) Were any matrix problems noted?	☐	☑	☐	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ M-MW-2
	☒	☐	☐	FB-1@ M-MW-8
b) Were field dup. precision criteria met (note RPD)?	☐	☑	☐	M-MW-2: $R_{a-226} + R_{a-228}$
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
M-MW-1	Calcium (Ca)	141000	D	Analyzed @ a dilution
	Magnesium (Mg)	2050		
	Chloride	43.9		
	Sulfate	105		
M-MW-2	Ca	133000		
	Mg	6930		
	Iron (Fe)	56800		
	Chloride	32.5		
	Sulfate	287		
	Radium-226	0.820	J	RPD exceeded limits
	Radium-228	1.11	J	"
M-MW-3	Boron (B)	9560	D	Analyzed @ Dilution
	Ca	166000		
	Fe	42300		
	Mg	48500		
	Chloride	37.9		
	Sulfate	387		
M-MW-4	B	10800		
	Ca	199000		
	Chloride	50.6		
	Sulfate	527		
M-MW-5	B	9240		
	Ca	184000		
	Chloride	42.0		
	Sulfate	386		
M-MW-6	B	13800		
	Ca	409000		
	Mg	1560		
	Chloride	18.4		
	Sulfate	709		
	Continue on Next Page			

Signature: Tommy Hood Jr. Date: 8/20/2018

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
M-MW-7	B	26900	D	Analyzed @ Dilution
	Ca	414000		
	Chloride	72.4		
	Sulfate	1070		
M-MW-8	B	10100		
	Ca	198000		
	Mg	38000		
	Chloride	23.5		
	Sulfate	536		
M-BMW-1	Ca	132000		
	(Cl^-) Chloride	152		
	(SO_4^{2-}) Sulfate	84.3		
M-BMW-2	Ca	115000		
	Mg	4980		
	SO_4^{2-}	19.7		
M-DUP-1	Ca	133000		
	Fe	56900		
	Mg	6620		
	Cl^-	32.4		
	SO_4^{2-}	293		

Signature: [signature]

Date: 8/20/2018

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

July 11, 2018

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

RE: Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

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

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

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

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

SAMPLE SUMMARY

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60274098001	**M-MW-3**	Water	07/03/18 11:30	07/04/18 04:40

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SAMPLE ANALYTE COUNT

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60274098001	**M-MW-3**	SM 2540C	JDA	1	PASI-K

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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ANALYTICAL RESULTS

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

Sample: M-MW-3 **Lab ID: 60274098001** Collected: 07/03/18 11:30 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	**926**	mg/L	5.0	5.0	1		07/09/18 11:21		

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

QC Batch: 533427 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60274098001

METHOD BLANK: 2184817 Matrix: Water
Associated Lab Samples: 60274098001

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	

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

REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

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

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN CCR GW MONITORING
Pace Project No.: 60274098

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60274098001	**M-MW-3**	SM 2540C	533427		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60274098

60274098

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: 201 **Type of Ice:** (Wet) Blue None JLS

Cooler Temperature (°C): **As-read** 2.2 **Corr. Factor** +1.0 **Corrected** 3.2

Date and initials of person examining contents: 07/5

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jami Check 7/5/18

Project Manager Review: _____ Date: _____

Pace Analytical™
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

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

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram, Ryan Feldmann
Purchase Order No.:	
Project Name:	Ameren CCR GW Monitoring
Project Number:	153-1406.0004

Section C Invoice Information:

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

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N		60274098
1	MW-3	WT	G			7/3/18	1130		2	✓		✓												✓		BP2U BPSU 001
2		WT	G																							
3		WT	G																							
4		WT	G																							
5		WT	G																							
6		WT	G																							
7		WT	G																							
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Golder	7/3/18	1800		7/4	0440	3.2	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Ryan Feldmann

SIGNATURE of SAMPLER: DATE Signed (MM/DD/YY): 07/03/18

*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

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, MERAMEC ENERGY CENTER– AMEREN GROUNDWATER – DATA PACKAGE 60274098

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

- No data qualification was required.

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - GW - MEC - VS July 2018
Reviewer: T Goodwin

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

Laboratory: Pace Analytical
Analytical Method (type and no.): SM2540C (TDS)

SDG #: 60274098

Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____
Sample Names M-MW-3

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

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

Note Deficiencies: _____

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

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

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

Duplicates	**YES**	**NO**	**NA**	**COMMENTS**
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ NA
	☒ Th	☑	☐	FB-1@ NA
b) Were field dup. precision criteria met (note RPD)?	☒ Th	☐	☑	
c) Were lab duplicates analyzed (note original and duplicate samples)?				
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

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

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
None				

Signature: Tommy J. Good Jr.   Date: 8/20/2018

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

January 24, 2019

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

RE: Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Dear Mark Haddock:
Enclosed are the analytical results for sample(s) received by the laboratory between November 20, 2018 and November 21, 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, 12/18/18: Sample list trimmed.
REV-1A, 1/24/19: Project name revised.

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

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

CERTIFICATIONS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

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

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

SAMPLE SUMMARY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60287288001	**M-MW-2**	Water	11/19/18 10:25	11/20/18 04:15
60287288002	**M-MW-3**	Water	11/19/18 12:45	11/20/18 04:15
60287288003	**M-MW-4**	Water	11/19/18 14:25	11/20/18 04:15
60287288004	**M-MW-5**	Water	11/19/18 15:30	11/20/18 04:15
60287288005	**M-MW-6**	Water	11/19/18 12:35	11/20/18 04:15
60287288006	**M-MW-7**	Water	11/19/18 13:25	11/20/18 04:15
60287288007	**M-MW-8**	Water	11/19/18 15:00	11/20/18 04:15
60287288008	**M-BMW-1**	Water	11/19/18 15:25	11/20/18 04:15
60287288009	**M-BMW-2**	Water	11/19/18 11:20	11/20/18 04:15
60287288011	**M-DUP-1**	Water	11/19/18 09:55	11/20/18 04:15
60287288012	**M-DUP-2**	Water	11/19/18 09:55	11/20/18 04:15
60287288013	**M-FB-1**	Water	11/19/18 12:40	11/20/18 04:15
60287288014	**M-FB-2**	Water	11/19/18 14:30	11/20/18 04:15
60287288017	**M-MW-1**	Water	11/20/18 15:05	11/21/18 03:30

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

SAMPLE ANALYTE COUNT

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60287288001	**M-MW-2**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288002	**M-MW-3**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288003	**M-MW-4**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288004	**M-MW-5**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 3500-Fe B#4	RMT	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
		EPA 365.4	BLA	1	PASI-K
60287288005	**M-MW-6**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288006	**M-MW-7**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288007	**M-MW-8**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288008	**M-BMW-1**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

Pace Analytical Services, LLC
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Lenexa, KS 66219
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SAMPLE ANALYTE COUNT

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288009	**M-BMW-2**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288011	**M-DUP-1**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288012	**M-DUP-2**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288013	**M-FB-1**	EPA 200.7	EMR	10	PASI-K

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SAMPLE ANALYTE COUNT

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288014	**M-FB-2**	EPA 200.7	EMR	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		SM 2320B	RLG	1	PASI-K
		SM 2540C	RLG	1	PASI-K
		SM 3500-Fe B#4	LDB	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
60287288017	**M-MW-1**	EPA 200.7	EMR, JGP	10	PASI-K
		EPA 200.8	JDH	2	PASI-K
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	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	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 MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-2 **Lab ID: 60287288001** Collected: 11/19/18 10:25 Received: 11/20/18 04:15 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								
Barium	**299**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:26	7440-39-3	
Boron	**4380**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:26	7440-42-8	
Calcium	**119000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:26	7440-70-2	
Iron	**44600**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:26	7439-89-6	
Lithium	**6.4J**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:26	7439-93-2	
Magnesium	**37900**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:26	7439-95-4	
Manganese	**5720**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:26	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:26	7439-98-7	
Potassium	**2190**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:26	7440-09-7	
Sodium	**40000**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:26	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.7**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:28	7440-38-2	
Chromium	**0.31J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:28	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**266**	mg/L	20.0	4.9	1		11/29/18 13:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**796**	mg/L	5.0	5.0	1		11/21/18 14:50		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**24.6**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**20.0**	mg/L	1.0	0.060	5		11/21/18 12:16		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**31.3**	mg/L	2.0	0.58	2		12/13/18 14:28	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/13/18 14:13	16984-48-8	
Sulfate	**315**	mg/L	50.0	12.0	50		12/13/18 14:42	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.7**	mg/L	0.10	0.050	1		11/26/18 13:55	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-3 **Lab ID: 60287288002** Collected: 11/19/18 12:45 Received: 11/20/18 04:15 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								
Barium	**232**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:33	7440-39-3	
Boron	**9320**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:33	7440-42-8	
Calcium	**152000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:33	7440-70-2	
Iron	**35700**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:33	7439-89-6	
Lithium	**5.1J**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:33	7439-93-2	
Magnesium	**45100**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:33	7439-95-4	
Manganese	**2630**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:33	7439-96-5	
Molybdenum	**3.6J**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:33	7439-98-7	
Potassium	**3490**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:33	7440-09-7	
Sodium	**39100**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:33	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**7.8**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:30	7440-38-2	
Chromium	**0.30J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:30	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**280**	mg/L	20.0	4.9	1		11/29/18 13:52		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**875**	mg/L	5.0	5.0	1		11/21/18 14:50		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**13.6**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**22.1**	mg/L	1.0	0.060	5		11/21/18 12:18		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**35.7**	mg/L	5.0	1.4	5		12/13/18 15:10	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/13/18 14:56	16984-48-8	
Sulfate	**388**	mg/L	50.0	12.0	50		12/13/18 15:24	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.3**	mg/L	0.10	0.050	1		11/26/18 13:56	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-4 **Lab ID: 60287288003** Collected: 11/19/18 14:25 Received: 11/20/18 04:15 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								
Barium	**200**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:35	7440-39-3	
Boron	**9630**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:35	7440-42-8	
Calcium	**179000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:35	7440-70-2	
Iron	**26900**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:35	7439-89-6	
Lithium	**23.3**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:35	7439-93-2	
Magnesium	**49000**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:35	7439-95-4	
Manganese	**780**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:35	7439-96-5	
Molybdenum	**51.1**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:35	7439-98-7	
Potassium	**6160**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:35	7440-09-7	
Sodium	**46400**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:35	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**14.8**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:31	7440-38-2	
Chromium	**0.25J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:31	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**252**	mg/L	20.0	4.9	1		11/29/18 13:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**895**	mg/L	5.0	5.0	1		11/21/18 14:50		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**8.4**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**18.5**	mg/L	1.0	0.060	5		11/21/18 15:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**51.1**	mg/L	5.0	1.4	5		12/13/18 16:21	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/13/18 16:07	16984-48-8	
Sulfate	**483**	mg/L	50.0	12.0	50		12/14/18 10:05	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.0**	mg/L	0.10	0.050	1		11/26/18 13:57	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-5 **Lab ID: 60287288004** Collected: 11/19/18 15:30 Received: 11/20/18 04:15 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								
Barium	**195**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:37	7440-39-3	
Boron	**7040**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:37	7440-42-8	
Calcium	**137000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:37	7440-70-2	
Iron	**13800**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:37	7439-89-6	
Lithium	**18.1**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:37	7439-93-2	
Magnesium	**44800**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:37	7439-95-4	
Manganese	**364**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:37	7439-96-5	
Molybdenum	**101**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:37	7439-98-7	
Potassium	**4790**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:37	7440-09-7	
Sodium	**40500**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:37	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.8**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:33	7440-38-2	
Chromium	**0.14J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:33	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**336**	mg/L	20.0	4.9	1		11/29/18 14:03		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**817**	mg/L	5.0	5.0	1		11/21/18 14:50		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**10.7**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**3.1**	mg/L	0.20	0.012	1		11/21/18 15:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**43.9**	mg/L	5.0	1.4	5		12/13/18 17:42	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.19	1		12/13/18 16:50	16984-48-8	
Sulfate	**277**	mg/L	50.0	12.0	50		12/14/18 10:47	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.1**	mg/L	0.10	0.050	1		11/26/18 13:58	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-6 **Lab ID: 60287288005** Collected: 11/19/18 12:35 Received: 11/20/18 04:15 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								
Barium	**49.4**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:40	7440-39-3	
Boron	**12800**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:40	7440-42-8	
Calcium	**358000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:40	7440-70-2	
Iron	**6170**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:40	7439-89-6	
Lithium	**131**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:40	7439-93-2	
Magnesium	**26800**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:40	7439-95-4	
Manganese	**1400**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:40	7439-96-5	
Molybdenum	**135**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:40	7439-98-7	
Potassium	**13600**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:40	7440-09-7	
Sodium	**23400**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:40	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.9**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:34	7440-38-2	
Chromium	**0.12J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:34	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**474**	mg/L	20.0	4.9	1		11/29/18 14:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1430**	mg/L	5.0	5.0	1		11/21/18 14:50		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**3.4**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**2.8**	mg/L	0.20	0.012	1		11/21/18 12:17		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**18.0**	mg/L	1.0	0.29	1		12/13/18 18:11	16887-00-6	
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/13/18 18:11	16984-48-8	
Sulfate	**632**	mg/L	50.0	12.0	50		12/14/18 11:01	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:00	7723-14-0	

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-7 **Lab ID: 60287288006** Collected: 11/19/18 13:25 Received: 11/20/18 04:15 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								
Barium	**37.9**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:42	7440-39-3	
Boron	**23700**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:42	7440-42-8	
Calcium	**390000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:42	7440-70-2	
Iron	**29.4J**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:42	7439-89-6	
Lithium	**48.6**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:42	7439-93-2	
Magnesium	**30600**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:42	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:42	7439-96-5	
Molybdenum	**461**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:42	7439-98-7	
Potassium	**17800**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:42	7440-09-7	
Sodium	**103000**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:42	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.6**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:36	7440-38-2	
Chromium	**0.25J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:36	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**191**	mg/L	20.0	4.9	1		11/29/18 14:24		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1960**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.029J**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/21/18 15:39		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**54.4**	mg/L	10.0	2.9	10		12/13/18 19:36	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	0.19	1		12/13/18 18:53	16984-48-8	
Sulfate	**1210**	mg/L	100	24.0	100		12/14/18 13:08	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:01	7723-14-0	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-8 **Lab ID: 60287288007** Collected: 11/19/18 15:00 Received: 11/20/18 04:15 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								
Barium	**168**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:44	7440-39-3	
Boron	**9130**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:44	7440-42-8	
Calcium	**171000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:44	7440-70-2	
Iron	**9640**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:44	7439-89-6	
Lithium	**33.7**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:44	7439-93-2	
Magnesium	**34900**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:44	7439-95-4	
Manganese	**2010**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:44	7439-96-5	
Molybdenum	**183**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:44	7439-98-7	
Potassium	**6350**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:44	7440-09-7	
Sodium	**33600**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:44	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**5.8**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:38	7440-38-2	
Chromium	**0.26J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:38	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**191**	mg/L	20.0	4.9	1		11/29/18 14:28		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**936**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**5.9**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**3.7**	mg/L	0.20	0.012	1		11/21/18 15:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**24.5**	mg/L	2.0	0.58	2		12/13/18 20:18	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.19	1		12/13/18 20:04	16984-48-8	
Sulfate	**470**	mg/L	50.0	12.0	50		12/14/18 11:58	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.38**	mg/L	0.10	0.050	1		11/26/18 14:04	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-BMW-1 **Lab ID: 60287288008** Collected: 11/19/18 15:25 Received: 11/20/18 04:15 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								
Barium	**204**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:46	7440-39-3	
Boron	**468**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:46	7440-42-8	
Calcium	**103000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:46	7440-70-2	
Iron	**199**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:46	7439-89-6	
Lithium	**15.0**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:46	7439-93-2	
Magnesium	**25900**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:46	7439-95-4	
Manganese	**187**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:46	7439-96-5	
Molybdenum	**4.6J**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:46	7439-98-7	
Potassium	**2990**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:46	7440-09-7	
Sodium	**81500**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:46	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.4**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:39	7440-38-2	
Chromium	**0.11J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:39	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**414**	mg/L	20.0	4.9	1		11/29/18 14:34		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**640**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**2.0**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/21/18 15:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**137**	mg/L	10.0	2.9	10		12/12/18 20:02	16887-00-6	
Fluoride	**0.43**	mg/L	0.20	0.19	1		12/12/18 19:46	16984-48-8	
Sulfate	**63.4**	mg/L	10.0	2.4	10		12/12/18 20:02	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**0.062J**	mg/L	0.10	0.050	1		11/26/18 14:05	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-BMW-2 **Lab ID: 60287288009** Collected: 11/19/18 11:20 Received: 11/20/18 04:15 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								
Barium	**524**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 17:49	7440-39-3	
Boron	**98.0J**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 17:49	7440-42-8	
Calcium	**98000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 17:49	7440-70-2	
Iron	**14000**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 17:49	7439-89-6	
Lithium	**6.5J**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 17:49	7439-93-2	
Magnesium	**33200**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 17:49	7439-95-4	
Manganese	**4220**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 17:49	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 17:49	7439-98-7	
Potassium	**1280**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 17:49	7440-09-7	
Sodium	**18700**	ug/L	500	157	1	12/03/18 16:08	12/04/18 17:49	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**1.1**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:44	7440-38-2	
Chromium	**0.45J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:44	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**420**	mg/L	20.0	4.9	1		11/29/18 14:40		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**481**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**10.9**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**3.1**	mg/L	0.20	0.012	1		11/21/18 12:17		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**12.8**	mg/L	1.0	0.29	1		12/12/18 20:34	16887-00-6	
Fluoride	**0.35**	mg/L	0.20	0.19	1		12/12/18 20:34	16984-48-8	
Sulfate	**25.7**	mg/L	2.0	0.48	2		12/14/18 12:13	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.6**	mg/L	0.10	0.050	1		11/26/18 14:06	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-DUP-1 **Lab ID: 60287288011** Collected: 11/19/18 09:55 Received: 11/20/18 04:15 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								
Barium	**50.0**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 18:02	7440-39-3	
Boron	**12800**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 18:02	7440-42-8	
Calcium	**357000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 18:02	7440-70-2	
Iron	**6150**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 18:02	7439-89-6	
Lithium	**134**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 18:02	7439-93-2	
Magnesium	**26800**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 18:02	7439-95-4	
Manganese	**1400**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 18:02	7439-96-5	
Molybdenum	**134**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 18:02	7439-98-7	
Potassium	**13400**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 18:02	7440-09-7	
Sodium	**23200**	ug/L	500	157	1	12/03/18 16:08	12/04/18 18:02	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.9**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:49	7440-38-2	
Chromium	**0.41J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:49	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**474**	mg/L	20.0	4.9	1		11/29/18 15:00		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1500**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**3.4**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**2.8**	mg/L	0.20	0.012	1		11/21/18 12:15		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**17.5**	mg/L	1.0	0.29	1		12/12/18 21:54	16887-00-6	
Fluoride	**0.33**	mg/L	0.20	0.19	1		12/12/18 21:54	16984-48-8	
Sulfate	**612**	mg/L	50.0	12.0	50		12/12/18 22:59	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:10	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-DUP-2 **Lab ID: 60287288012** Collected: 11/19/18 09:55 Received: 11/20/18 04:15 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								
Barium	**39.2**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 18:04	7440-39-3	
Boron	**24600**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 18:04	7440-42-8	
Calcium	**402000**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 18:04	7440-70-2	
Iron	**9.6J**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 18:04	7439-89-6	
Lithium	**51.2**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 18:04	7439-93-2	
Magnesium	**31700**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 18:04	7439-95-4	
Manganese	**0.77J**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 18:04	7439-96-5	
Molybdenum	**477**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 18:04	7439-98-7	
Potassium	**18300**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 18:04	7440-09-7	
Sodium	**106000**	ug/L	500	157	1	12/03/18 16:08	12/04/18 18:04	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**2.5**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:50	7440-38-2	
Chromium	**0.24J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:50	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**200**	mg/L	20.0	4.9	1		11/29/18 15:04		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1990**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0096J**	mg/L	0.050		1		12/06/18 16:38	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/21/18 12:15		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**53.7**	mg/L	10.0	2.9	10		12/12/18 23:31	16887-00-6	
Fluoride	**0.54**	mg/L	0.20	0.19	1		12/12/18 23:15	16984-48-8	
Sulfate	**1220**	mg/L	200	48.0	200		12/14/18 14:47	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:11	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-FB-1 **Lab ID: 60287288013** Collected: 11/19/18 12:40 Received: 11/20/18 04:15 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								
Barium	**<1.5**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 18:06	7440-39-3	
Boron	**77.0J**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 18:06	7440-42-8	
Calcium	**70.1J**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 18:06	7440-70-2	B
Iron	**<6.1**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 18:06	7439-89-6	
Lithium	**5.3J**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 18:06	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 18:06	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 18:06	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 18:06	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 18:06	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	12/03/18 16:08	12/04/18 18:06	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:52	7440-38-2	
Chromium	**0.17J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:52	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/29/18 15:08		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**16.0**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		12/14/18 09:15	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/21/18 12:17		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.32J**	mg/L	1.0	0.29	1		12/12/18 23:47	16887-00-6	B
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/12/18 23:47	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		12/12/18 23:47	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:12	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-FB-2 **Lab ID: 60287288014** Collected: 11/19/18 14:30 Received: 11/20/18 04:15 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								
Barium	**<1.5**	ug/L	5.0	1.5	1	12/03/18 16:08	12/04/18 18:08	7440-39-3	
Boron	**40.0J**	ug/L	100	12.5	1	12/03/18 16:08	12/04/18 18:08	7440-42-8	
Calcium	**<53.5**	ug/L	200	53.5	1	12/03/18 16:08	12/04/18 18:08	7440-70-2	
Iron	**<6.1**	ug/L	50.0	6.1	1	12/03/18 16:08	12/04/18 18:08	7439-89-6	
Lithium	**<4.6**	ug/L	10.0	4.6	1	12/03/18 16:08	12/04/18 18:08	7439-93-2	
Magnesium	**<14.0**	ug/L	50.0	14.0	1	12/03/18 16:08	12/04/18 18:08	7439-95-4	
Manganese	**<0.73**	ug/L	5.0	0.73	1	12/03/18 16:08	12/04/18 18:08	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	12/03/18 16:08	12/04/18 18:08	7439-98-7	
Potassium	**<79.3**	ug/L	500	79.3	1	12/03/18 16:08	12/04/18 18:08	7440-09-7	
Sodium	**<157**	ug/L	500	157	1	12/03/18 16:08	12/04/18 18:08	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**<0.065**	ug/L	1.0	0.065	1	12/03/18 15:40	12/04/18 12:54	7440-38-2	
Chromium	**0.098J**	ug/L	1.0	0.078	1	12/03/18 15:40	12/04/18 12:54	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**<4.9**	mg/L	20.0	4.9	1		11/29/18 15:20		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**6.0**	mg/L	5.0	5.0	1		11/26/18 09:06		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**0.0J**	mg/L	0.050		1		12/14/18 09:15	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**<0.012**	mg/L	0.20	0.012	1		11/21/18 15:43		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**0.32J**	mg/L	1.0	0.29	1		12/13/18 00:03	16887-00-6	B
Fluoride	**<0.19**	mg/L	0.20	0.19	1		12/13/18 00:03	16984-48-8	
Sulfate	**<0.24**	mg/L	1.0	0.24	1		12/13/18 00:03	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**<0.050**	mg/L	0.10	0.050	1		11/26/18 14:13	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-1 **Lab ID: 60287288017** Collected: 11/20/18 15:05 Received: 11/21/18 03:30 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	**370**	ug/L	5.0	1.5	1	12/04/18 12:45	12/05/18 14:01	7440-39-3	
Boron	**52.3J**	ug/L	100	12.5	1	12/04/18 12:45	12/05/18 14:01	7440-42-8	
Calcium	**132000**	ug/L	200	53.5	1	12/04/18 12:45	12/05/18 14:01	7440-70-2	
Iron	**15200**	ug/L	50.0	6.1	1	12/04/18 12:45	12/05/18 14:01	7439-89-6	
Lithium	**5.3J**	ug/L	10.0	4.6	1	12/04/18 12:45	12/05/18 14:56	7439-93-2	
Magnesium	**42800**	ug/L	50.0	14.0	1	12/04/18 12:45	12/05/18 14:01	7439-95-4	
Manganese	**1910**	ug/L	5.0	0.73	1	12/04/18 12:45	12/05/18 14:01	7439-96-5	
Molybdenum	**<0.90**	ug/L	20.0	0.90	1	12/04/18 12:45	12/05/18 14:01	7439-98-7	
Potassium	**1520**	ug/L	500	79.3	1	12/04/18 12:45	12/05/18 14:01	7440-09-7	
Sodium	**29400**	ug/L	500	157	1	12/04/18 12:45	12/05/18 14:01	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8								
Arsenic	**0.68J**	ug/L	1.0	0.065	1	12/05/18 10:24	12/05/18 16:01	7440-38-2	
Chromium	**0.36J**	ug/L	1.0	0.078	1	12/05/18 10:24	12/05/18 16:01	7440-47-3	
2320B Alkalinity	Analytical Method: SM 2320B								
Alkalinity, Total as CaCO3	**394**	mg/L	20.0	4.9	1		12/03/18 16:51		
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**628**	mg/L	5.0	5.0	1		11/26/18 09:09		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4								
Iron, Ferric	**10.0**	mg/L	0.050		1		12/14/18 09:15	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4								
Iron, Ferrous	**5.2**	mg/L	0.20	0.012	1		11/21/18 15:55		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**43.1**	mg/L	10.0	2.9	10		12/13/18 01:07	16887-00-6	
Fluoride	**0.30**	mg/L	0.20	0.19	1		12/13/18 00:51	16984-48-8	
Sulfate	**103**	mg/L	10.0	2.4	10		12/13/18 01:07	14808-79-8	
365.4 Total Phosphorus	Analytical Method: EPA 365.4								
Phosphorus	**1.3**	mg/L	0.10	0.050	1		11/28/18 11:51	7723-14-0	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 558137 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 2289783 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	12/04/18 17:22	
Boron	ug/L	<12.5	100	12.5	12/04/18 17:22	
Calcium	ug/L	54.6J	200	53.5	12/04/18 17:22	
Iron	ug/L	<6.1	50.0	6.1	12/04/18 17:22	
Lithium	ug/L	<4.6	10.0	4.6	12/04/18 17:22	
Magnesium	ug/L	<14.0	50.0	14.0	12/04/18 17:22	
Manganese	ug/L	<0.73	5.0	0.73	12/04/18 17:22	
Molybdenum	ug/L	<0.90	20.0	0.90	12/04/18 17:22	
Potassium	ug/L	<79.3	500	79.3	12/04/18 17:22	
Sodium	ug/L	<157	500	157	12/04/18 17:22	

LABORATORY CONTROL SAMPLE: 2289784

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	951	95	85-115	
Boron	ug/L	1000	952	95	85-115	
Calcium	ug/L	10000	9540	95	85-115	
Iron	ug/L	10000	9260	93	85-115	
Lithium	ug/L	1000	940	94	85-115	
Magnesium	ug/L	10000	9620	96	85-115	
Manganese	ug/L	1000	961	96	85-115	
Molybdenum	ug/L	1000	976	98	85-115	
Potassium	ug/L	10000	9540	95	85-115	
Sodium	ug/L	10000	9810	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289785 2289786

Parameter	Units	60287288010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	147	1000	1000	1120	1080	98	94	70-130	3	20	
Boron	ug/L	1980	1000	1000	2990	2860	101	88	70-130	5	20	
Calcium	ug/L	190000	10000	10000	203000	194000	132	43	70-130	4	20	M1
Iron	ug/L	16300	10000	10000	25800	24800	96	85	70-130	4	20	
Lithium	ug/L	36.0	1000	1000	1010	976	98	94	70-130	4	20	
Magnesium	ug/L	47700	10000	10000	57900	55200	102	75	70-130	5	20	
Manganese	ug/L	704	1000	1000	1680	1610	97	91	70-130	4	20	
Molybdenum	ug/L	4.3J	1000	1000	1010	974	100	97	70-130	3	20	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2289785 2289786

Parameter	Units	60287288010 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Potassium	ug/L	7780	10000	10000	17800	17100	100	94	70-130	4	20	
Sodium	ug/L	49000	10000	10000	59800	57400	109	85	70-130	4	20	

MATRIX SPIKE SAMPLE: 2289787

Parameter	Units	60287289001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	58.8	1000	1020	97	70-130	
Boron	ug/L	2550	1000	3510	96	70-130	
Calcium	ug/L	217000	10000	222000	44	70-130	M1
Iron	ug/L	15900	10000	24800	89	70-130	
Lithium	ug/L	42.7	1000	1000	96	70-130	
Magnesium	ug/L	56200	10000	65000	88	70-130	
Manganese	ug/L	578	1000	1530	95	70-130	
Molybdenum	ug/L	6.2J	1000	1000	100	70-130	
Potassium	ug/L	7890	10000	17700	98	70-130	
Sodium	ug/L	167000	10000	173000	62	70-130	M1

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 558212
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60287288017

METHOD BLANK: 2290148 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.5	5.0	1.5	12/05/18 13:33	
Boron	ug/L	<12.5	100	12.5	12/05/18 13:33	
Calcium	ug/L	<53.5	200	53.5	12/05/18 13:33	
Iron	ug/L	<6.1	50.0	6.1	12/05/18 13:33	
Lithium	ug/L	<4.6	10.0	4.6	12/05/18 14:28	
Magnesium	ug/L	<14.0	50.0	14.0	12/05/18 13:33	
Manganese	ug/L	<0.73	5.0	0.73	12/05/18 13:33	
Molybdenum	ug/L	<0.90	20.0	0.90	12/05/18 13:33	
Potassium	ug/L	<79.3	500	79.3	12/05/18 13:33	
Sodium	ug/L	<157	500	157	12/05/18 13:33	

LABORATORY CONTROL SAMPLE: 2290149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	1010	101	85-115	
Boron	ug/L	1000	985	98	85-115	
Calcium	ug/L	10000	10000	100	85-115	
Iron	ug/L	10000	9940	99	85-115	
Lithium	ug/L	1000	919	92	85-115	
Magnesium	ug/L	10000	10000	100	85-115	
Manganese	ug/L	1000	996	100	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	10100	101	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2290150 2290151

Parameter	Units	60287289003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	386	1000	1000	1380	1370	100	99	70-130	1	20	
Boron	ug/L	640	1000	1000	1610	1640	97	100	70-130	1	20	
Calcium	ug/L	77100	10000	10000	86200	85000	91	80	70-130	1	20	
Iron	ug/L	8420	10000	10000	17900	17700	95	93	70-130	1	20	
Lithium	ug/L	17.2	1000	1000	923	911	91	89	70-130	1	20	
Magnesium	ug/L	31300	10000	10000	41200	41500	98	102	70-130	1	20	
Manganese	ug/L	110	1000	1000	1110	1120	100	101	70-130	1	20	
Molybdenum	ug/L	3.1J	1000	1000	1020	1030	101	103	70-130	1	20	
Potassium	ug/L	3160	10000	10000	13600	13500	105	103	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2290150 2290151

Parameter	Units	60287289003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sodium	ug/L	44900	10000	10000	54600	54300	98	94	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 558139 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 2289794 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	12/04/18 12:25	
Chromium	ug/L	<0.078	1.0	0.078	12/04/18 12:25	

LABORATORY CONTROL SAMPLE: 2289795

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	39.5	99	85-115	
Chromium	ug/L	40	39.8	99	85-115	

MATRIX SPIKE SAMPLE: 2289796

Parameter	Units	60287288010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	11.7	40	51.8	100	70-130	
Chromium	ug/L	0.23J	40	43.8	109	70-130	

MATRIX SPIKE SAMPLE: 2289797

Parameter	Units	60287289001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	3.8	40	43.6	99	70-130	
Chromium	ug/L	0.17J	40	42.2	105	70-130	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 558318 Analysis Method: EPA 200.8
QC Batch Method: EPA 200.8 Analysis Description: 200.8 MET
Associated Lab Samples: 60287288017

METHOD BLANK: 2290488 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	<0.065	1.0	0.065	12/05/18 15:42	
Chromium	ug/L	<0.078	1.0	0.078	12/05/18 15:42	

LABORATORY CONTROL SAMPLE: 2290489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	40	37.9	95	85-115	
Chromium	ug/L	40	38.8	97	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2290490 2290491

Parameter	Units	60287167001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.0	40	40	38.5	38.3	94	93	70-130	1	20	
Chromium	ug/L	<0.078	40	40	37.7	37.7	94	94	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 557524 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 2287246 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	11/29/18 13:19	

LABORATORY CONTROL SAMPLE: 2287247

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	501	100	90-110	

SAMPLE DUPLICATE: 2287252

Parameter	Units	60287288010 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	525	543	3	10	

SAMPLE DUPLICATE: 2287253

Parameter	Units	60287289001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	403	406	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 557603 Analysis Method: SM 2320B
QC Batch Method: SM 2320B Analysis Description: 2320B Alkalinity
Associated Lab Samples: 60287288017

METHOD BLANK: 2287625 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<4.9	20.0	4.9	12/03/18 16:29	

LABORATORY CONTROL SAMPLE: 2287626

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	484	97	90-110	

SAMPLE DUPLICATE: 2287630

Parameter	Units	60287288017 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	394	396	1	10	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556380 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005

METHOD BLANK: 2282802 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/21/18 14:48	

LABORATORY CONTROL SAMPLE: 2282803

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	954	95	80-120	

SAMPLE DUPLICATE: 2282804

Parameter	Units	60287115001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	264	248	6	10	

SAMPLE DUPLICATE: 2282805

Parameter	Units	60287156005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	455	464	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556629 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 2283821 Matrix: Water
Associated Lab Samples: 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/26/18 09:06	

LABORATORY CONTROL SAMPLE: 2283822

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	966	97	80-120	

SAMPLE DUPLICATE: 2283824

Parameter	Units	60287297001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	864	843	2	10	

SAMPLE DUPLICATE: 2283825

Parameter	Units	60287288010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	941	947	1	10	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556732 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60287288017

METHOD BLANK: 2284609 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/26/18 09:06	

LABORATORY CONTROL SAMPLE: 2284610

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	983	98	80-120	

SAMPLE DUPLICATE: 2284611

Parameter	Units	60287327002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1010	971	4	10	

SAMPLE DUPLICATE: 2284612

Parameter	Units	60287289004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	388	404	4	10	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556509 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60287288001, 60287288002, 60287288005, 60287288009, 60287288011, 60287288012, 60287288013

METHOD BLANK: 2283283 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288005, 60287288009, 60287288011, 60287288012, 60287288013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/21/18 12:09	H6

LABORATORY CONTROL SAMPLE: 2283284

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

SAMPLE DUPLICATE: 2283286

Parameter	Units	60287289002 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.012	<0.012		20	H6

SAMPLE DUPLICATE: 2283287

Parameter	Units	60287289001 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	2.1	2.1	2	20	H6

SAMPLE DUPLICATE: 2283288

Parameter	Units	60287288010 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	2.4	2.5	4	20	H6

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556555 Analysis Method: SM 3500-Fe B#4
QC Batch Method: SM 3500-Fe B#4 Analysis Description: Iron, Ferrous
Associated Lab Samples: 60287288003, 60287288004, 60287288006, 60287288007, 60287288008, 60287288014, 60287288017

METHOD BLANK: 2283493 Matrix: Water
Associated Lab Samples: 60287288003, 60287288004, 60287288006, 60287288007, 60287288008, 60287288014, 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.012	0.20	0.012	11/21/18 15:26	H6

LABORATORY CONTROL SAMPLE: 2283494

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

SAMPLE DUPLICATE: 2283495

Parameter	Units	60287288006 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 MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 559762 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014, 60287288017

METHOD BLANK: 2297044 Matrix: Water
Associated Lab Samples: 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014, 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.33J	1.0	0.29	12/12/18 14:28	
Fluoride	mg/L	<0.19	0.20	0.19	12/12/18 14:28	
Sulfate	mg/L	<0.24	1.0	0.24	12/12/18 14:28	

LABORATORY CONTROL SAMPLE: 2297045

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	10	9.9	99	90-110	
Fluoride	mg/L	5	4.7	94	90-110	
Sulfate	mg/L	10	9.6	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2297046 2297047

Parameter	Units	60287946001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	155	250	250	387	409	93	102	90-110	6	15	
Fluoride	mg/L	ND	125	125	116	123	93	99	90-110	6	15	
Sulfate	mg/L	60.7	250	250	294	300	93	96	90-110	2	15	

MATRIX SPIKE SAMPLE: 2297048

Parameter	Units	60287288010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	63.1	100	158	95	90-110	
Fluoride	mg/L	0.30	2.5	5.1	193	90-110	M1
Sulfate	mg/L	200	100	299	99	90-110	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 559950 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007

METHOD BLANK: 2297959 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288009, 60287288012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.29	1.0	0.29	12/13/18 13:45	
Fluoride	mg/L	<0.19	0.20	0.19	12/13/18 13:45	
Sulfate	mg/L	<0.24	1.0	0.24	12/13/18 13:45	

LABORATORY CONTROL SAMPLE: 2297960

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	2.3	94	90-110	
Sulfate	mg/L	5	5.1	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2297961 2297962

Parameter	Units	60288283005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	230	100	100	343	344	113	114	90-110	0	15	M1

MATRIX SPIKE SAMPLE: 2297963

Parameter	Units	60288062018 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	28.5	10	40.6	121	90-110	E,M1

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 560175 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288009, 60287288012

METHOD BLANK: 2299101 Matrix: Water
Associated Lab Samples: 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288009, 60287288012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	0.24	12/14/18 09:35	

LABORATORY CONTROL SAMPLE: 2299102

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: 2299103 2299104

Parameter	Units	60287288003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	483	250	250	748	749	106	106	90-110	0	15	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 556707 Analysis Method: EPA 365.4
QC Batch Method: EPA 365.4 Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 2284390 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/26/18 13:42	

LABORATORY CONTROL SAMPLE: 2284391

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	2	1.9	95	90-110	

MATRIX SPIKE SAMPLE: 2284393

Parameter	Units	60287288010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.69	2	2.5	91	90-110	

MATRIX SPIKE SAMPLE: 2284394

Parameter	Units	60287289001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.68	2	2.5	91	90-110	

SAMPLE DUPLICATE: 2284392

Parameter	Units	60287443001 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	1.4	1.4	3	10	

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QUALITY CONTROL DATA

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 557188
QC Batch Method: EPA 365.4
Analysis Method: EPA 365.4
Analysis Description: 365.4 Phosphorus
Associated Lab Samples: 60287288017

METHOD BLANK: 2285943 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Phosphorus	mg/L	<0.050	0.10	0.050	11/28/18 11:17	

LABORATORY CONTROL SAMPLE: 2285944

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

MATRIX SPIKE SAMPLE: 2285945

Parameter	Units	60285327001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	8.8	2	15.6	341	90-110	M1

MATRIX SPIKE SAMPLE: 2285947

Parameter	Units	60287428005 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Phosphorus	mg/L	0.50	2	2.4	96	90-110	

SAMPLE DUPLICATE: 2285946

Parameter	Units	60287380002 Result	Dup Result	RPD	Max RPD	Qualifiers
Phosphorus	mg/L	9.2	9.7	6	10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-2 **Lab ID: 60287288001** Collected: 11/19/18 10:25 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.690 ± 0.451 (0.462) C:NA T:90%**	pCi/L	12/13/18 11:24	13982-63-3	
Radium-228	EPA 904.0	**1.47 ± 0.505 (0.706) C:80% T:87%**	pCi/L	12/12/18 16:25	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-3 **Lab ID: 60287288002** Collected: 11/19/18 12:45 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.09 ± 0.616 (0.691) C:NA T:90%**	pCi/L	12/13/18 11:24	13982-63-3	
Radium-228	EPA 904.0	**1.32 ± 0.486 (0.711) C:77% T:84%**	pCi/L	12/12/18 16:25	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-4 **Lab ID: 60287288003** Collected: 11/19/18 14:25 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.438 ± 0.508 (0.820) C:NA T:91%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**0.811 ± 0.334 (0.494) C:78% T:93%**	pCi/L	12/12/18 16:25	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-5 **Lab ID: 60287288004** Collected: 11/19/18 15:30 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.259 ± 0.312 (0.476) C:NA T:92%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**1.14 ± 0.444 (0.646) C:74% T:83%**	pCi/L	12/12/18 16:25	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-6 **Lab ID: 60287288005** Collected: 11/19/18 12:35 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.354 ± 0.368 (0.548) C:NA T:96%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**0.621 ± 0.356 (0.641) C:78% T:87%**	pCi/L	12/12/18 16:25	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-7 **Lab ID: 60287288006** Collected: 11/19/18 13:25 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.534 ± 0.493 (0.718) C:NA T:87%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**0.842 ± 0.388 (0.634) C:81% T:82%**	pCi/L	12/12/18 16:25	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-8 **Lab ID: 60287288007** Collected: 11/19/18 15:00 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.464 ± 0.506 (0.796) C:NA T:90%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**2.01 ± 0.558 (0.535) C:77% T:89%**	pCi/L	12/12/18 16:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-BMW-1 **Lab ID: 60287288008** Collected: 11/19/18 15:25 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.396 ± 0.412 (0.613) C:NA T:85%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**2.28 ± 0.669 (0.780) C:69% T:87%**	pCi/L	12/12/18 16:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-BMW-2 **Lab ID: 60287288009** Collected: 11/19/18 11:20 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.917 ± 0.608 (0.801) C:NA T:93%**	pCi/L	12/13/18 12:03	13982-63-3	
Radium-228	EPA 904.0	**0.690 ± 0.358 (0.619) C:78% T:91%**	pCi/L	12/12/18 16:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-DUP-1 **Lab ID: 60287288011** Collected: 11/19/18 09:55 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.613 ± 0.487 (0.633) C:NA T:87%**	pCi/L	12/13/18 12:17	13982-63-3	
Radium-228	EPA 904.0	**0.840 ± 0.364 (0.556) C:76% T:87%**	pCi/L	12/12/18 16:26	15262-20-1	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-DUP-2 **Lab ID: 60287288012** Collected: 11/19/18 09:55 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.496 ± 0.459 (0.668) C:NA T:93%**	pCi/L	12/13/18 12:17	13982-63-3	
Radium-228	EPA 904.0	**0.338 ± 0.303 (0.605) C:77% T:87%**	pCi/L	12/12/18 16:26	15262-20-1	

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-FB-1 **Lab ID: 60287288013** Collected: 11/19/18 12:40 Received: 11/20/18 04:15 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 (0.458) C:NA T:96%**	pCi/L	12/13/18 12:17	13982-63-3	
Radium-228	EPA 904.0	**1.94 ± 0.599 (0.732) C:79% T:76%**	pCi/L	12/12/18 16:26	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-FB-2 **Lab ID: 60287288014** Collected: 11/19/18 14:30 Received: 11/20/18 04:15 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.257 ± 0.357 (0.596) C:NA T:96%**	pCi/L	12/13/18 12:17	13982-63-3	
Radium-228	EPA 904.0	**0.409 ± 0.394 (0.807) C:77% T:76%**	pCi/L	12/12/18 16:26	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Sample: M-MW-1 **Lab ID: 60287288017** Collected: 11/20/18 15:05 Received: 11/21/18 03:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.09 ± 0.548 (0.448) C:NA T:95%**	pCi/L	12/13/18 22:24	13982-63-3	
Radium-228	EPA 904.0	**0.573 ± 0.309 (0.535) C:75% T:92%**	pCi/L	12/13/18 12:52	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 321904 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 1569446 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.545 ± 0.433 (0.563) C:NA T:94%	pCi/L	12/13/18 11:24	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 322725 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60287288017

METHOD BLANK: 1572958 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.839 ± 0.342 (0.501) C:77% T:85%	pCi/L	12/13/18 12:52	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 321906 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

METHOD BLANK: 1569449 Matrix: Water
Associated Lab Samples: 60287288001, 60287288002, 60287288003, 60287288004, 60287288005, 60287288006, 60287288007, 60287288008, 60287288009, 60287288011, 60287288012, 60287288013, 60287288014

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.660 ± 0.402 (0.736) C:82% T:72%	pCi/L	12/12/18 16:25	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

QC Batch: 322681 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60287288017

METHOD BLANK: 1572864 Matrix: Water
Associated Lab Samples: 60287288017

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.200 ± 0.433 (0.799) C:NA T:83%	pCi/L	12/13/18 21:55	

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 MERAMEC MEC
Pace Project No.: 60287288

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

B	Analyte was detected in the associated method blank.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287288001	M-MW-2	EPA 200.7	558137	EPA 200.7	558173
60287288002	M-MW-3	EPA 200.7	558137	EPA 200.7	558173
60287288003	M-MW-4	EPA 200.7	558137	EPA 200.7	558173
60287288004	M-MW-5	EPA 200.7	558137	EPA 200.7	558173
60287288005	M-MW-6	EPA 200.7	558137	EPA 200.7	558173
60287288006	M-MW-7	EPA 200.7	558137	EPA 200.7	558173
60287288007	M-MW-8	EPA 200.7	558137	EPA 200.7	558173
60287288008	M-BMW-1	EPA 200.7	558137	EPA 200.7	558173
60287288009	M-BMW-2	EPA 200.7	558137	EPA 200.7	558173
60287288011	M-DUP-1	EPA 200.7	558137	EPA 200.7	558173
60287288012	M-DUP-2	EPA 200.7	558137	EPA 200.7	558173
60287288013	M-FB-1	EPA 200.7	558137	EPA 200.7	558173
60287288014	M-FB-2	EPA 200.7	558137	EPA 200.7	558173
60287288017	M-MW-1	EPA 200.7	558212	EPA 200.7	558388
60287288001	M-MW-2	EPA 200.8	558139	EPA 200.8	558167
60287288002	M-MW-3	EPA 200.8	558139	EPA 200.8	558167
60287288003	M-MW-4	EPA 200.8	558139	EPA 200.8	558167
60287288004	M-MW-5	EPA 200.8	558139	EPA 200.8	558167
60287288005	M-MW-6	EPA 200.8	558139	EPA 200.8	558167
60287288006	M-MW-7	EPA 200.8	558139	EPA 200.8	558167
60287288007	M-MW-8	EPA 200.8	558139	EPA 200.8	558167
60287288008	M-BMW-1	EPA 200.8	558139	EPA 200.8	558167
60287288009	M-BMW-2	EPA 200.8	558139	EPA 200.8	558167
60287288011	M-DUP-1	EPA 200.8	558139	EPA 200.8	558167
60287288012	M-DUP-2	EPA 200.8	558139	EPA 200.8	558167
60287288013	M-FB-1	EPA 200.8	558139	EPA 200.8	558167
60287288014	M-FB-2	EPA 200.8	558139	EPA 200.8	558167
60287288017	M-MW-1	EPA 200.8	558318	EPA 200.8	558523
60287288001	M-MW-2	EPA 903.1	321904		
60287288002	M-MW-3	EPA 903.1	321904		
60287288003	M-MW-4	EPA 903.1	321904		
60287288004	M-MW-5	EPA 903.1	321904		
60287288005	M-MW-6	EPA 903.1	321904		
60287288006	M-MW-7	EPA 903.1	321904		
60287288007	M-MW-8	EPA 903.1	321904		
60287288008	M-BMW-1	EPA 903.1	321904		
60287288009	M-BMW-2	EPA 903.1	321904		
60287288011	M-DUP-1	EPA 903.1	321904		
60287288012	M-DUP-2	EPA 903.1	321904		
60287288013	M-FB-1	EPA 903.1	321904		
60287288014	M-FB-2	EPA 903.1	321904		
60287288017	M-MW-1	EPA 903.1	322681		
60287288001	M-MW-2	EPA 904.0	321906		
60287288002	M-MW-3	EPA 904.0	321906		
60287288003	M-MW-4	EPA 904.0	321906		
60287288004	M-MW-5	EPA 904.0	321906		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287288005	**M-MW-6**	EPA 904.0	321906		
60287288006	**M-MW-7**	EPA 904.0	321906		
60287288007	**M-MW-8**	EPA 904.0	321906		
60287288008	**M-BMW-1**	EPA 904.0	321906		
60287288009	**M-BMW-2**	EPA 904.0	321906		
60287288011	**M-DUP-1**	EPA 904.0	321906		
60287288012	**M-DUP-2**	EPA 904.0	321906		
60287288013	**M-FB-1**	EPA 904.0	321906		
60287288014	**M-FB-2**	EPA 904.0	321906		
60287288017	**M-MW-1**	EPA 904.0	322725		
60287288001	**M-MW-2**	SM 2320B	557524		
60287288002	**M-MW-3**	SM 2320B	557524		
60287288003	**M-MW-4**	SM 2320B	557524		
60287288004	**M-MW-5**	SM 2320B	557524		
60287288005	**M-MW-6**	SM 2320B	557524		
60287288006	**M-MW-7**	SM 2320B	557524		
60287288007	**M-MW-8**	SM 2320B	557524		
60287288008	**M-BMW-1**	SM 2320B	557524		
60287288009	**M-BMW-2**	SM 2320B	557524		
60287288011	**M-DUP-1**	SM 2320B	557524		
60287288012	**M-DUP-2**	SM 2320B	557524		
60287288013	**M-FB-1**	SM 2320B	557524		
60287288014	**M-FB-2**	SM 2320B	557524		
60287288017	**M-MW-1**	SM 2320B	557603		
60287288001	**M-MW-2**	SM 2540C	556380		
60287288002	**M-MW-3**	SM 2540C	556380		
60287288003	**M-MW-4**	SM 2540C	556380		
60287288004	**M-MW-5**	SM 2540C	556380		
60287288005	**M-MW-6**	SM 2540C	556380		
60287288006	**M-MW-7**	SM 2540C	556629		
60287288007	**M-MW-8**	SM 2540C	556629		
60287288008	**M-BMW-1**	SM 2540C	556629		
60287288009	**M-BMW-2**	SM 2540C	556629		
60287288011	**M-DUP-1**	SM 2540C	556629		
60287288012	**M-DUP-2**	SM 2540C	556629		
60287288013	**M-FB-1**	SM 2540C	556629		
60287288014	**M-FB-2**	SM 2540C	556629		
60287288017	**M-MW-1**	SM 2540C	556732		
60287288001	**M-MW-2**	SM 3500-Fe B#4	558862		
60287288002	**M-MW-3**	SM 3500-Fe B#4	558862		
60287288003	**M-MW-4**	SM 3500-Fe B#4	558862		
60287288004	**M-MW-5**	SM 3500-Fe B#4	558862		
60287288005	**M-MW-6**	SM 3500-Fe B#4	558862		
60287288006	**M-MW-7**	SM 3500-Fe B#4	558862		
60287288007	**M-MW-8**	SM 3500-Fe B#4	558862		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287288008	**M-BMW-1**	SM 3500-Fe B#4	558862		
60287288009	**M-BMW-2**	SM 3500-Fe B#4	558862		
60287288011	**M-DUP-1**	SM 3500-Fe B#4	558862		
60287288012	**M-DUP-2**	SM 3500-Fe B#4	558862		
60287288013	**M-FB-1**	SM 3500-Fe B#4	560161		
60287288014	**M-FB-2**	SM 3500-Fe B#4	560161		
60287288017	**M-MW-1**	SM 3500-Fe B#4	560161		
60287288001	**M-MW-2**	SM 3500-Fe B#4	556509		
60287288002	**M-MW-3**	SM 3500-Fe B#4	556509		
60287288003	**M-MW-4**	SM 3500-Fe B#4	556555		
60287288004	**M-MW-5**	SM 3500-Fe B#4	556555		
60287288005	**M-MW-6**	SM 3500-Fe B#4	556509		
60287288006	**M-MW-7**	SM 3500-Fe B#4	556555		
60287288007	**M-MW-8**	SM 3500-Fe B#4	556555		
60287288008	**M-BMW-1**	SM 3500-Fe B#4	556555		
60287288009	**M-BMW-2**	SM 3500-Fe B#4	556509		
60287288011	**M-DUP-1**	SM 3500-Fe B#4	556509		
60287288012	**M-DUP-2**	SM 3500-Fe B#4	556509		
60287288013	**M-FB-1**	SM 3500-Fe B#4	556509		
60287288014	**M-FB-2**	SM 3500-Fe B#4	556555		
60287288017	**M-MW-1**	SM 3500-Fe B#4	556555		
60287288001	**M-MW-2**	EPA 300.0	559950		
60287288002	**M-MW-3**	EPA 300.0	559950		
60287288003	**M-MW-4**	EPA 300.0	559950		
60287288003	**M-MW-4**	EPA 300.0	560175		
60287288004	**M-MW-5**	EPA 300.0	559950		
60287288004	**M-MW-5**	EPA 300.0	560175		
60287288005	**M-MW-6**	EPA 300.0	559950		
60287288005	**M-MW-6**	EPA 300.0	560175		
60287288006	**M-MW-7**	EPA 300.0	559950		
60287288006	**M-MW-7**	EPA 300.0	560175		
60287288007	**M-MW-8**	EPA 300.0	559950		
60287288007	**M-MW-8**	EPA 300.0	560175		
60287288008	**M-BMW-1**	EPA 300.0	559762		
60287288009	**M-BMW-2**	EPA 300.0	559762		
60287288009	**M-BMW-2**	EPA 300.0	560175		
60287288011	**M-DUP-1**	EPA 300.0	559762		
60287288012	**M-DUP-2**	EPA 300.0	559762		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN MERAMEC MEC
Pace Project No.: 60287288

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60287288012	**M-DUP-2**	EPA 300.0	560175		
60287288013	**M-FB-1**	EPA 300.0	559762		
60287288014	**M-FB-2**	EPA 300.0	559762		
60287288017	**M-MW-1**	EPA 300.0	559762		
60287288001	**M-MW-2**	EPA 365.4	556707		
60287288002	**M-MW-3**	EPA 365.4	556707		
60287288003	**M-MW-4**	EPA 365.4	556707		
60287288004	**M-MW-5**	EPA 365.4	556707		
60287288005	**M-MW-6**	EPA 365.4	556707		
60287288006	**M-MW-7**	EPA 365.4	556707		
60287288007	**M-MW-8**	EPA 365.4	556707		
60287288008	**M-BMW-1**	EPA 365.4	556707		
60287288009	**M-BMW-2**	EPA 365.4	556707		
60287288011	**M-DUP-1**	EPA 365.4	556707		
60287288012	**M-DUP-2**	EPA 365.4	556707		
60287288013	**M-FB-1**	EPA 365.4	556707		
60287288014	**M-FB-2**	EPA 365.4	556707		
60287288017	**M-MW-1**	EPA 365.4	557188		

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Sample Condition Upon Receipt

WO#: 60287288

60287288

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

Cooler Temperature (°C): **As-read** 4.0 3.7 3.6 / 3.0 2.7 **Corr. Factor** +0.0 **Corrected** 4.0 3.7 3.6 / 3.0 2.7

Temperature should be above freezing to 6°C

JLS

Date and initials of person examining contents: 11/20 JLS

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Jana Chunk 11/20/18

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.

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Page: 1 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, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone: 636-724-9191	Fax: 636-724-9323	Project Name:	Ameren Meramec Energy Center-MEC N&E	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0004C (COC #22)	Pace Profile #:	9285

REGULATORY AGENCY: NPDES / ~~GROUND WATER~~ / DRINKING WATER / UST / RCRA / OTHER ______

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes (MATRIX / CODE): DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

Requested Analysis Filtered (Y/N): N N N N N N

ITEM #	Container notes	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1		M-MW-1	WT	G																						
2	(2)BP2U BP3S BP3N (2)BPIN	M-MW-2	WT	G			11/19/18	1025		6	2	1	3						✓		✓	✓	✓	✓		001
3		M-MW-3	WT	G				1245																		002
4		M-MW-4	WT	G				1425																		003
5		M-MW-5	WT	G				1530																		004
6		M-MW-6	WT	G				1235																		005
7		M-MW-7	WT	G				1325																		006
8		M-MW-8	WT	G				1500																		007
9		M-BMW-1	WT	G				1535																		008
10		M-BMW-2	WT	G				1120		2	2	2	2													009
11		M-AMW-1	WT	G																						
12	(6)BP2U (3)BP3S (3)BP3N (6)BPIN	M-AMW-2	WT	G			11/19/18	0955		18	6	3	9						✓	✓	✓	✓	✓	✓		MS/MSD @ AMW-2 010

Pace Project No.: 60287288

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: Fe, Mg, Mn, K, Na	Golder / [signature]	11/19/18	1810	[signature]	11/20/18	[illegible]	4.0	Y	Y	Y
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Se, Tl							3.7	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/19/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 2 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: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Meramec Energy Center-MEC N&E
Project Number:	153-1406.0004C (COC #22)

Section C Invoice Information:

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

REGULATORY AGENCY

NPDES | GROUND WATER (circled) | DRINKING WATER
UST | RCRA | OTHER

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

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

Requested Analysis Filtered (Y/N): Metals* N; CCR App IV Metals**+Hg N; Alkalinity N; Total Phosphorus N; Ferrous Iron N; Ferric Iron N

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test	Metals*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60287288
1	(2)BPLU BP3S M-DUP-1 BP3N (2)BP1N	WT	G			11/19/18	—		6	2	1	3							✓		✓	✓	✓	✓		011
2	↓ M-DUP-2	WT	G			↓	—		↓	↓	↓	↓							↓		↓	↓	↓	↓		012
3	↓ M-FB-1	WT	G			↓	1240		↓	↓	↓	↓							↓		↓	↓	↓	↓		013
4	↓ M-FB-2	WT	G			↓	1430		↓	↓	↓	↓							↓		↓	↓	↓	↓		014
5		WT	G																							
6		WT	G																							
7		WT	G																							
8		WT	G																							
9		WT	G																							
10		WT	G																							
11		WT	G																							
12		WT	G																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: Fe, Mg, Mn, K, Na	[signature] / Golder	11/19/18	1810	[signature]	11/20/18	0945	3.6	Y	Y	Y
**EPA 200.7: Be, Co, Pb **EPA 200.8: Sb, Cd, Se, Tl							3.0	Y	Y	Y
							2.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/19/18

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CHAIN-OF-CUSTODY / Analytical Request Document

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	Baliwin, 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
Purchase Order No.:	
Project Name:	Ameren Meramec Energy Center-MEC
Project Number:	153-1406.0004B (COC #21)

Section C Invoice Information:

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

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Requested Analysis Filtered (Y/N)	Analysis Test: Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N		
1	M-MW-1	WT	G																						
2	M-MW-2	WT	G			11/19/18	1025		6	2	1	3							✓	✓	✓	✓	✓		
3	M-MW-3	WT	G				1245																		
4	M-MW-4	WT	G				1425																		
5	M-MW-5	WT	G				1530																		
6	M-MW-6	WT	G				1235																		
7	M-MW-7	WT	G				1325																		
8	M-MW-8	WT	G				1500																		
9	M-BMW-1	WT	G				1525																		
10	M-BMW-2	WT	G				1120																		
11	M-AMW-1	WT	G																						
12	M-AMW-2	WT	G			11/19/18	0955		18	6	3	9													MS/MSD @ AMW-2

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: As, Cr	Golder/	11/19/18	1810				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/19/18

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

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

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CHAIN-OF-CUSTODY / Analytical Request Document

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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	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Meramec Energy Center-MEC	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0004B (COC #21)	Pace Profile #:	9285

REGULATORY AGENCY

NPDES / GROUND WATER DRINKING WATER

UST RCRA OTHER _____

Site Location STATE: MO

Section D Required Client Information

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

Valid Matrix Codes

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	M-DUP-1	WT	G			11/9/18	—		6	2	1	3						N	✓	✓	✓	✓	✓		
2	M-DUP-2	WT	G				—											N							
3	M-FB-1	WT	G				1240											N							
4	M-FB-2	WT	G				1430											N							
5		WT	G															N							
6		WT	G															N							
7		WT	G															N							
8		WT	G															N							
9		WT	G															N							
10		WT	G															N							
11		WT	G															N							
12		WT	G															N							

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: As, Cr	Golder/	11/19/18	1810				

SAMPLER NAME AND SIGNATURE			Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Eric Schneider					
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY): 11/19/18				

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Sample Condition Upon Receipt

WO# : 60287288

60287288

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 ☒ Ziplc

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

Cooler Temperature (°C): **As-read** 0.8 **Corr. Factor** +0.2 **Corrected** 1.0

Date and initials of person examining contents: JLS 11-21-18

Temperature should be above freezing to 6°C

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

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

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jann Church 11/21/18 Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
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Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Jeffrey Ingram	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	maddock@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren Meramec Energy Center-MEC	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-1406.0004B (COC #21)	Pace Profile #:	9285

REGULATORY AGENCY

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

Site Location STATE: MO

Section D Required Client Information

Valid Matrix Codes

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

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

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Metals*	Chloride/Fluoride/Sulfate	TDS	Radium 226	Radium 228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Requested Analysis Filtered (Y/N)	N	N	N	N	N		60287258
1	M-MW-1	WT	G			11/20/18	1505		6	2	1	3							✓	✓	✓	✓	✓	2BP1N, 2BP2U, BPJN, BPJS	001
2	M-MW-2	WT	G																						
3	M-MW-3	WT	G																						
4	M-MW-4	WT	G																						
5	M-MW-5	WT	G																						
6	M-MW-6	WT	G																						
7	M-MW-7	WT	G																						
8	M-MW-8	WT	G																						
9	M-BMW-1	WT	G																						
10	M-BMW-2	WT	G																						
11	M-AMW-1	WT	G			11/20/18	1210		6	2	1	3							✓	✓	✓	✓	✓	2BP1N, 2BP2U, BPJN, BPJS	002
12	M-AMW-2	WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: B, Ca, Ba, Li, Mo *EPA 200.8: As, Cr		11/20/18	1640	PACE	11/20/18	1640				
		11/20/18	1700		11-21-18	0930	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 11/20/18

*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

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Page: 1 of 1

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Email To:	maddock@golder.com
Phone:	636-724-9191
Fax:	636-724-9323
Requested Due Date/TAT:	Standard

Section B — Required Project Information:

Report To:	Mark Haddock (mhaddock@golder.com)
Copy To:	Jeffrey Ingram
Purchase Order No.:	
Project Name:	Ameren Meramec Energy Center-MEC N&E
Project Number:	153-1406.0004C (COC #22)

Section C — Invoice Information:

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

REGULATORY AGENCY: NPDES, GROUND WATER (circled), DRINKING WATER, UST, RCRA, OTHER ______

Site Location STATE: MO

Section D — Required Client Information

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

Valid Matrix Codes: MATRIX / CODE — DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WP; AR; OT; TS

Requested Analysis Filtered (Y/N): Metals* N; CCR App IV Metals**+Hg N; Alkalinity N; Total Phosphorus N; Ferrous Iron N; Ferric Iron N

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	Composite Start DATE	Composite Start TIME	Composite End/Grab DATE	Composite End/Grab TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Metals*	CCR App IV Metals**+Hg	Alkalinity	Total Phosphorus	Ferrous Iron	Ferric Iron	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	M-MW-1	WT	G			11/20/18	1505		6	2	1	3						✓		✓	✓	✓	✓		
2	M-MW-2	WT	G																						
3	M-MW-3	WT	G																						
4	M-MW-4	WT	G																						
5	M-MW-5	WT	G																						
6	M-MW-6	WT	G																						
7	M-MW-7	WT	G																						
8	M-MW-8	WT	G																						
9	M-BMW-1	WT	G																						
10	M-BMW-2	WT	G																						
11	M-AMW-1	WT	G			11/20/18	~~1142~~ 1200		6	2	1	3						✓	✓	✓	✓	✓	✓		
12	M-AMW-2	WT	G																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*EPA 200.7: Fe, Mg, Mn, K, Na	[signature] / Golder	11/20/18	1640	[signature] / PACE	11/20/18	1640				
**EPA 200.7: Be, Co, Pb; **EPA 200.8: Sb, Cd, Se, Tl	[signature] / PACE	11/20/18	1700	[signature] / Pace	11-21-18	0330	1.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 11/20/18

MEMORANDUM

DATE January 8, 2019 **Project No.** 1531406

TO Project File
Golder Associates

CC

FROM Tommy Goodwin **EMAIL tgoodwin@golder.com**

DATA VALIDATION SUMMARY: AMEREN – MERAMEC ENERGY CENTER – NOVEMBER 2018 – CCR – DATA PACKAGE 60287288

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

- Analysis of Ferrous Iron for all samples was initiated outside of the 15-minute EPA required holding time, the detections in samples were qualified as estimates (J) or non-detect and estimates (UJ).
- 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 sample or 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).

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates
Project Name: Ameren - MEC-CCR-Nov 2018
Reviewer: T Goodwin

Project Manager: J Ingram
Project Number: 1531406
Validation Date: 1/8/19

Laboratory: Pace Analytical
SDG #: 60287288
Analytical Method (type and no.): Metals (200.7&200.8), Hg (7470), Alk (SM 2320B), TDS (SM 2540C), Fe (SM 3500-Fe B#4), Anions (300.0), P (365.4), Ra (903.1&904.0)
Matrix: ☐ Air ☐ Soil/Sed. ☒ Water ☐ Waste ☐ _____
Sample Names M-MW-1, M-MW-2, M-MW-3, M-MW-4, M-MW-5, M-MW-6, M-MW-7, M-MW-8
M-BMW-1, M-BMW-2, M-DUP-1, M-DUP-2, M-FB-1, M-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?	☒	☐	☐	11/19 - 11/20/18
b) Sampling team indicated?	☒	☐	☐	
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	
g) Field parameters collected (note types)?	☒	☐	☐	pH, Cond, Turb, Temp, DO, ORP, Q, DTW
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/performances from field logs or field notes?	☐	☒	☐	
j) Does the laboratory narrative indicate deficiencies?	☐	☐	☒	

Note Deficiencies: _____

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

General (reference QAPP or Method)	YES	NO	NA	COMMENTS
a) Were hold times met for sample pretreatment?	☐	☐	☒	
b) Were hold times met for sample analysis?	☐	☒	☐	Fe^{2+}
c) Were the correct preservatives used?	☒	☐	☐	
d) Was the correct method used?	☒	☐	☐	
e) Were appropriate reporting limits achieved?	☒	☐	☐	
f) Were any sample dilutions noted?	☐	☐	☐	
g) Were any matrix problems noted?	☐	☐	☐	

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	☑	☐	☐	Ca(54.6), Cl⁻(0.33), [0.17] Ra-228(0.839)
b) Were analytes detected in the field blank(s)?	☑	☐	☐	FB-1: B(77.0), Ca(70.1), Li(5.3), Cr(0.17), TDS(160), Cl⁻(
c) Were analytes detected in the equipment blank(s)?	☐	☐	☒	FB-2: B(40), Cr(0.098), TDS(60), Cl⁻(0.32)
d) Were analytes detected in the trip blank(s)?	☐	☐	☒	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?				Dup-1@ MW-6 DUP-2@ MW-7
	☐	☐	☐	FB-1@ MW-3 FB-2@ MW-8
b) Were field dup. precision criteria met (note RPD)?	☐	☐	☐	DUP-1: Cr(109), F⁻(200), Ra-228(200)
c) Were lab duplicates analyzed (note original and duplicate samples)?				DUP-2: Fe(101), Mn(200), F⁻(54), Ra-228(200), Fe³⁺(100)
	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☑	☐	☐	

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

Matrix Spike/Matrix Spike Duplicate (MS/MSD)	YES	NO	NA	COMMENTS
a) Was MS accuracy criteria met?	☐	☑	☐	Ca, SO_4^{2-}, P
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
b) Was MSD accuracy criteria met?	☐	☑	☐	Ca, Na, SO_4^{2-}
Recovery could not be calculated since sample contained high concentration of analyte?	☐	☐	☒	
c) Were MS/MSD precision criteria met?	☑	☐	☐	

Comments/Notes:

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
All Samples	Ferrous Iron (Fe^{2+})	—	J/UJ	Analyzed outside EPA hold time
M-MW-3	Lithium (Li)	10.0	U	Detected in ~~Method~~ Field Blank (~~MB~~ FB); MDL < Result < PQL
⊥	Chromium (Cr)	1.0	U	⊥ ⊥
M-MW-8	Fluoride (F^-)	0.19	UJ	RPD exceeded limit; Result < MDL (MDC)
⊥	Radium-228 (Ra-228)	0.621	UJ	⊥ ⊥
M-MW-7	Manganese (Mn)	0.73	UJ	
⊥	F^-	0.31	J	; Result > MDL (MDC)
⊥	Ra-228	0.842	J	⊥
⊥	Total Radium	1.376	J	
M-DUP-1	Ra-228	0.840	J	
⊥	Total Radium	1.453	J	
⊥	F^-	0.33	J	
M-DUP-2	F^-	0.54	J	⊥
⊥	Ra-228	0.605	UJ	⊥ ; Result < MDC
M-MW-8	Cr	1.0	U	FB; MDL < Result < PQL
M-FB-1	Calcium (Ca)	200	U	Method Blank (MB); MDL < Result < PQL
⊥	Chloride (Cl^-)	1.0	U	⊥ ⊥
M-FB-2	Cl^-	1.0	U	⊥
M-MW-1	Radium-228	0.573	J	⊥ ; MDC < Result < 10x B
⊥	Total Radium	1.663	J	⊥

Signature: Tommy A Goodin Jr Date: 1/8/19

APPENDIX C

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 MULTI-UNIT SURFACE IMPOUNDMENT NETWORK, MERAMEC ENERGY CENTER, ST LOUIS COUNTY MISSOURI

This Technical Memorandum provides the results of the Assessment Monitoring Statistical Evaluation for the Multi-unit Surface Impoundment Network at the Meramec Energy Center located in St. Louis 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). The following outliers were removed prior to the calculation of confidence limits; each of these statistical outliers identified were removed as a result of apparent laboratory analytical or transcription errors:

- Arsenic
  - MW-3 on 7/18/2016: result is considered a non-detect due to data validation and is statistically lower than the other values at the same well
  - MW-8 on 7/19/2016: result is statistically lower than other values at the same well
- Fluoride
  - MW-1 on 4/4/2018: result is statistically lower than other values at the same well
  - MW-8 on 4/5/2018: result is the only non-detect at that well and is statistically lower than the other values at the same well
- Lithium
  - All samples collected 5/17/2018 and 5/18/2018 were removed due to laboratory error and high PQL and MDL values.
- Selenium
  - MW-8 on 7/19/2016: result is suspected transcription error and the only value at the well that was not a non-detect value.

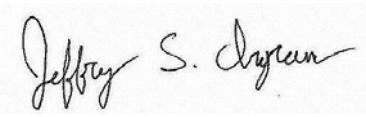
Golder Associates Inc.
13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021 T: +1 314 984-8800 F: +1 314 984-8770

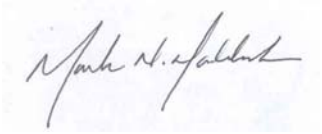
A summary of SSLs at corresponding wells is as follows:

- Arsenic at MW-4 and MW-5
- Lithium at MW-6
- Molybdenum at MW-6, MW-7 and MW-8

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 – MEC Groundwater Protection Standards
Appendix A – Sanitas Confidence Interval Statistical Output

Table 1
Meramec Groundwater Protection Standards
Meramec Surface Impoundments
Meramec Energy Center, St. Louis 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	10	2.344
Barium	µg/L	2000	2000	566
Beryllium	µg/L	4	4	DQR
Cadmium	µg/L	5	5	DQR
Chromium	µg/L	100	100	1.8
Cobalt	µg/L	6	6	DQR
Fluoride	mg/l	4	4	0.5215
Lead	µg/L	15	15	DQR
Lithium	µg/L	40	40	16
Mercury	µg/L	2	2	DQR
Molybdenum	µg/L	100	100	DQR
Radium 226 + 228	pCi/L	5	5	1.888
Selenium	µg/L	50	50	DQR
Thallium	µg/L	2	2	DQR

Notes:

Prepared by: JSI 10/3/2018
Checked by: TJG 10/5/2018
Reviewed by: MNH 10/10/2018

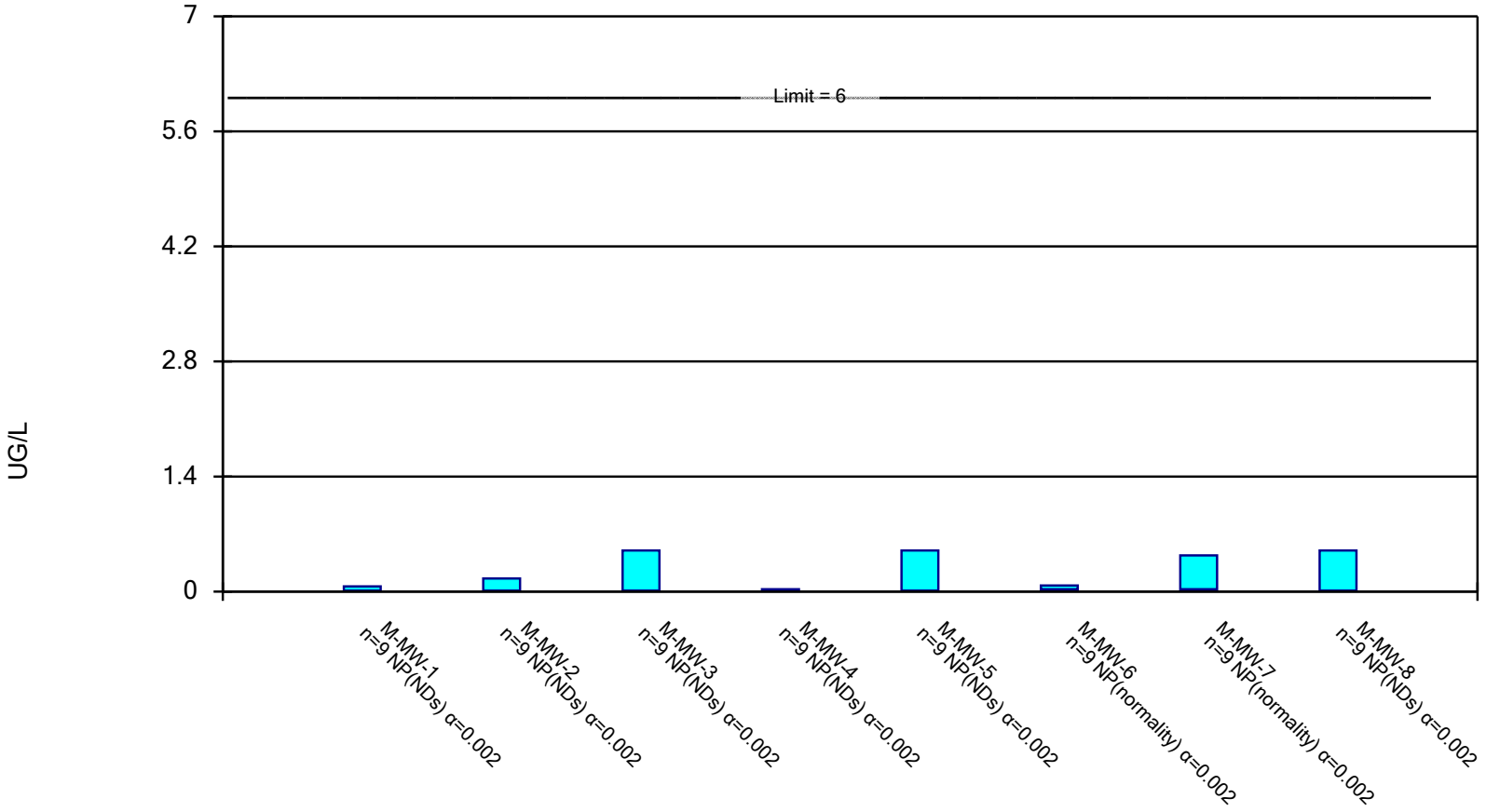
1. µg/L - micrograms per liter
2. mg/L - milligrams per liter
3. pCi/L - picocuries per liter
4. MCL - Maximum Contaminant Level. MCLs from United States Environmental Protection Agency (USEPA) 2012 Edition of the Drinking Water Standards and Health Advisories. Spring 2012. http://water.epa.gov/drink/contaminants/index.cfm.
5. Health Based Groundwater Protection Standards (GWPS) were adoped 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 BMW-1 and BMW-2.

APPENDIX A

Sanitas Confidence Interval Statistical Output

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

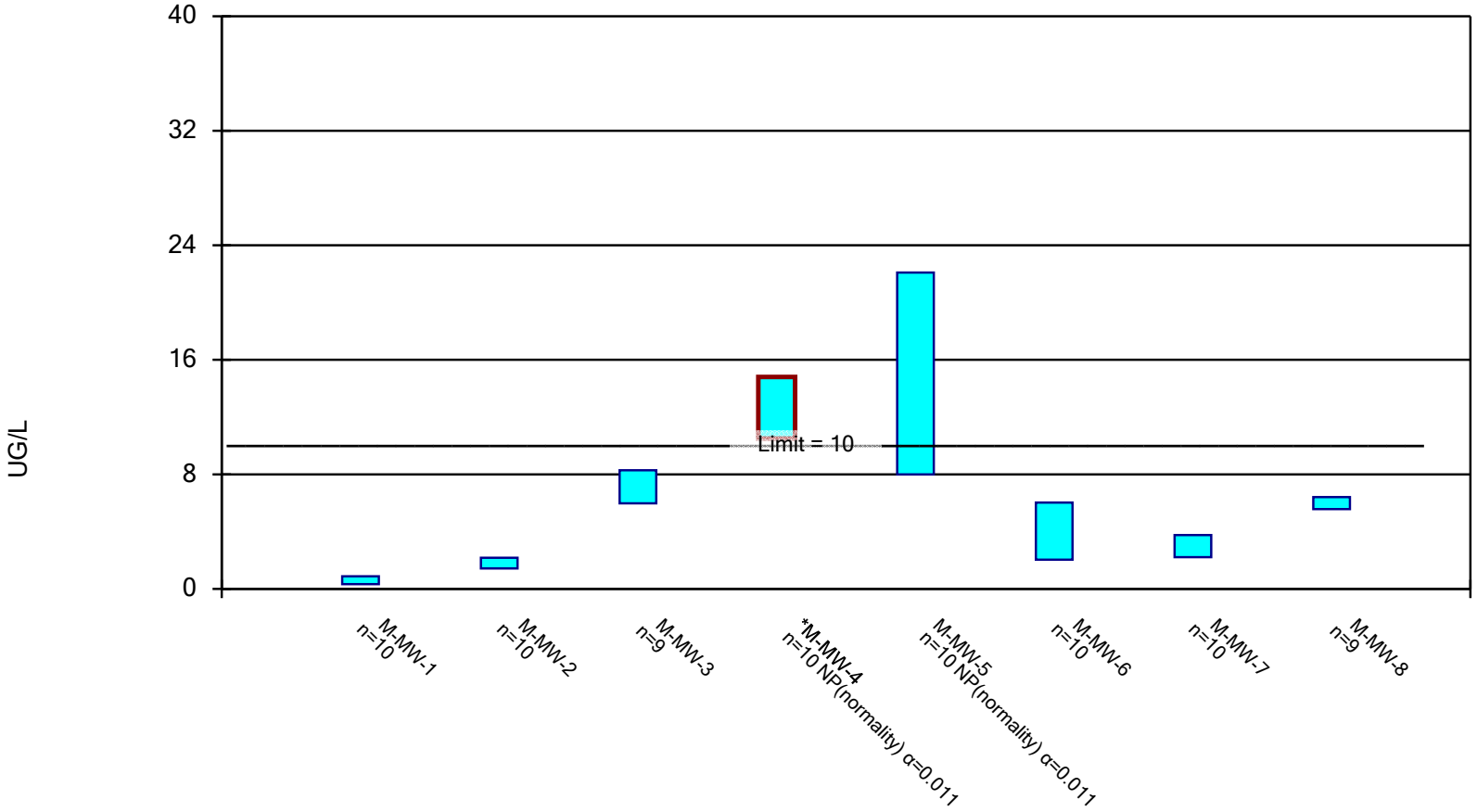


Constituent: ANTIMONY, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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

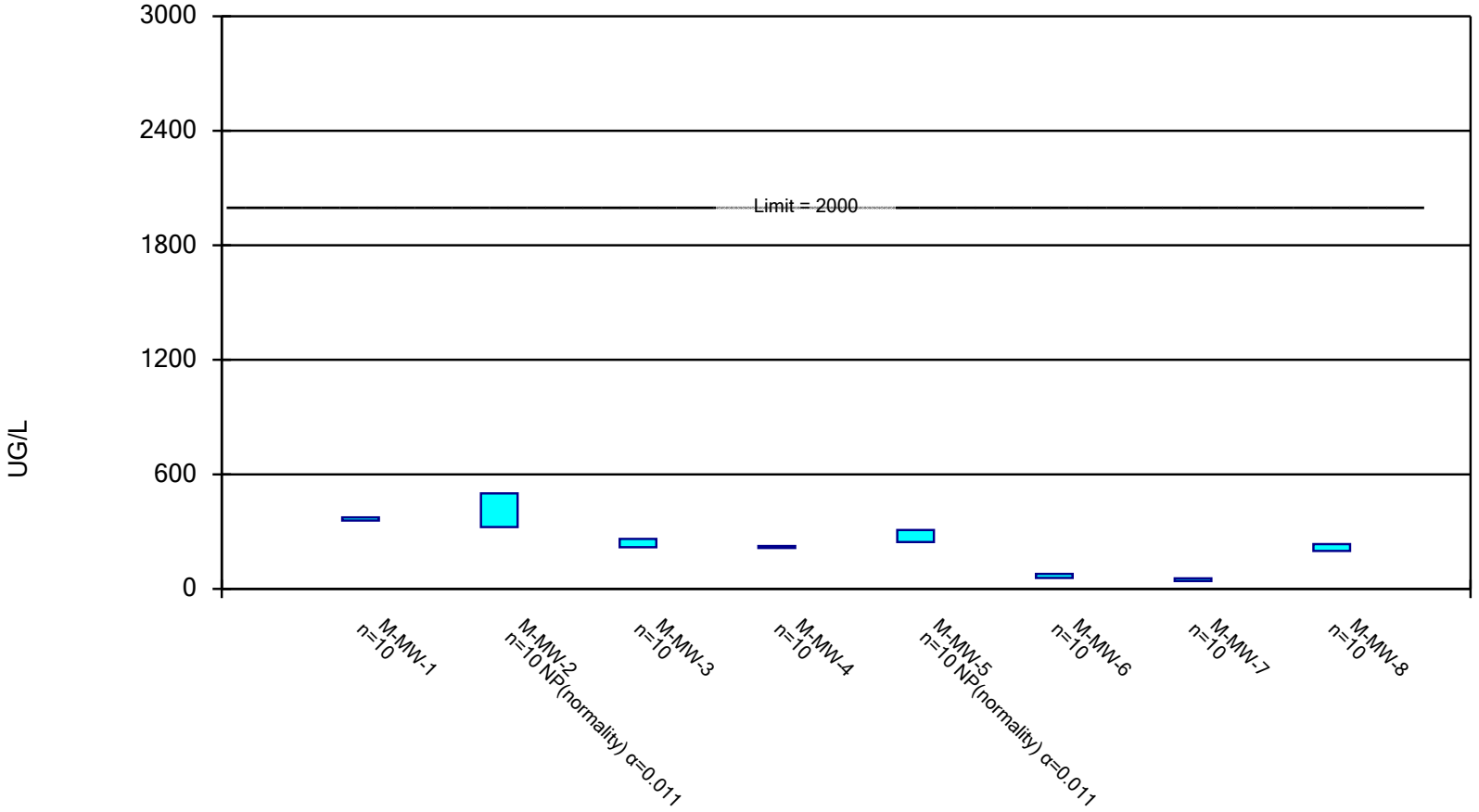


Constituent: ARSENIC, TOTAL Analysis Run 10/9/2018 11:13 AM

Meramec E.C. Client: Ameren Data: MEC 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.

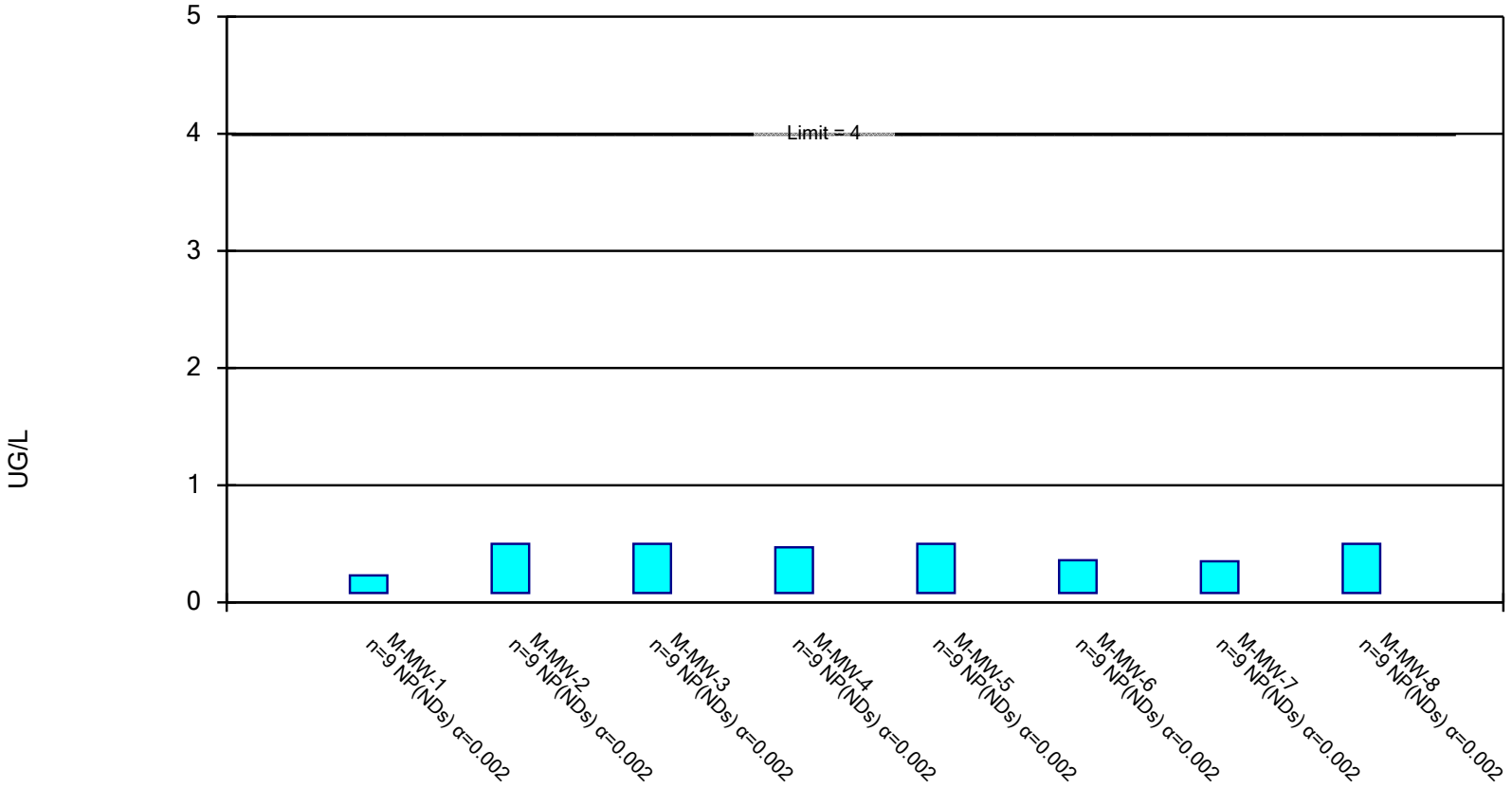


Constituent: BARIUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

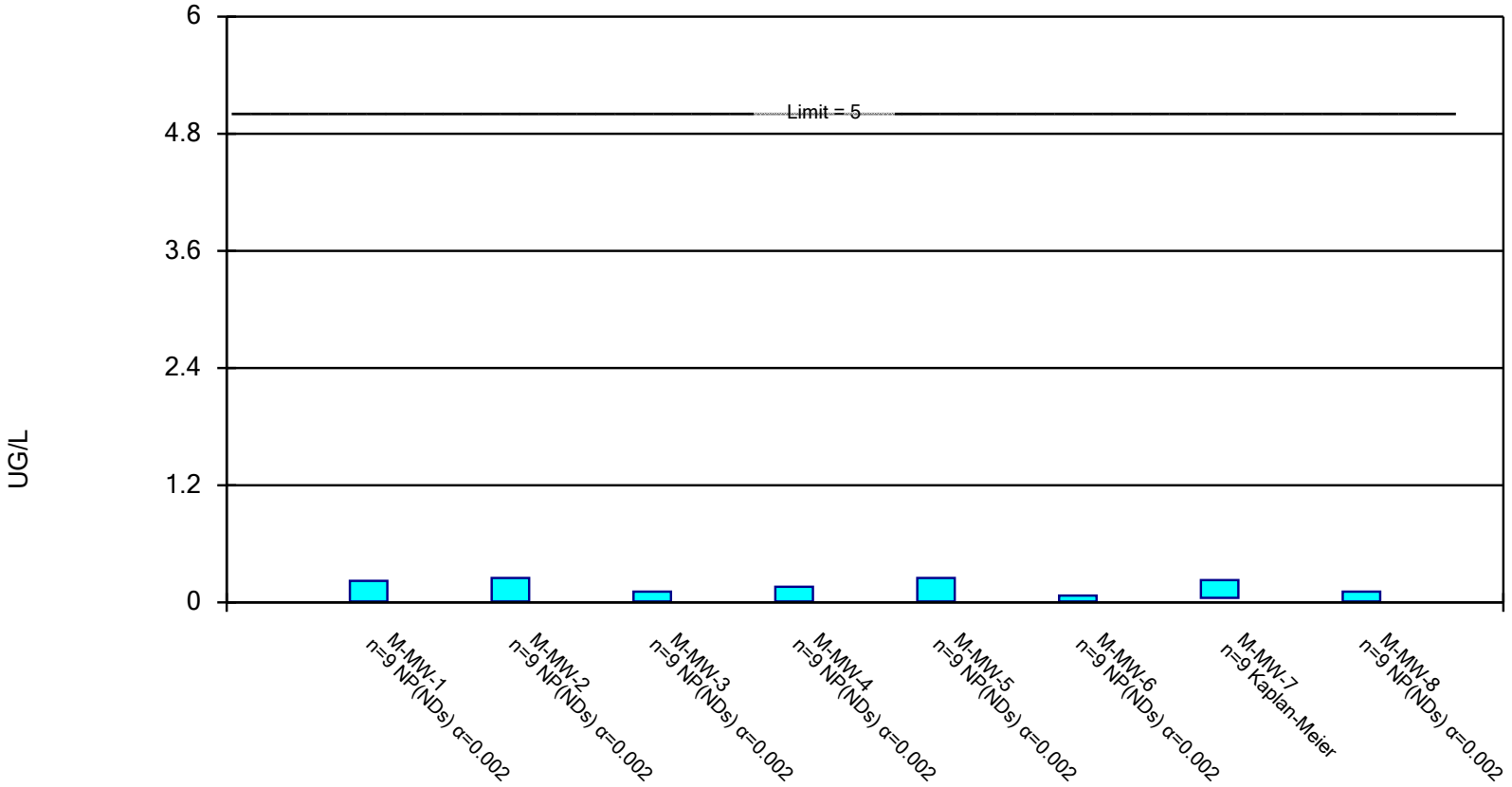


Constituent: BERYLLIUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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.

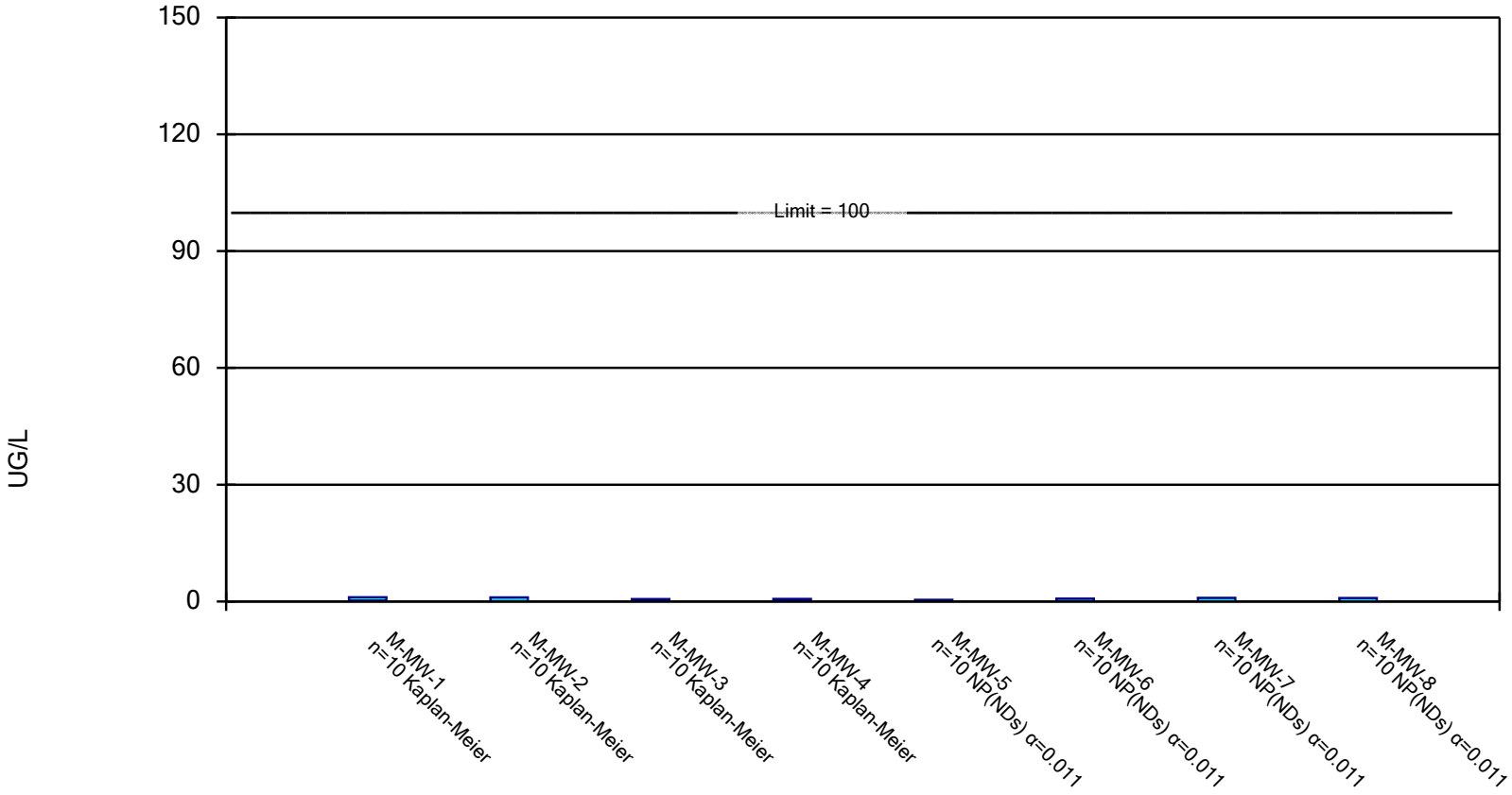


Constituent: CADMIUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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.

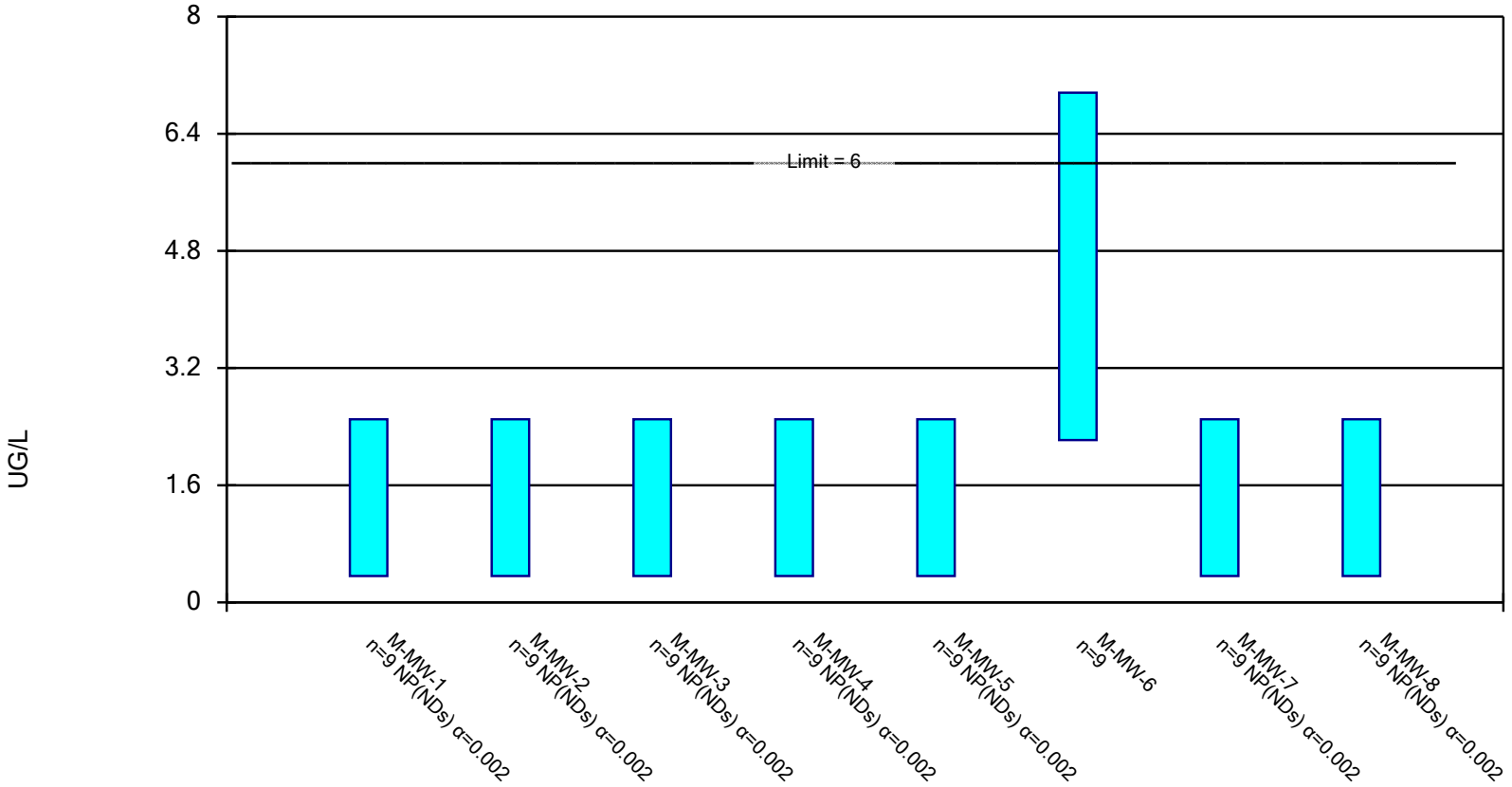


Constituent: CHROMIUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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: COBALT, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC Data

Parametric Confidence Interval

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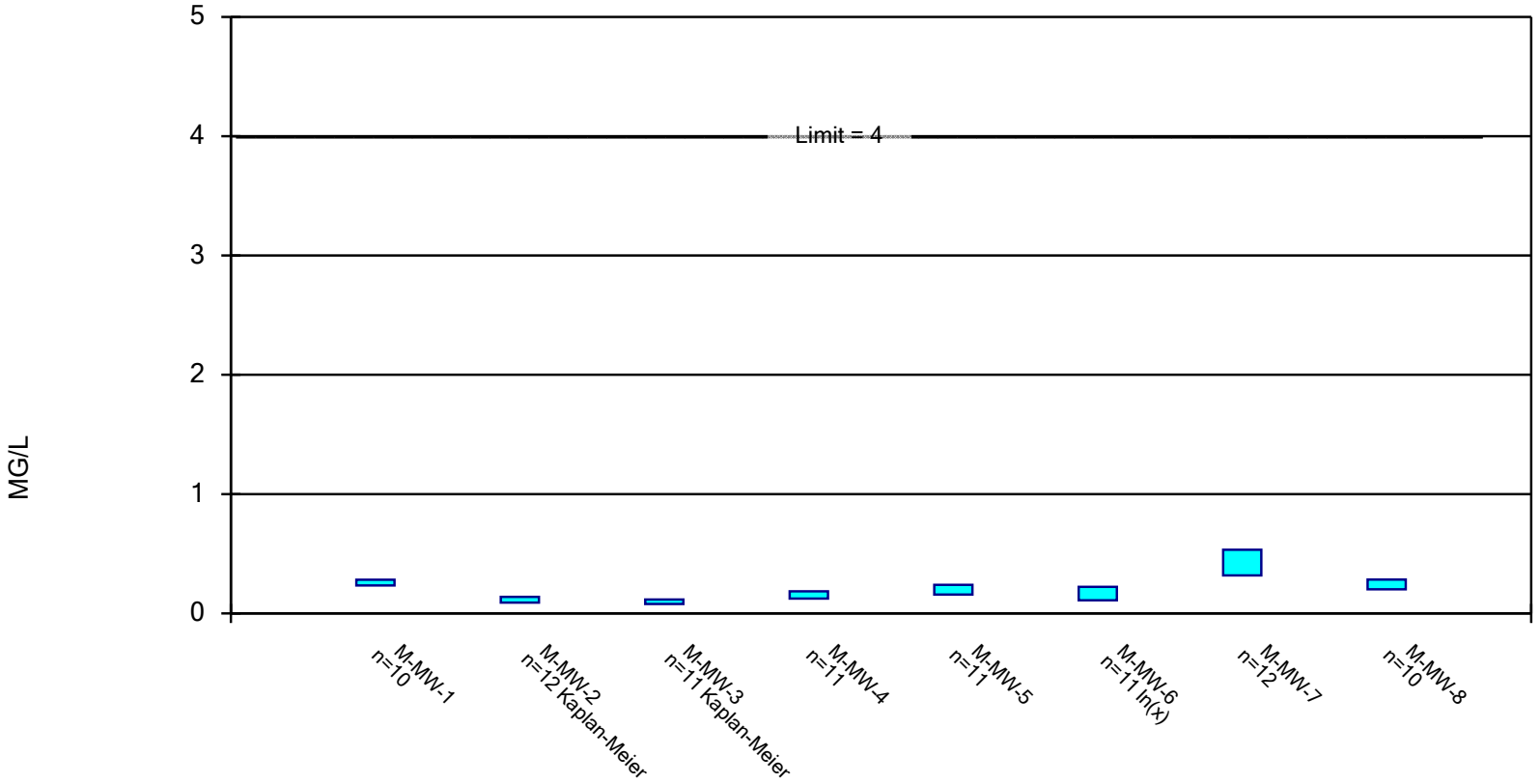
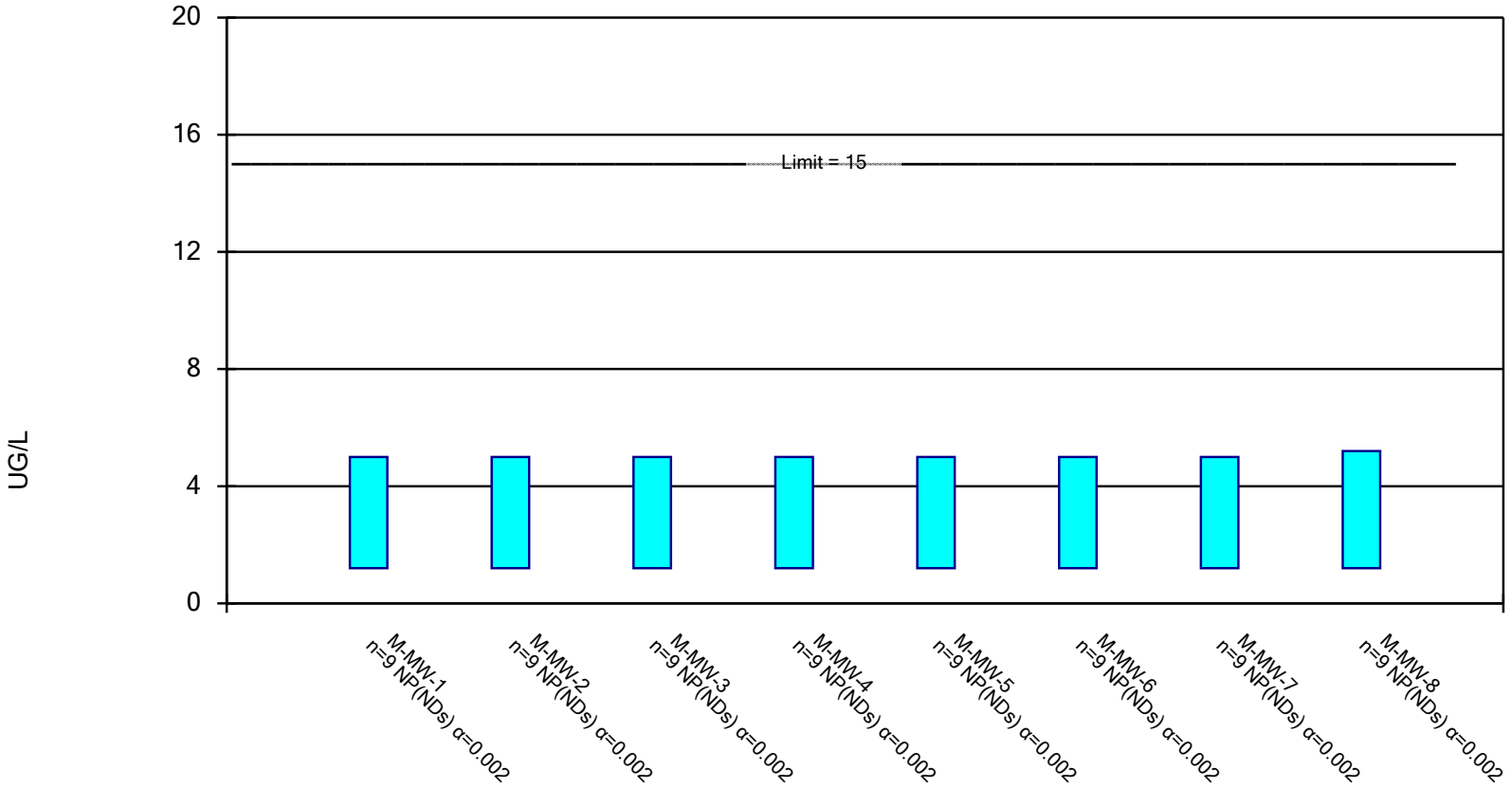


Constituent: FLUORIDE, TOTAL Analysis Run 10/9/2018 11:15 AM

Meramec E.C. Client: Ameren Data: MEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

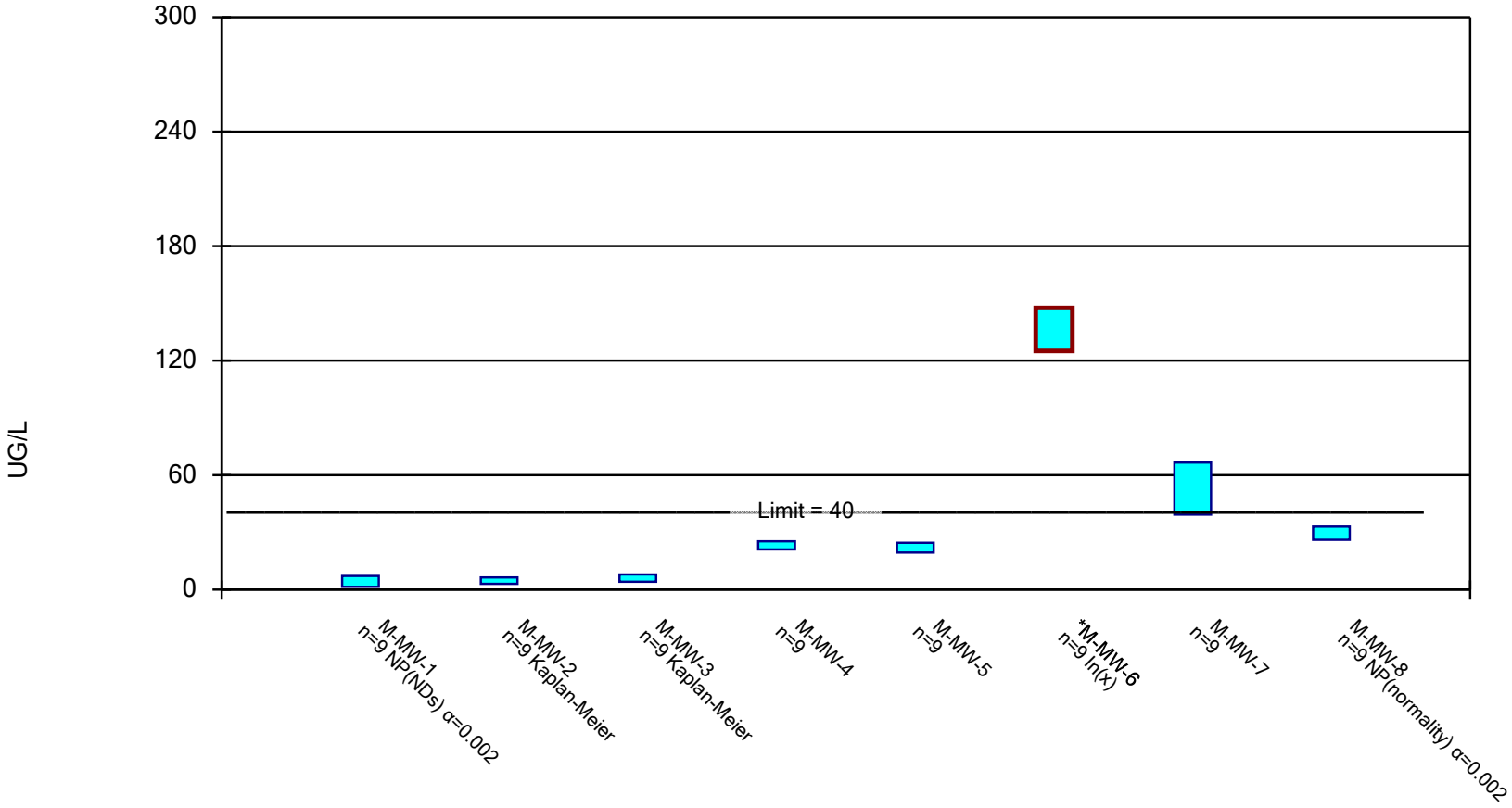


Constituent: LEAD, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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

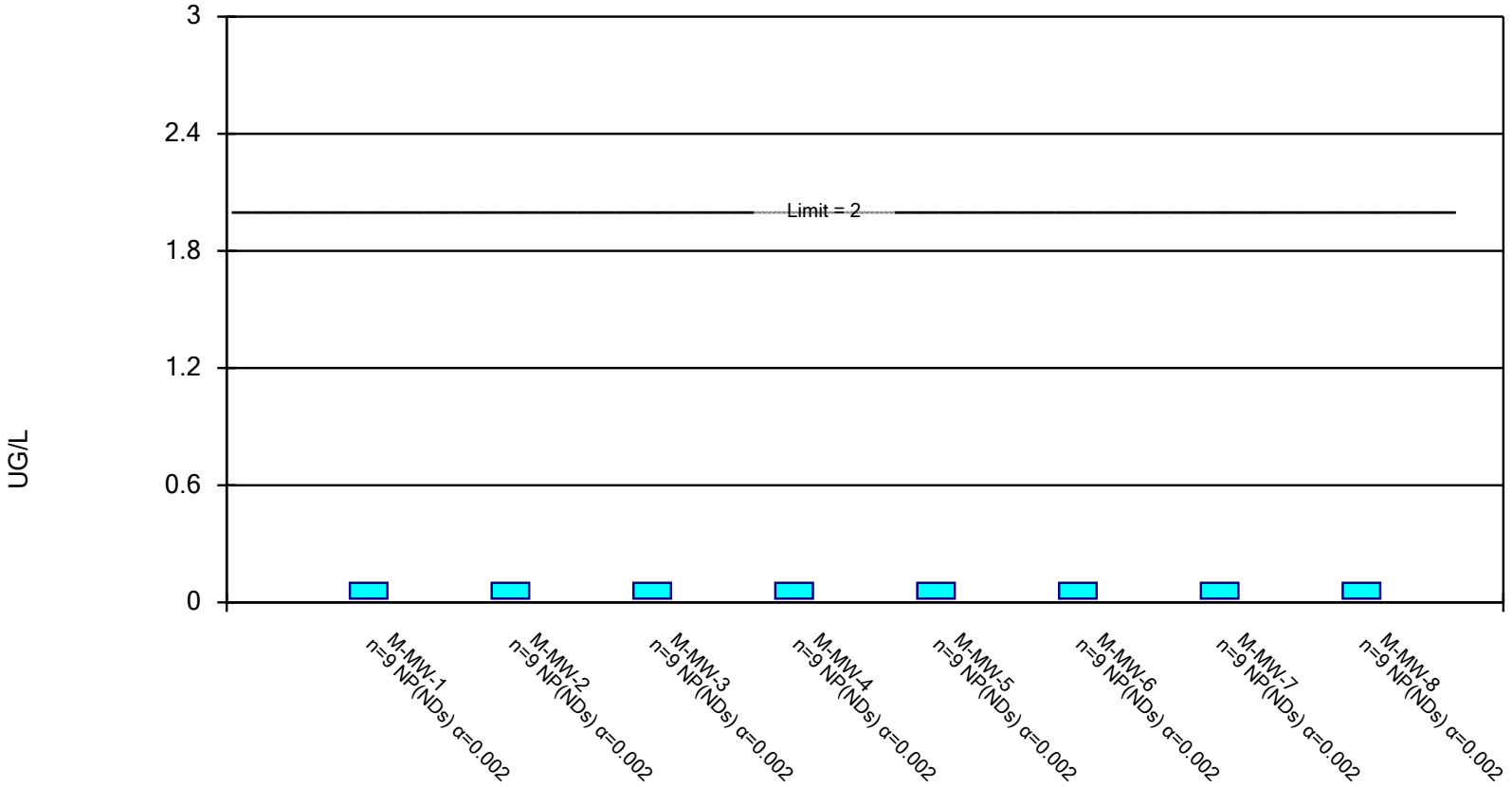


Constituent: LITHIUM, TOTAL Analysis Run 10/9/2018 11:16 AM

Meramec E.C. Client: Ameren Data: MEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.

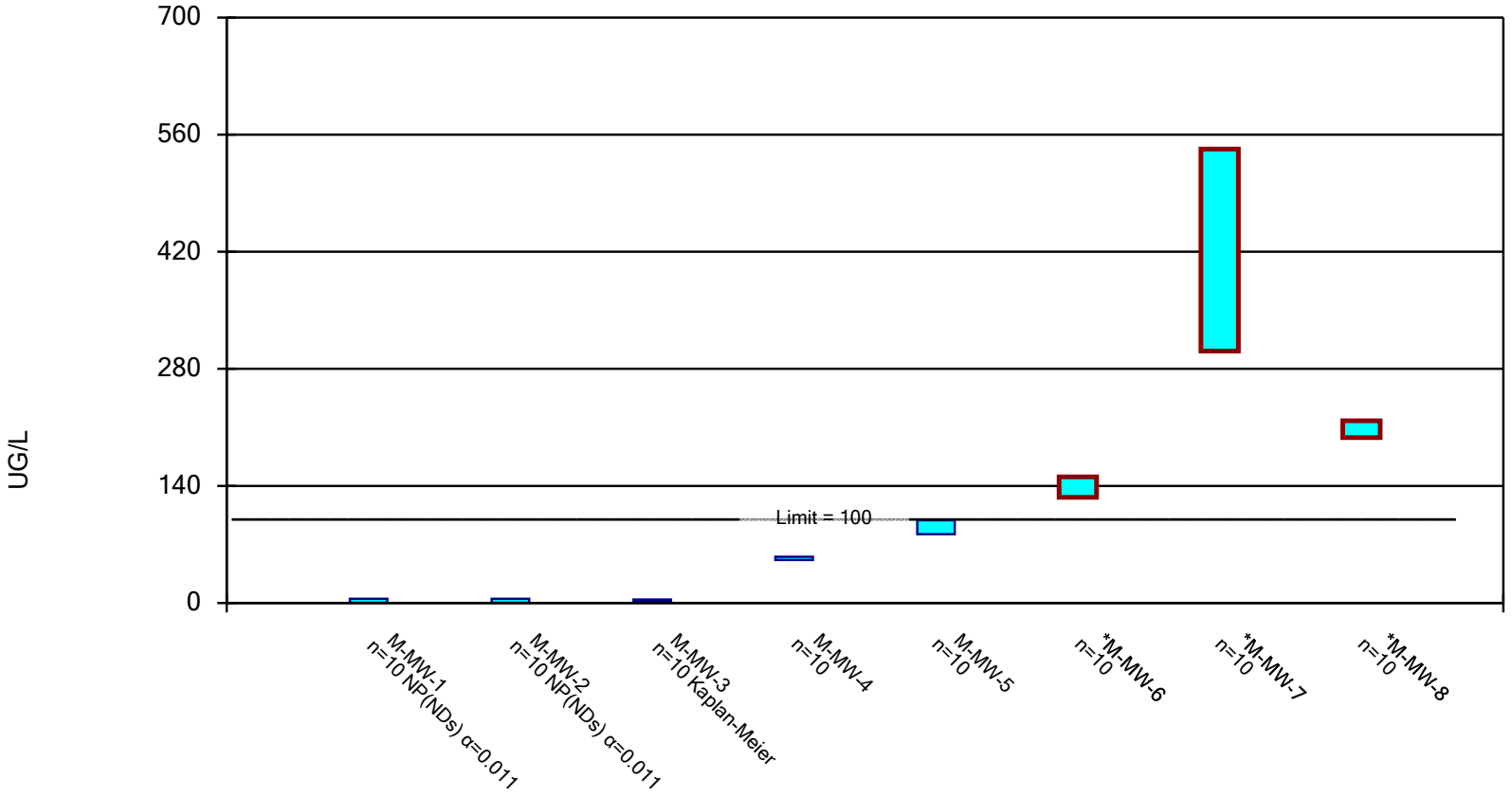


Constituent: MERCURY, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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.

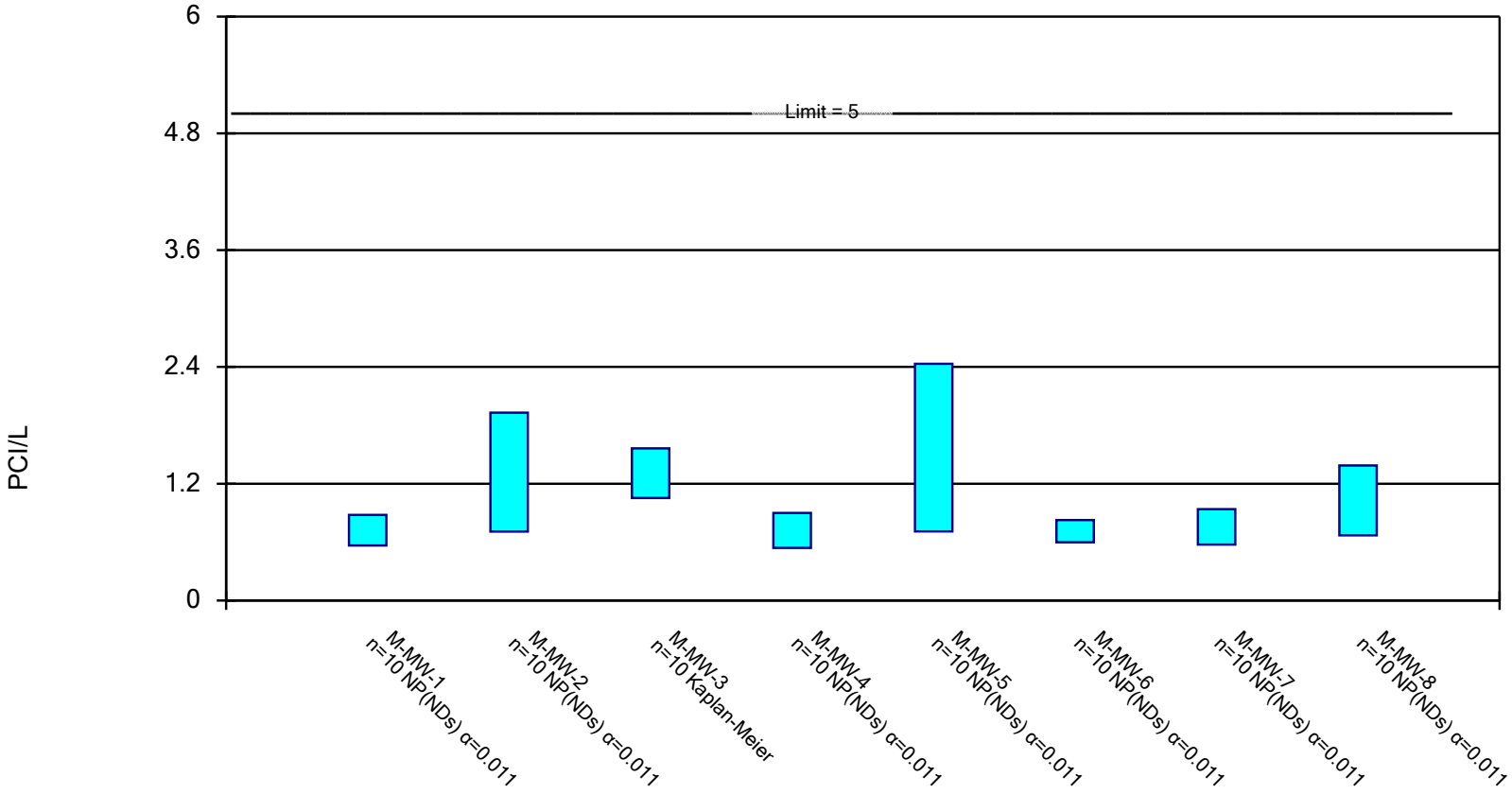


Constituent: MOLYBDENUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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.

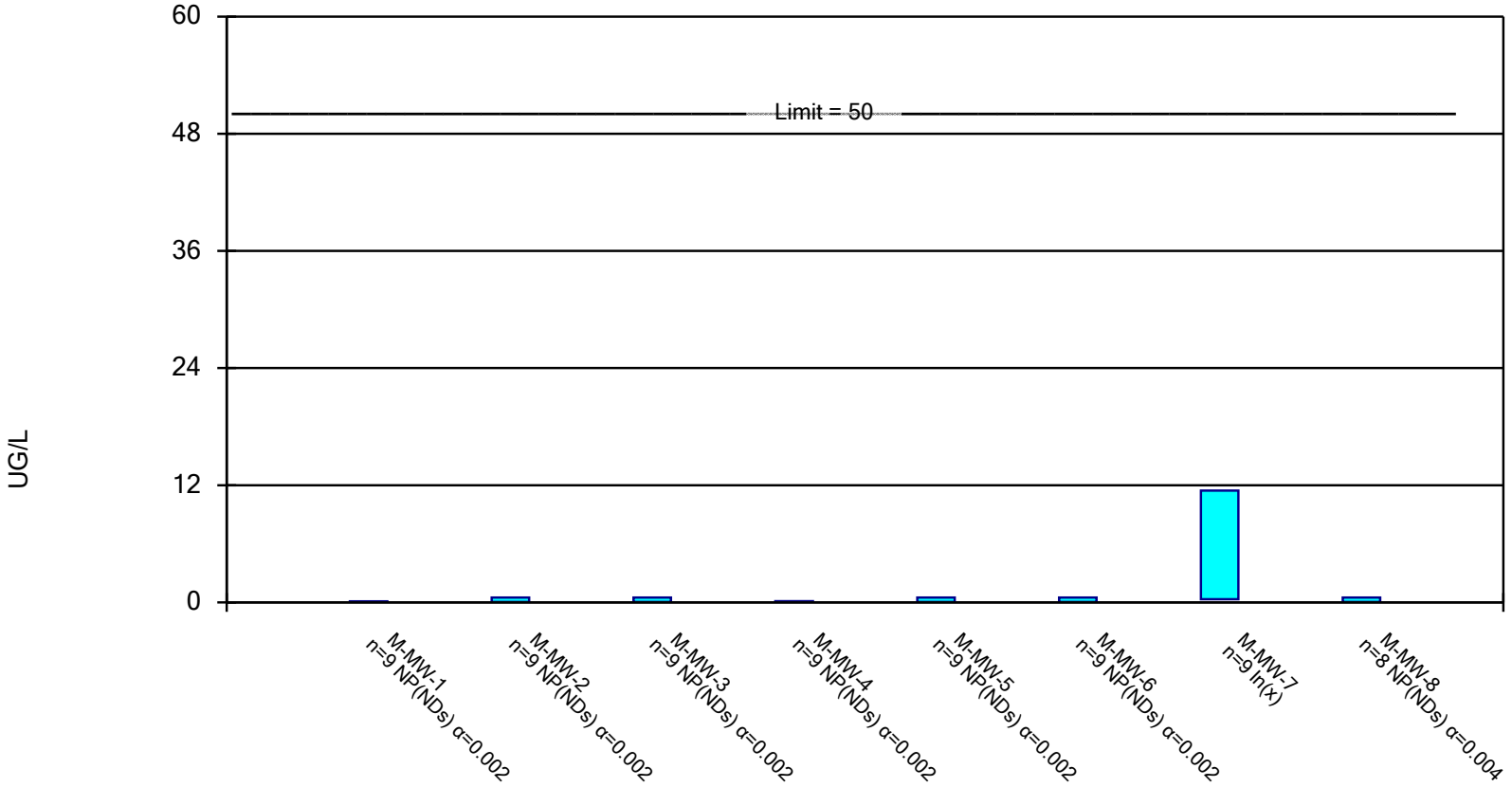


Constituent: Radium [226 + 228] Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC 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.

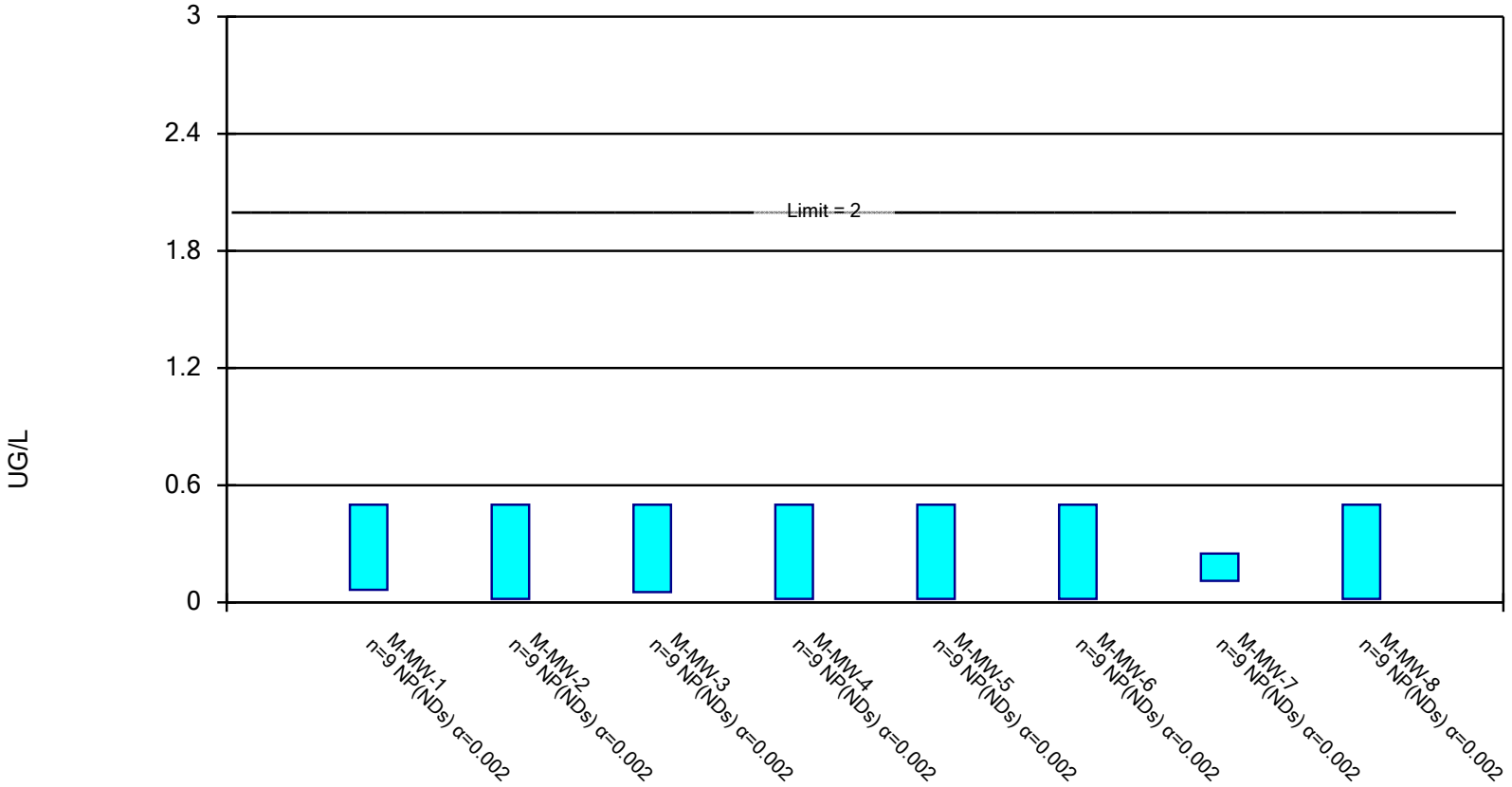


Constituent: SELENIUM, TOTAL Analysis Run 10/9/2018 11:18 AM

Meramec E.C. Client: Ameren Data: MEC Data

Non-Parametric Confidence Interval

Compliance Limit is not exceeded.



Constituent: THALLIUM, TOTAL Analysis Run 10/4/2018 1:33 PM

Meramec E.C. Client: Ameren Data: MEC Data

Confidence Interval

Meramec E.C. Client: Ameren Data: MEC Data Printed 10/9/2018, 3:07 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
ANTIMONY, TOTAL (UG/L)	M-MW-1	0.063	0.013	6	No	9	66.67	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	M-MW-2	0.16	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	M-MW-3	0.5	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	M-MW-4	0.029	0.013	6	No	9	88.89	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	M-MW-5	0.5	0.013	6	No	9	100	No	0.002	NP (NDs)
ANTIMONY, TOTAL (UG/L)	M-MW-6	0.073	0.029	6	No	9	44.44	No	0.002	NP (normality)
ANTIMONY, TOTAL (UG/L)	M-MW-7	0.44	0.029	6	No	9	11.11	No	0.002	NP (normality)
ANTIMONY, TOTAL (UG/L)	M-MW-8	0.5	0.013	6	No	9	66.67	No	0.002	NP (NDs)
BARIUM, TOTAL (UG/L)	M-MW-1	374.6	358	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	M-MW-2	500	324	2000	No	10	0	No	0.011	NP (normality)
BARIUM, TOTAL (UG/L)	M-MW-3	261.7	218.5	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	M-MW-4	224.6	214.4	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	M-MW-5	308	245	2000	No	10	0	No	0.011	NP (normality)
BARIUM, TOTAL (UG/L)	M-MW-6	78.35	57.57	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	M-MW-7	55.09	40.91	2000	No	10	0	No	0.01	Param.
BARIUM, TOTAL (UG/L)	M-MW-8	234.5	198.7	2000	No	10	0	No	0.01	Param.
BERYLLIUM, TOTAL (UG/L)	M-MW-1	0.23	0.08	4	No	9	77.78	No	0.002	NP (NDs)
ARSENIC, TOTAL (UG/L)	M-MW-1	0.8743	0.3289	10	No	10	10	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	M-MW-2	2.176	1.424	10	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	M-MW-3	8.287	5.98	10	No	9	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	**M-MW-4**	**14.8**	**10.5**	**10**	**Yes**	**10**	**0**	**No**	**0.011**	**NP (normality)**
ARSENIC, TOTAL (UG/L)	M-MW-5	22.1	8	10	No	10	0	No	0.011	NP (normality)
ARSENIC, TOTAL (UG/L)	M-MW-6	6.028	2.042	10	No	10	10	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	M-MW-7	3.76	2.22	10	No	10	0	No	0.01	Param.
ARSENIC, TOTAL (UG/L)	M-MW-8	6.408	5.57	10	No	9	0	No	0.01	Param.
BERYLLIUM, TOTAL (UG/L)	M-MW-2	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-3	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-4	0.47	0.08	4	No	9	66.67	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-5	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-6	0.36	0.08	4	No	9	88.89	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-7	0.35	0.08	4	No	9	88.89	No	0.002	NP (NDs)
BERYLLIUM, TOTAL (UG/L)	M-MW-8	0.5	0.08	4	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-1	0.22	0.009	5	No	9	77.78	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-2	0.25	0.009	5	No	9	100	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-3	0.11	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-4	0.16	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-5	0.25	0.009	5	No	9	88.89	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-6	0.069	0.009	5	No	9	66.67	No	0.002	NP (NDs)
CADMIUM, TOTAL (UG/L)	M-MW-7	0.2288	0.04615	5	No	9	22.22	No	0.01	Param.
CADMIUM, TOTAL (UG/L)	M-MW-8	0.11	0.009	5	No	9	66.67	No	0.002	NP (NDs)
CHROMIUM, TOTAL (UG/L)	M-MW-1	1.06	0.2264	100	No	10	30	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	M-MW-2	1.041	0.08408	100	No	10	40	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	M-MW-3	0.6045	0.09271	100	No	10	50	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	M-MW-4	0.6701	0.1104	100	No	10	50	No	0.01	Param.
CHROMIUM, TOTAL (UG/L)	M-MW-5	0.42	0.027	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	M-MW-6	0.71	0.027	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	M-MW-7	0.91	0.027	100	No	10	60	No	0.011	NP (NDs)
CHROMIUM, TOTAL (UG/L)	M-MW-8	0.88	0.027	100	No	10	70	No	0.011	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-1	2.5	0.36	6	No	9	88.89	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-2	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)

Confidence Interval

Meramec E.C. Client: Ameren Data: MEC Data Printed 10/9/2018, 3:07 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
COBALT, TOTAL (UG/L)	M-MW-3	2.5	0.36	6	No	9	55.56	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-4	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-5	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-6	6.961	2.217	6	No	9	0	No	0.01	Param.
COBALT, TOTAL (UG/L)	M-MW-7	2.5	0.36	6	No	9	88.89	No	0.002	NP (NDs)
COBALT, TOTAL (UG/L)	M-MW-8	2.5	0.36	6	No	9	100	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-1	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-2	5	1.2	15	No	9	55.56	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-3	5	1.2	15	No	9	88.89	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-4	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-5	5	1.2	15	No	9	66.67	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-6	5	1.2	15	No	9	88.89	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-7	5	1.2	15	No	9	77.78	No	0.002	NP (NDs)
LEAD, TOTAL (UG/L)	M-MW-8	5.2	1.2	15	No	9	66.67	No	0.002	NP (NDs)
LITHIUM, TOTAL (UG/L)	M-MW-1	7.1	1.45	40	No	9	88.89	No	0.002	NP (NDs)
LITHIUM, TOTAL (UG/L)	M-MW-2	6.327	2.984	40	No	9	33.33	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	M-MW-3	7.916	4.084	40	No	9	22.22	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	M-MW-4	25.33	21.05	40	No	9	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-1	0.2825	0.2335	4	No	10	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-2	0.1387	0.09097	4	No	12	16.67	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-3	0.1168	0.07811	4	No	11	27.27	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-4	0.1854	0.1237	4	No	11	9.091	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-5	0.2388	0.1576	4	No	11	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-6	0.2226	0.11	4	No	11	0	ln(x)	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-7	0.5328	0.3189	4	No	12	0	No	0.01	Param.
FLUORIDE, TOTAL (MG/L)	M-MW-8	0.2838	0.2022	4	No	10	0	No	0.01	Param.
MERCURY, TOTAL (UG/L)	M-MW-1	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-2	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-3	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-4	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-5	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-6	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-7	0.1	0.0195	2	No	9	100	No	0.002	NP (NDs)
MERCURY, TOTAL (UG/L)	M-MW-8	0.1	0.0195	2	No	9	88.89	No	0.002	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	M-MW-1	5	0.26	100	No	10	90	No	0.011	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	M-MW-2	5	0.26	100	No	10	70	No	0.011	NP (NDs)
MOLYBDENUM, TOTAL (UG/L)	M-MW-3	4.155	1.342	100	No	10	30	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	M-MW-4	55.24	51.38	100	No	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	M-MW-5	98.86	82.26	100	No	10	0	No	0.01	Param.
MOLYBDENUM, TOTAL (UG/L)	**M-MW-6**	**150.8**	**126.4**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**M-MW-7**	**542.8**	**301.2**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
MOLYBDENUM, TOTAL (UG/L)	**M-MW-8**	**217.9**	**197.7**	**100**	**Yes**	**10**	**0**	**No**	**0.01**	**Param.**
Radium [226 + 228] (PCI/L)	M-MW-1	0.8785	0.565	5	No	10	90	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	M-MW-2	1.93	0.7075	5	No	10	70	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	M-MW-3	1.563	1.053	5	No	10	40	No	0.01	Param.
Radium [226 + 228] (PCI/L)	M-MW-4	0.9	0.541	5	No	10	90	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	M-MW-5	2.432	0.71	5	No	10	60	No	0.011	NP (NDs)
LITHIUM, TOTAL (UG/L)	M-MW-5	24.5	19.43	40	No	9	0	No	0.01	Param.
LITHIUM, TOTAL (UG/L)	**M-MW-6**	**147.6**	**125.1**	**40**	**Yes**	**9**	**0**	**ln(x)**	**0.01**	**Param.**
LITHIUM, TOTAL (UG/L)	M-MW-7	66.55	39.3	40	No	9	0	No	0.01	Param.

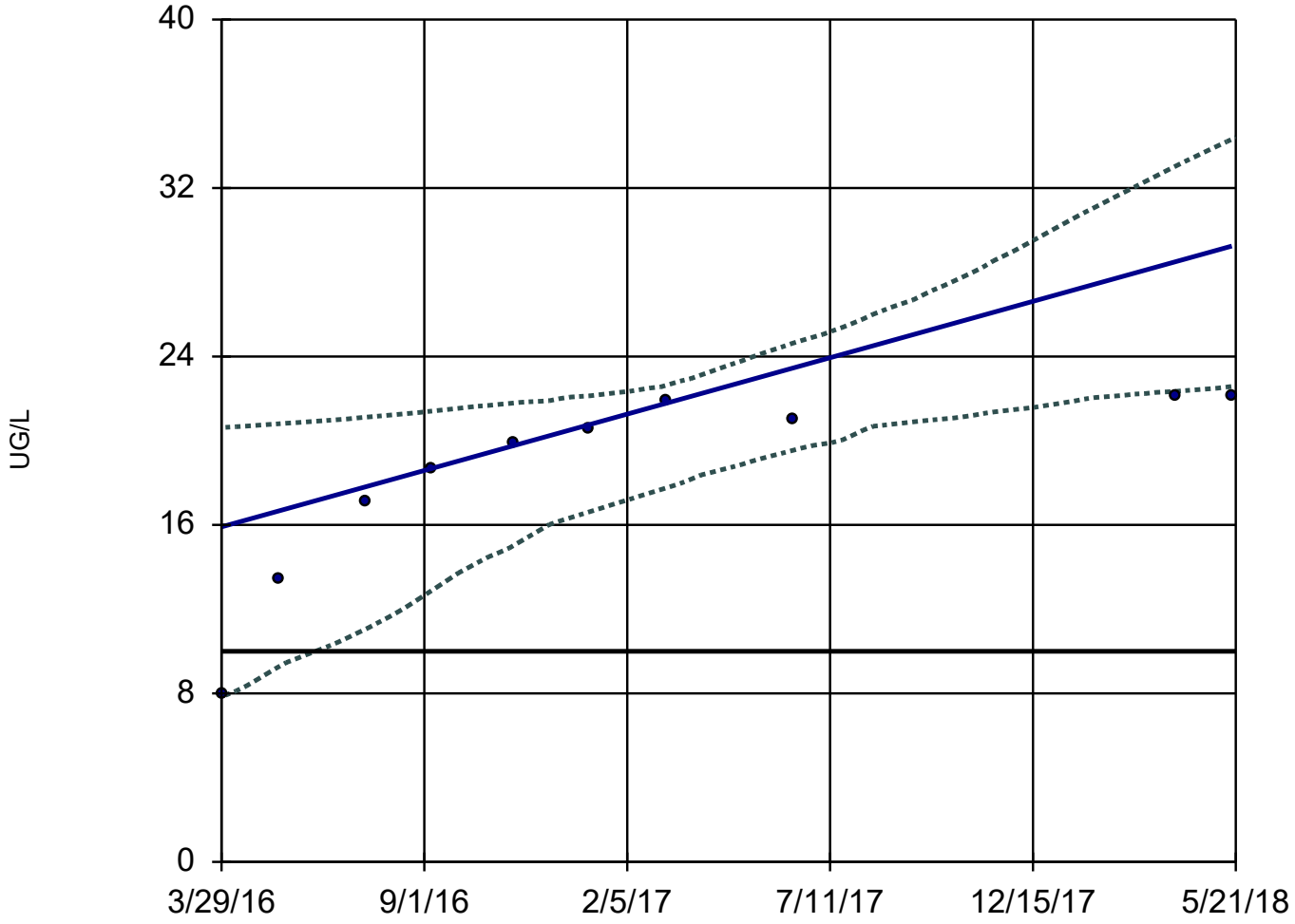
Confidence Interval

Meramec E.C. Client: Ameren Data: MEC Data Printed 10/9/2018, 3:07 PM

Constituent	Well	Upper Lim.	Lower Lim.	Compliance	Sig.	N	%NDs	Transform	Alpha	Method
LITHIUM, TOTAL (UG/L)	M-MW-8	33	26.1	40	No	9	0	No	0.002	NP (normality)
Radium [226 + 228] (PCI/L)	M-MW-6	0.827	0.5985	5	No	10	100	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	M-MW-7	0.9385	0.575	5	No	10	90	No	0.011	NP (NDs)
Radium [226 + 228] (PCI/L)	M-MW-8	1.387	0.669	5	No	10	80	No	0.011	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-1	0.5	0.064	2	No	9	77.78	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-2	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-3	0.5	0.053	2	No	9	77.78	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-4	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-5	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-6	0.5	0.018	2	No	9	88.89	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-7	0.25	0.11	2	No	9	66.67	No	0.002	NP (NDs)
THALLIUM, TOTAL (UG/L)	M-MW-8	0.5	0.018	2	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-1	0.1	0.043	50	No	9	88.89	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-2	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-3	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-4	0.12	0.043	50	No	9	88.89	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-5	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-6	0.5	0.043	50	No	9	100	No	0.002	NP (NDs)
SELENIUM, TOTAL (UG/L)	M-MW-7	11.45	0.3203	50	No	9	11.11	ln(x)	0.01	Param.
SELENIUM, TOTAL (UG/L)	M-MW-8	0.5	0.043	50	No	8	100	No	0.004	NP (NDs)

Sen's Slope and 95% Confidence Band

M-MW-5



n = 10

Slope = 6.239 units per year.

Mann-Kendall statistic = 42
critical = 27

Increasing trend significant at 98% confidence level (α = 0.01 per tail).

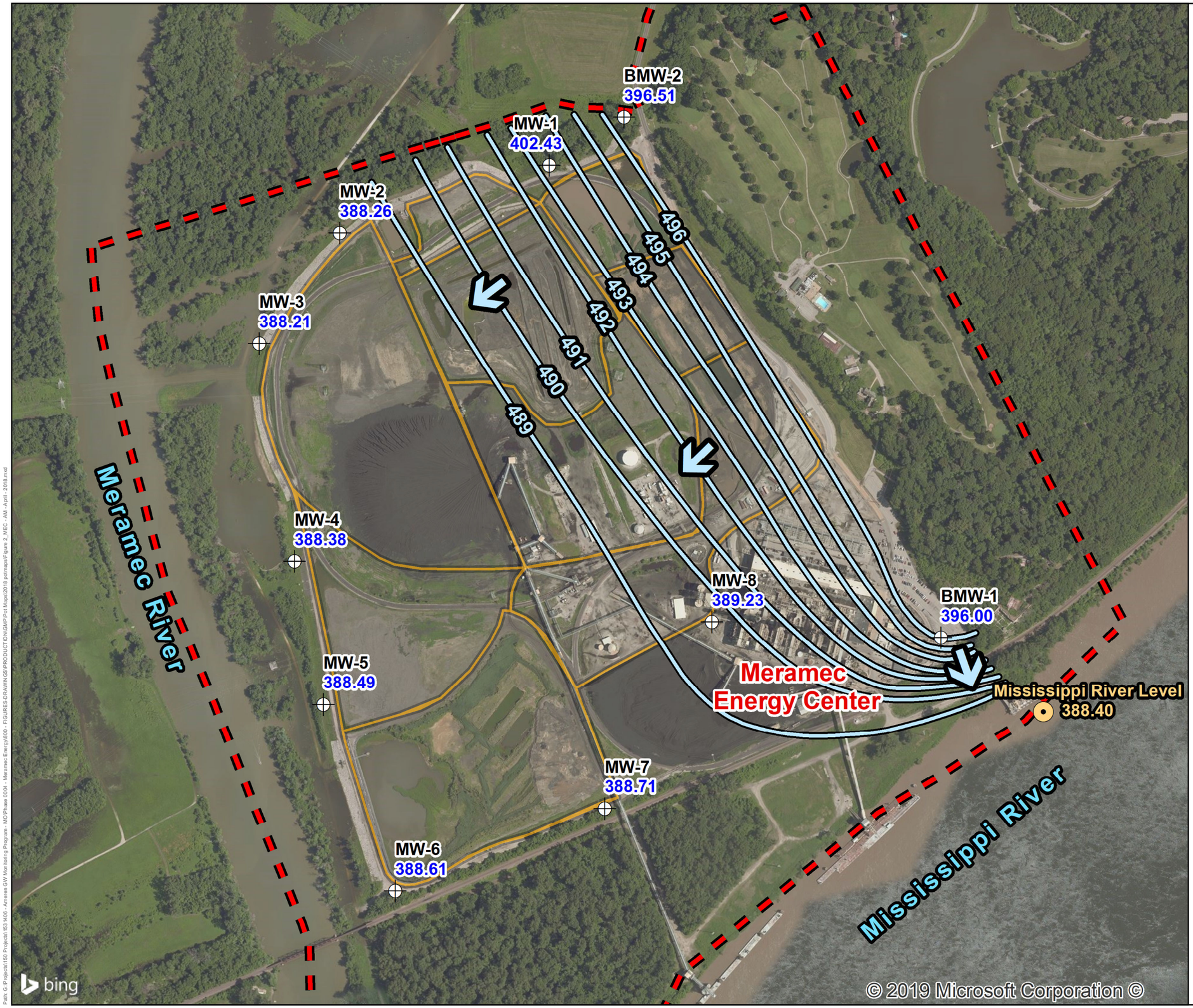
GWPS - 10 UG/L = 10.

Constituent: ARSENIC, TOTAL

Meramec E.C. Client: Ameren Data: MEC Data

APPENDIX D

Potentiometric Surface Maps



LEGEND

- Meramec Energy Center Property Boundary
- All Surface Impoundments

Groundwater Elevation Contours

- Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- Groundwater Monitoring Well
- Mississippi River Gauge
- Groundwater Flow Direction

KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER MONITORING WELLS SURVEYED BY ZAHNER AND ASSOCIATES, INC. ON FEBRUARY 4 AND APRIL 28, 2016.
4. WELL MW-1 NOT USED FOR POTENTIOMETRIC SURFACE MAP CONTOURING.
5. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
6. MISSISSIPPI RIVER AND POND LEVELS PROVIDED BY AMEREN.

REFERENCES

1.) AMEREN MISSOURI MERAMEC ENERGY CENTER, MERAMEC PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2401 FEET.

0 500 1,000
Feet

CLIENT
AMEREN MISSOURI
MERAMEC ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
POTENTIOMETRIC SURFACE MAP - APRIL 3, 2018

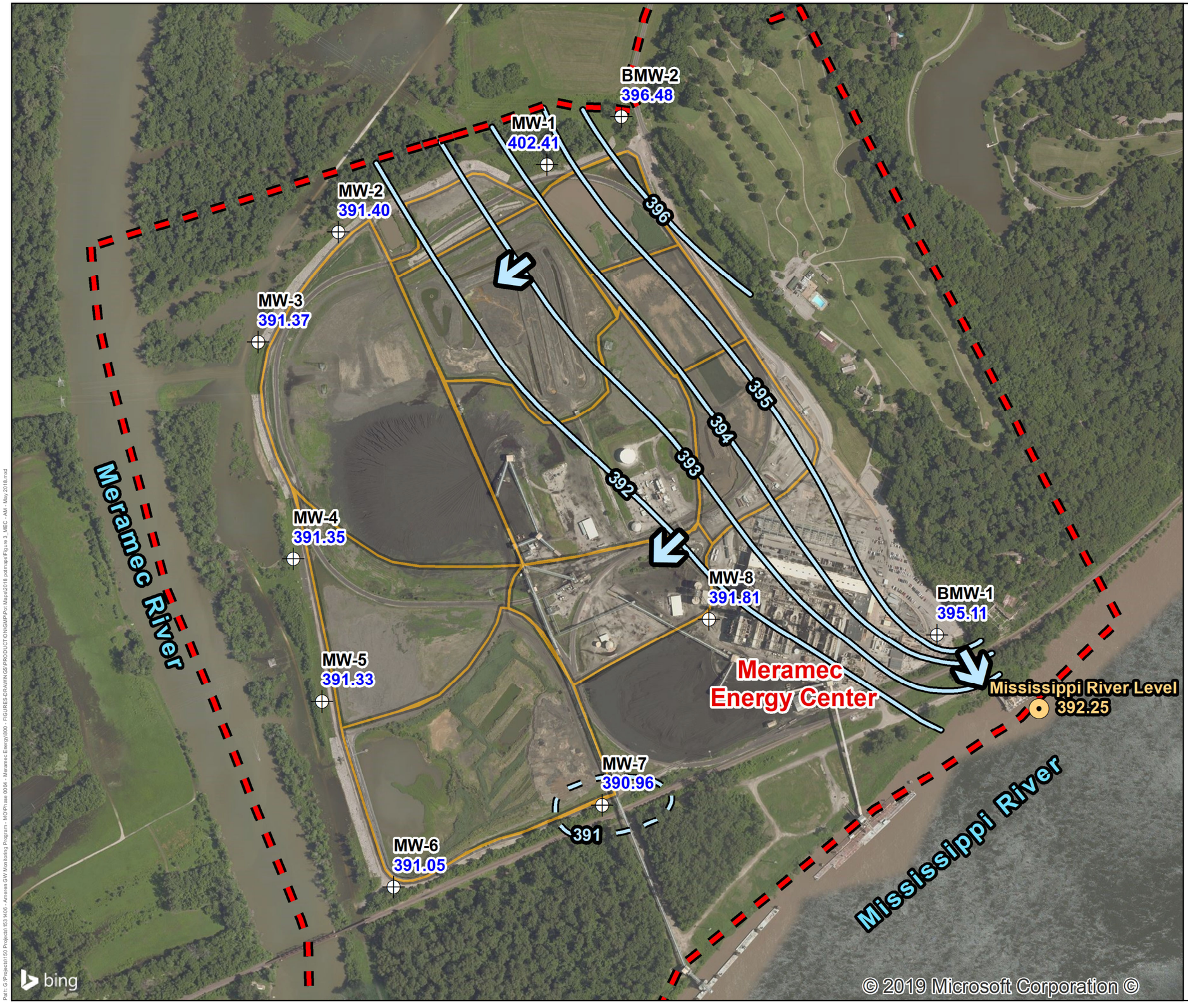
CONSULTANT
GOLDER

YYYY-MM-DD	2018-05-03
PREPARED	EFT
DESIGN	JSI
REVIEW	EMS/JSI
APPROVED	MNH

PROJECT No. 153-1406 | PHASE 0004 | Rev. 0.0 | FIGURE **C1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
1in
0

Path: G:\Projects\153 Projects\153-1406 - Ameren GW Monitoring Program - MO\Phase 0004 - Meramec Energy\800 - FIGURES-DRAWINGS\PRODUCTION\GMP\Plot Maps\2018 pot maps\Figure 2_MEC - AM - April - 2018.mxd



LEGEND

- Meramec Energy Center Property Boundary
- All Surface Impoundments

Groundwater Elevation Contours

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- Groundwater Monitoring Well
- Mississippi River Gauge
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KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
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4. WELL MW-1 NOT USED FOR POTENTIOMETRIC SURFACE MAP CONTOURING.
5. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
6. MISSISSIPPI RIVER AND POND LEVELS PROVIDED BY AMEREN.

REFERENCES

1.) AMEREN MISSOURI MERAMEC ENERGY CENTER, MERAMEC PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2401 FEET.

0 500 1,000 Feet

CLIENT
AMEREN MISSOURI
MERAMEC ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
POTENTIOMETRIC SURFACE MAP - MAY 17, 2018

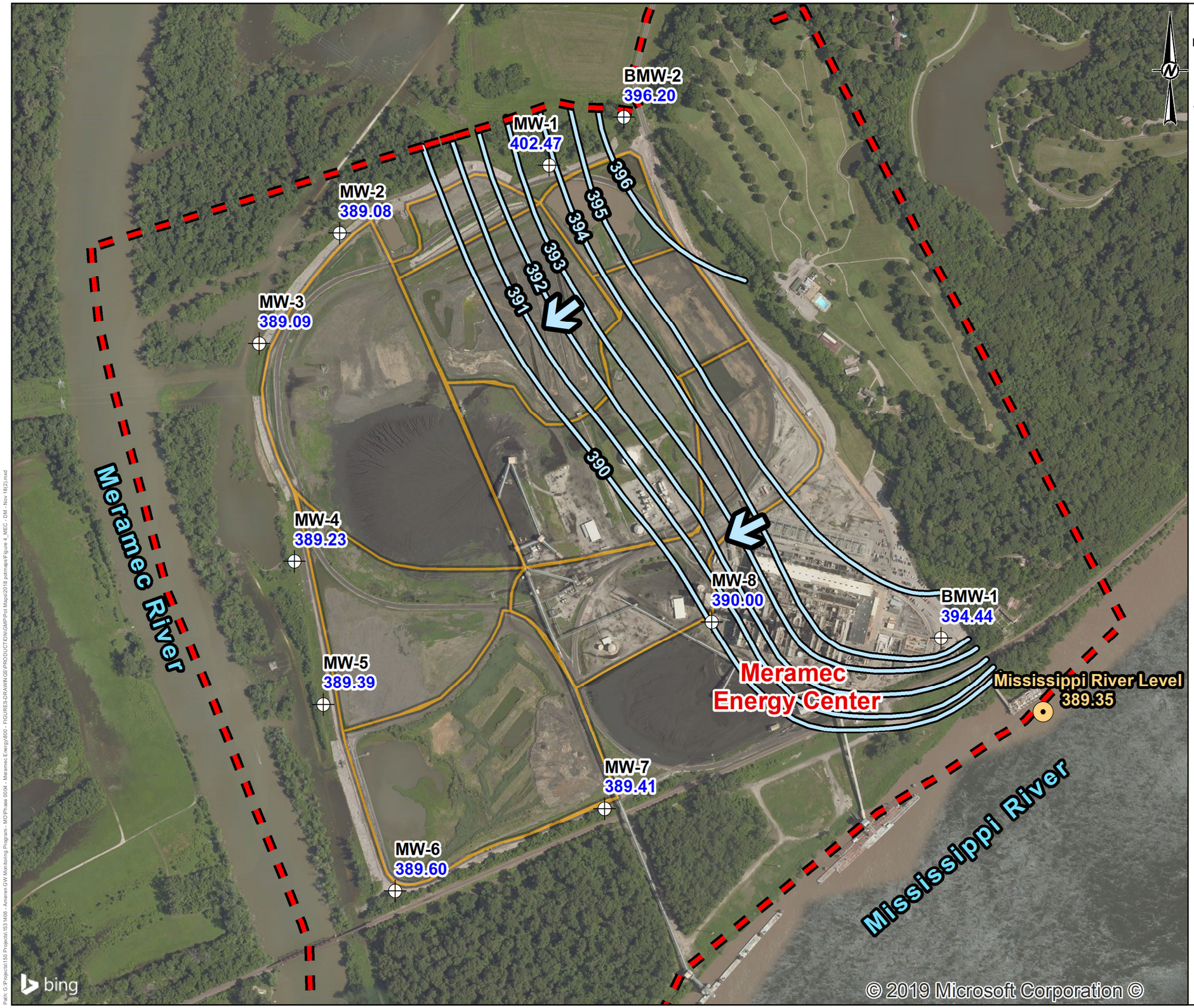
CONSULTANT
GOLDER

YYYY-MM-DD	2018-06-20
PREPARED	EFT
DESIGN	JSI
REVIEW	EMS/JSI
APPROVED	MNH

PROJECT No. 153-1406
PHASE 0004
FIGURE **C2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
1in
0

Path: G:\Projects\153 Projects\1531406 - Ameren GW Monitoring Program - MO\Phase 0004 - Meramec Energy\800 - FIGURES-DRAWINGS\PRODUCTION\GMP\Plot Maps\2018 pot maps\Figure 3_MEC - AM - May 2018.mxd



LEGEND

- Meramec Energy Center Property Boundary
- All Surface Impoundments

Groundwater Elevation Contours

- Groundwater Elevation Contour (FT MSL)

Ground/Surface Water Measurement Locations

- Groundwater Monitoring Well
- Mississippi River Gauge
- Groundwater Flow Direction

KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
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4. WELL MW-1 NOT USED FOR POTENTIOMETRIC SURFACE MAP CONTOURING.
5. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
6. MISSISSIPPI RIVER LEVEL PROVIDED BY AMEREN.

REFERENCES

1.) AMEREN MISSOURI MERAMEC ENERGY CENTER, MERAMEC PROPERTY CONTROL MAP, FEBRUARY 2011.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2401 FEET.

0 500 1,000 Feet

CLIENT
AMEREN MISSOURI
MERAMEC ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
POTENTIOMETRIC SURFACE MAP - NOVEMBER 19, 2018

CONSULTANT
GOLDER

YYYY-MM-DD	2018-12-21
PREPARED	EFT
DESIGN	JSI
REVIEW	JAP
APPROVED	MNH

PROJECT No. 153-1406
PHASE 0004
FIGURE C3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1in 0

Path: G:\Projects\153 Projects\153-1406 - Ameren\GW Monitoring Program - MO\Phase 0004 - Meramec Energy\800 - FIGURES\DRAWN\GIS\PRODUCTION\GMP\Pot Maps\2018 pot maps\Figure 4_MEC - DM - Nov 18(2).mxd

golder.com