GOLDER
MEMBER OF WSP

REPORT

2021 Annual Groundwater Monitoring and Corrective Action Report

LCL1 - Utility Waste Landfill Cell 1, Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

Ameren Missouri

1901 Chouteau Avenue, St. Louis, Missouri 63103

Submitted by:

Golder Associates Inc.

701 Emerson Road, Suite 250, Creve Coeur, Missouri, USA 63141

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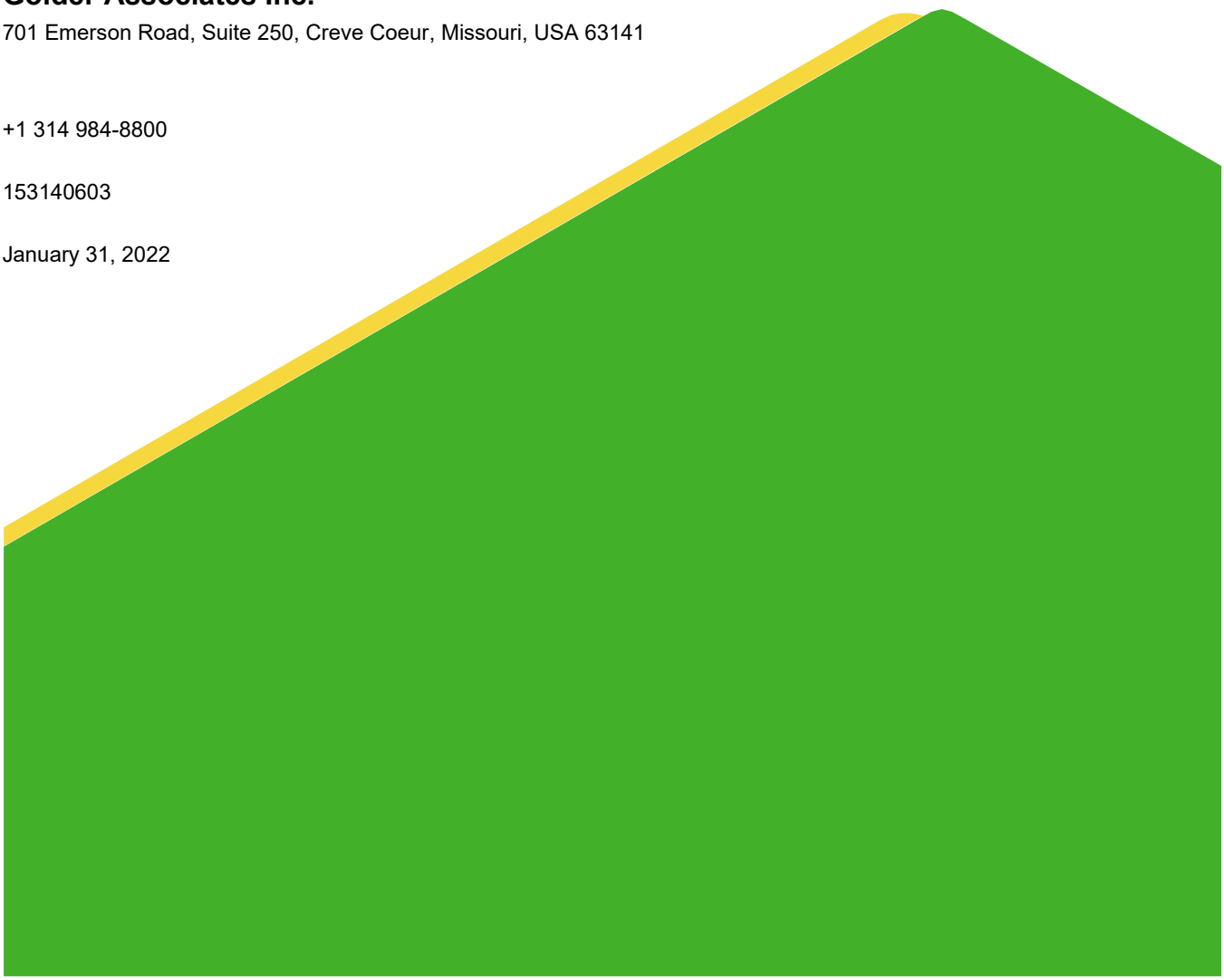
153140603

January 31, 2022



1.0 EXECUTIVE SUMMARY AND STATUS OF THE LCL1 GROUNDWATER MONITORING PROGRAM

This annual report was developed to meet the requirements of United States Environmental Protection Agency (USEPA) 40 CFR Part 257 “Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule” (the CCR Rule). The CCR Rule requires owners or operators of existing CCR units to produce an Annual Groundwater Monitoring and Corrective Action Report (Annual Report) each year (§§ 257.90(e)). Ameren Missouri (Ameren) has determined that the Utility Waste Landfill (UWL) at the Labadie Energy Center (LEC) is subject to the requirements of the CCR Rule. The UWL currently only operates LCL1 (Cell 1) which is an on-site landfill cell and manages Coal Combustion Residuals (CCR) from the facility. This Annual Report for the LCL1 describes CCR Rule groundwater monitoring activities from January 1, 2021, through December 31, 2021, including verification results related to late 2020 sampling.

Throughout 2021, the LCL1 CCR unit has been operating under the Detection Monitoring Program (§257.94) which began October 17, 2017. As a part of Detection Monitoring, statistical evaluations are completed after each sampling event to determine if there are any values that represent a Statistically Significant Increase (SSI) over background concentrations. In 2021, SSIs have been determined during each sampling event and a summary of the SSIs for the past year is provided in **Table 1**.

Table 1 – Summary of 2021 LCL1 Sampling Events, Previous Year Verification, and Statistical Evaluations

Event Name	Type of Event and Sampling Dates	Laboratory Analytical Data Receipt Date	Parameters Collected	Verified SSI	SSI Determination Date	ASD Completion Date
November 2020 Sampling Event	Detection Monitoring, November 2-3, 2020	December 11, 2020	Appendix III, Major Cations and Anions	**Calcium:** TMW-2 **Chloride:** TMW-2 **Sulfate:** TMW-2 **TDS:** TMW-2	March 11, 2021	June 9, 2021
	Verification Sampling, January 5-6, 2021	January 14, 2021	Detected Appendix III Parameters (See Note 1)			
February/April 2021 Sampling Event	Detection Monitoring, February 18 & April 16-19, 2021	March 11 and June 2, 2021	Appendix III, Major Cations and Anions	**Chloride:** MW-26	August 31, 2021	November 29, 2021
	Verification Sampling, June 7, 2021	June 21, 2021	Detected Appendix III Parameters (See Note 1)			
November 2021 Sampling Event	Detection Monitoring, November 1-4, 2021	December 28, 2021	Appendix III, Major Cations and Anions	To be determined after statistical analyses and Verification Sampling are completed in 2022.		

Notes:
1) Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
2) Background monitoring wells BMW-1S and BMW-2S were sampled in February 2021 for statistical analysis purposes. The remaining LCL1 monitoring wells were sampled during April 2021.
3) SSI – Statistically Significant Increase.
4) ASD – Alternative Source Demonstration.
5) TDS – Total Dissolved Solids.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Alternative Source Demonstrations were prepared for each of these sampling events and are discussed further in this Annual Report.

There were no changes made to the monitoring system in 2021 with no new wells being installed or decommissioned.

Table of Contents

2.0 INSTALLATION OR DECOMMISSIONING OF MONITORING WELLS

In accordance with the CCR Rule, a groundwater monitoring system has been installed to monitor the LCL1. The groundwater monitoring system consists of six (6) groundwater monitoring wells screened in the uppermost aquifer and is displayed in **Figure 1**. No new monitoring wells were installed or decommissioned in 2021 as a part of the CCR Rule monitoring program for the LCL1. For more information on the groundwater monitoring network, details are provided in the previous Annual Groundwater Monitoring Reports for the LCL1.

3.0 GROUNDWATER SAMPLING RESULTS AND DISCUSSION

The following sections discuss the sampling events completed for the LCL1 CCR Unit in 2021. **Table 2** below provides a summary of the groundwater samples collected in 2021 including the number of samples, the date of sample collection, and the monitoring program.

Table 2 – Summary of Groundwater Sampling Dates

Sampling Event	Groundwater Monitoring Wells						Monitoring Program
	BMW-1S	BMW-2S	MW-26	TMW-1	TMW-2	TMW-3	
	Date of Sample Collection						
January 2021 Verification Sampling	-	-	-	1/6/2021	1/5/2021	1/6/2021	Detection
February-April 2021 Detection Monitoring	2/18/2021	2/18/2021	4/16/2021	4/19/2021	4/19/2021	4/19/2021	Detection
June 2021 Verification Sampling	-	-	6/7/2021	6/7/2021	6/7/2021	6/7/2021	Detection
November 2021 Detection Monitoring	11/1/2021	11/1/2021	11/4/2021	11/2/2021	11/2/2021	11/2/2021	Detection
Total Number of Samples Collected	2	2	3	4	4	4	NA

Notes:
1.) Detection Monitoring Events tested for Appendix III Parameters.
2.) Verification Sampling Events tested for Appendix III Parameters above the prediction limit for that analyte/well.
3.) "-" No sample collected.
4.) NA – Not applicable.
5.) Background monitoring wells were sampled in February 2021 for statistical analysis.

3.1 Detection Monitoring Program

A Detection Monitoring sampling event was completed November 2-3, 2020. Verification sampling and the statistical analysis to evaluate for SSIs for the November 2020 event were not completed until 2021 and are therefore included in this report. Detections of Appendix III analytes triggered a verification sampling event, which was completed on January 5-6, 2021, and verified SSIs. **Table 3** summarizes the results of the statistical analysis of the November 2020 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

As outlined in section 257.94(e)(2) of the CCR Rule, the owner or operator may demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. An ASD was completed for these SSIs and is provided in **Appendix B**. This ASD demonstrates that SSIs at the monitoring wells around LCL1 are not caused by the LCL1 CCR Unit and the LCL1 CCR Unit remains in Detection Monitoring.

Detection Monitoring samples were collected at background monitoring wells BMW-1S and BMW-2S on February 18, 2021, and at monitoring wells MW-26, and TMW-1, TMW-2, and TMW-3 from April 16-19, 2021. Testing was completed for all Appendix III analytes, as well as major cations and anions. Detections of Appendix III analytes triggered Verification Sampling, which was completed June 7, 2021, and the testing results verified one SSI. **Table 4** summarizes the results of the statistical analysis of the February - April 2021 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**. As with the November 2020 sampling event, the SSI reported for the monitoring data was not caused by the LCL1 CCR Unit and an ASD for this is provided in **Appendix C**.

As outlined in the Statistical Analysis Plan for this site, updates to the statistical limits are completed once four (4) to eight (8) new sample results are available. After statistical analysis of the February-April 2021 sampling event, the statistical limits used to determine an SSI were updated according to the Statistical Analysis Plan. These updated limits will be used for November 2021 and subsequent statistical analyses.

A Detection Monitoring sampling event was completed November 1-4, 2021, and testing was performed for all Appendix III analytes as well as major cations and anions. Statistical analyses to evaluate for SSIs in the November 2021 data were not completed in 2021 and the results will be provided in the 2022 Annual Report. **Table 5** summarizes the results of the November 2021 Detection Monitoring event and laboratory analytical data are provided in **Appendix A**.

3.2 Groundwater Elevation, Flow Rate and Direction

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

Groundwater elevations were used to generate potentiometric surface maps included in **Appendix D**. As shown on the potentiometric surface maps, groundwater flow direction within the uppermost aquifer is dynamic and influenced by seasonal changes in the water level in the adjacent Missouri River. Water flows into and out of the alluvial aquifer because of fluctuating river water levels that produce “bank recharge” and “bank discharge” conditions. Overall, based on the potentiometric surface maps, a general flow direction from the south/southwest (bluffs area) to the north/northeast (Missouri River) is observed under normal river conditions. However, during periods of high river levels, groundwater flow can temporarily reverse. During these times of high river stage and

temporary flow direction changes, horizontal groundwater gradients generally decrease, and little net movement of groundwater occurs.

Groundwater flow direction and hydraulic gradient were estimated for the alluvial aquifer wells at the LEC using commercially available software. Results from this assessment indicate that while groundwater flow direction is variable, the overall net groundwater flow in the alluvial aquifer at the LEC is from the bluffs toward the river. Horizontal gradients calculated by the program range from 0.0001 to 0.0008 feet/foot with an estimated net annual groundwater movement of approximately 18 feet in the prevailing downgradient direction.

3.3 Sampling Issues

No notable sampling issues were encountered at the LCL1 in 2021.

4.0 ACTIVITIES PLANNED FOR 2022

Detection Monitoring is scheduled to continue on a semi-annual basis in the second and fourth quarters of 2022. Statistical analysis of the November 2021 Detection Monitoring data will be completed in 2022 and included in the 2022 Annual Report.

Tables

Table 3
November 2020 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
November 2020 Detection Monitoring Event											
DATE	NA	11/2/2020	11/2/2020	NA	11/2/2020	NA	11/3/2020	NA	11/3/2020	NA	11/3/2020
pH	SU	6.87	7.23	6.02-7.44	7.00	6.623-7.19	6.95	6.42-7.17	6.89	5.83-7.07	6.84
BORON, TOTAL	µg/L	99.0 J	45.2 J	DQR	63.6 J	139.7	103	136.3	132	139.7	128
CALCIUM, TOTAL	µg/L	216,000	142,000	182,000	119,000	177,907	142,000 J	195,768	197,000	208,416	172,000
CHLORIDE, TOTAL	mg/L	6.4	3.4	5.922	5.9	4.246	1.8	7.116	8.2	8.166	5.3
FLUORIDE, TOTAL	mg/L	0.17 J	0.22	0.2237	0.22	0.2916	0.33	0.2707	0.25	DQR	0.27
SULFATE, TOTAL	mg/L	66.5	73.4	33.4	29.8	122.2	30.9	109.9	116.0	109.6	56.1
TOTAL DISSOLVED SOLIDS	mg/L	780	524	520.2	420	733.7	579	767.8	801	756.6	651
January 2021 Verification Sampling Event											
DATE	NA						1/6/2021		1/5/2021		1/6/2021
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L								207,000		
CHLORIDE, TOTAL	mg/L								11.8		
FLUORIDE, TOTAL	mg/L						0.21				0.17 J
SULFATE, TOTAL	mg/L								150		
TOTAL DISSOLVED SOLIDS	mg/L								837		

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. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

Table 4
February-April 2021 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
February - April 2021 Detection Monitoring Event											
DATE	NA	2/18/2021	2/18/2021	NA	4/16/2021	NA	4/19/2021	NA	4/19/2021	NA	4/19/2021
pH	SU	6.73	7.16	6.02-7.44	7.03	6.623-7.19	7.07	6.42-7.17	6.96	5.83-7.07	6.90
BORON, TOTAL	µg/L	97.3 J	42.0 J	DQR	164	139.7	108	136.3	98.3 J	139.7	120
CALCIUM, TOTAL	µg/L	212,000	133,000	182,000	138,000	177,907	176,000	195,768	198,000	208,416	177,000
CHLORIDE, TOTAL	mg/L	5.1	4.0	5.922	7.7	4.246	3.9 J	7.116	6.3	8.166	5.5
FLUORIDE, TOTAL	mg/L	ND	0.14 J	0.2237	0.29	0.2916	0.29	0.2707	ND	DQR	ND
SULFATE, TOTAL	mg/L	70.4	60.6	33.4	24.1	122.2	78.7	109.9	103	109.6	52.2
TOTAL DISSOLVED SOLIDS	mg/L	792	483	520.2	512	733.7	735	767.8	750	756.6	829
June 2021 Verification Sampling Event											
DATE	NA				6/7/2021		6/7/2021		6/7/2021		6/7/2021
pH	SU										
BORON, TOTAL	µg/L				82.5 J						
CALCIUM, TOTAL	µg/L								185,000		
CHLORIDE, TOTAL	mg/L				6.3 J						
FLUORIDE, TOTAL	mg/L				0.15 J						
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L						630				596

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. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
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.
9. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

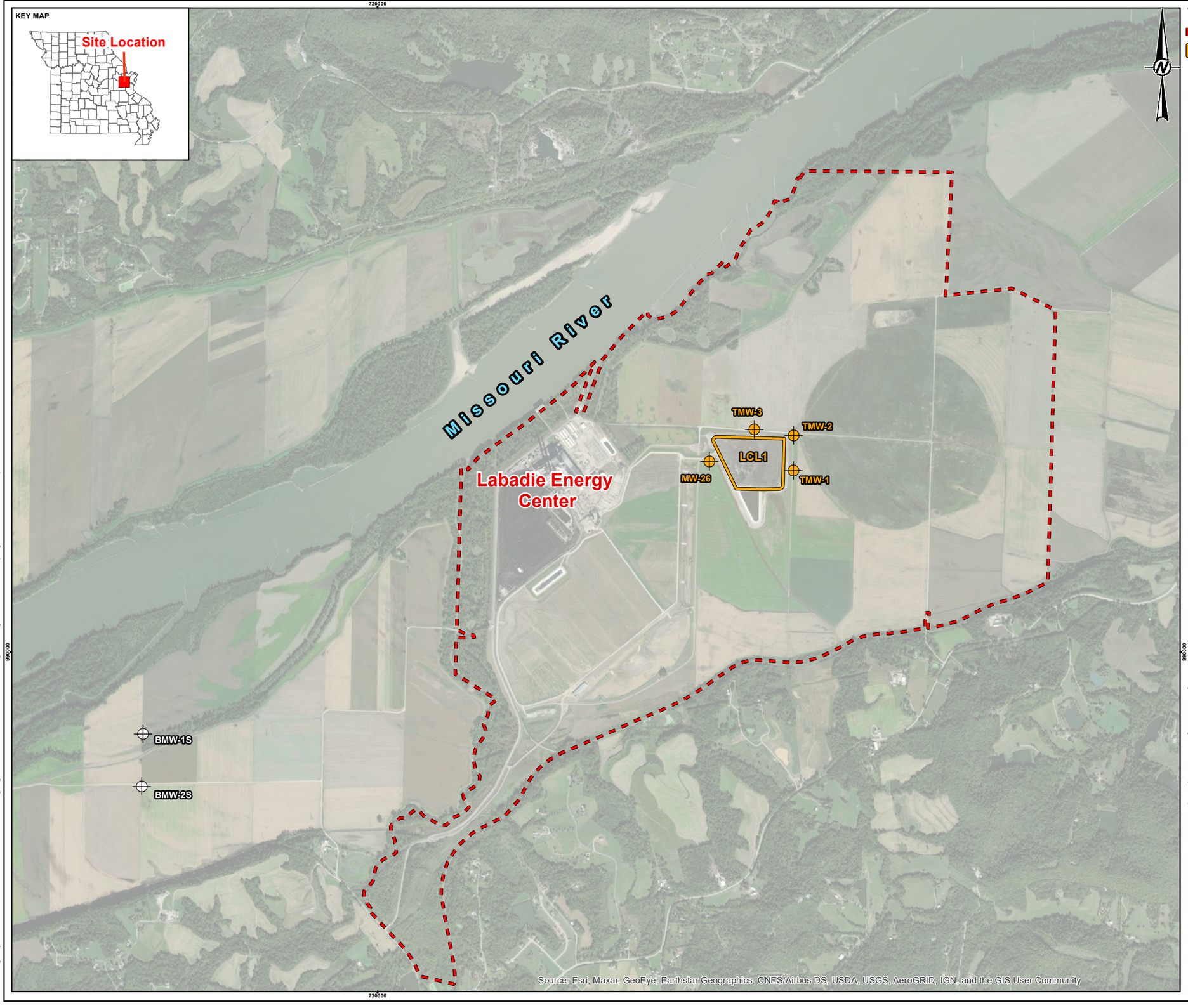
Table 5
November 2021 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS			
ANALYTE	UNITS	BMW-1S	BMW-2S	MW-26	TMW-1	TMW-2	TMW-3
November 2021 Detection Monitoring Event							
DATE	NA	11/1/2021	11/1/2021	11/4/2021	11/2/2021	11/2/2021	11/2/2021
pH	SU	6.68	6.97	6.81	6.89	6.87	6.73
BORON, TOTAL	µg/L	77.0 J	40.7 J	68.7 J	113	119	116
CALCIUM, TOTAL	µg/L	260,000	140,000	146,000	161,000	240,000	161,000
CHLORIDE, TOTAL	mg/L	13.7	1.7 J	6.2 J	2.6 J	19.7	3.8 J
FLUORIDE, TOTAL	mg/L	ND	0.14 J	0.24	0.27	0.25	0.20
SULFATE, TOTAL	mg/L	146	46.2	29.3	61.4	259	40.3
TOTAL DISSOLVED SOLIDS	mg/L	953 J	475 J	490	617	960	595

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. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.

Prepared By: GTM
Checked By: BTT
Reviewed By: MNH

Figures



LEGEND

- Approximate Property Boundary
- LCL1 - Utility Waste Landfill Cell 1

LCL1 Monitoring Wells

- LCL1 - Utility Waste Landfill Cell 1 Monitoring Well
- Background Monitoring Well

0 1,000 2,000 3,000 4,000
Feet

NOTE(S)
1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.

REFERENCE(S)
1.) ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE LOCATION AERIAL MAP AND MONITORING WELL LOCATIONS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-12-21
DESIGNED	JSI
PREPARED	BTT
REVIEWED	JSI
APPROVED	MNH

PROJECT NO. 153140603 | CONTROL 1240 | FIGURE 1

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

PATH: C:\Users\gmorey\Golder Associates\153140601-02 - Ameren CCR GW Monitoring Program 2020 - APP5 Technical Work\0001-LEC\5.5-Figures-Drawings\PRODUCTION\Other Maps\Figure 1 - 2021 LEC AI Wells Map - LCL1.mxd PRINTED ON: 2022-01-20 AT 9:29:05 AM

APPENDIX A

Laboratory Analytical Data

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

January 14, 2021

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

RE: Project: AMEREN LCL1
Pace Project No.: 60358559

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on January 07, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

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
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates

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

CERTIFICATIONS

Project: AMEREN LCL1
Pace Project No.: 60358559

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: AMEREN LCL1
Pace Project No.: 60358559

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60358559001	**L-TMW-1**	Water	01/06/21 11:00	01/07/21 04:40
60358559002	**L-TMW-2**	Water	01/05/21 15:40	01/07/21 04:40
60358559003	**L-TMW-3**	Water	01/06/21 12:13	01/07/21 04:40
60358559004	**L-UWL-DUP-1**	Water	01/05/21 08:00	01/07/21 04:40
60358559005	**L-UWL-FB-1**	Water	01/06/21 11:25	01/07/21 04:40

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SAMPLE ANALYTE COUNT

Project: AMEREN LCL1
Pace Project No.: 60358559

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60358559001	**L-TMW-1**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60358559002	**L-TMW-2**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60358559003	**L-TMW-3**	EPA 300.0	CRN2	1	PASI-K
60358559004	**L-UWL-DUP-1**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60358559005	**L-UWL-FB-1**	EPA 200.7	MRV	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60358559

Sample: L-TMW-1 **Lab ID: 60358559001** Collected: 01/06/21 11:00 Received: 01/07/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**175000**	ug/L	200	32.4	1	01/08/21 12:35	01/11/21 14:30	7440-70-2	M1
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**707**	mg/L	10.0	10.0	1		01/13/21 09:58		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.1**	mg/L	1.0	0.36	1		01/11/21 18:23	16887-00-6	
Fluoride	**0.21**	mg/L	0.20	0.085	1		01/11/21 18:23	16984-48-8	
Sulfate	**83.1**	mg/L	10.0	4.2	10		01/11/21 19:10	14808-79-8	

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60358559

Sample: L-TMW-2 **Lab ID: 60358559002** Collected: 01/05/21 15:40 Received: 01/07/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**207000**	ug/L	200	32.4	1	01/08/21 12:35	01/11/21 14:38	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**837**	mg/L	10.0	10.0	1		01/11/21 10:28		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**11.8**	mg/L	1.0	0.36	1		01/11/21 19:57	16887-00-6	
Fluoride	**0.15J**	mg/L	0.20	0.085	1		01/11/21 19:57	16984-48-8	M1
Sulfate	**150**	mg/L	10.0	4.2	10		01/11/21 20:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60358559

Sample: L-TMW-3 **Lab ID: 60358559003** Collected: 01/06/21 12:13 Received: 01/07/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Fluoride	**0.17J**	mg/L	0.20	0.085	1		01/11/21 21:31	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60358559

Sample: L-UWL-DUP-1 **Lab ID: 60358559004** Collected: 01/05/21 08:00 Received: 01/07/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**210000**	ug/L	200	32.4	1	01/08/21 12:35	01/11/21 14:41	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**842**	mg/L	10.0	10.0	1		01/11/21 10:28		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**11.4**	mg/L	1.0	0.36	1		01/11/21 22:02	16887-00-6	
Fluoride	**0.16J**	mg/L	0.20	0.085	1		01/11/21 22:02	16984-48-8	
Sulfate	**164**	mg/L	10.0	4.2	10		01/11/21 22:18	14808-79-8	

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60358559

Sample: L-UWL-FB-1 **Lab ID: 60358559005** Collected: 01/06/21 11:25 Received: 01/07/21 04:40 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7 Pace Analytical Services - Kansas City								
Calcium	**51.2J**	ug/L	200	32.4	1	01/08/21 12:35	01/11/21 14:44	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		01/13/21 09:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.36**	mg/L	1.0	0.36	1		01/11/21 22:34	16887-00-6	
Fluoride	**<0.085**	mg/L	0.20	0.085	1		01/11/21 22:34	16984-48-8	
Sulfate	**<0.42**	mg/L	1.0	0.42	1		01/11/21 22:34	14808-79-8	

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60358559

QC Batch: 698560 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358559001, 60358559002, 60358559004, 60358559005

METHOD BLANK: 2818202 Matrix: Water
Associated Lab Samples: 60358559001, 60358559002, 60358559004, 60358559005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	<32.4	200	32.4	01/11/21 13:58	

LABORATORY CONTROL SAMPLE: 2818203

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2818204 2818205

Parameter	Units	60358559001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	175000	10000	10000	175000	176000	0	7	70-130	0	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2818209 2818210

Parameter	Units	60358561003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	192000	10000	10000	194000	201000	19	95	70-130	4	20	M1

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60358559

QC Batch: 698684
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358559002, 60358559004

METHOD BLANK: 2818810 Matrix: Water
Associated Lab Samples: 60358559002, 60358559004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/11/21 10:26	

LABORATORY CONTROL SAMPLE: 2818811

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

SAMPLE DUPLICATE: 2818812

Parameter	Units	60358228001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3290	3090	6	10	

SAMPLE DUPLICATE: 2818813

Parameter	Units	60358561003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	974	997	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60358559

QC Batch: 698750
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358559001, 60358559005

METHOD BLANK: 2819086 Matrix: Water
Associated Lab Samples: 60358559001, 60358559005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	01/13/21 09:58	

LABORATORY CONTROL SAMPLE: 2819087

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

SAMPLE DUPLICATE: 2819090

Parameter	Units	60358558002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	983	1030	5	10	

SAMPLE DUPLICATE: 2819091

Parameter	Units	60358559001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	707	719	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60358559

QC Batch: 698603
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60358559001, 60358559002, 60358559003, 60358559004, 60358559005

METHOD BLANK: 2818358 Matrix: Water
Associated Lab Samples: 60358559001, 60358559002, 60358559003, 60358559004, 60358559005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.36	1.0	0.36	01/11/21 15:17	
Fluoride	mg/L	<0.085	0.20	0.085	01/11/21 15:17	
Sulfate	mg/L	<0.42	1.0	0.42	01/11/21 15:17	

METHOD BLANK: 2820471 Matrix: Water
Associated Lab Samples: 60358559001, 60358559002, 60358559003, 60358559004, 60358559005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.36	1.0	0.36	01/12/21 09:08	
Fluoride	mg/L	<0.085	0.20	0.085	01/12/21 09:08	
Sulfate	mg/L	<0.42	1.0	0.42	01/12/21 09:08	

LABORATORY CONTROL SAMPLE: 2818359

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

LABORATORY CONTROL SAMPLE: 2820472

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2818360 2818361

Parameter	Units	60358559001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.1	5	5	6.2	6.3	82	84	80-120	1	15	
Fluoride	mg/L	0.21	2.5	2.5	2.2	2.3	81	83	80-120	2	15	
Sulfate	mg/L	83.1	50	50	135	134	105	102	80-120	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60358559

MATRIX SPIKE SAMPLE: 2818362

Parameter	Units	60358559002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	11.8	5	16.5	93	80-120	
Fluoride	mg/L	0.15J	2.5	2.1	79	80-120	M1
Sulfate	mg/L	150	50	199	97	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LCL1
Pace Project No.: 60358559

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.

ANALYTE QUALIFIERS

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 LCL1
Pace Project No.: 60358559

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60358559001	**L-TMW-1**	EPA 200.7	698560	EPA 200.7	698593
60358559002	**L-TMW-2**	EPA 200.7	698560	EPA 200.7	698593
60358559004	**L-UWL-DUP-1**	EPA 200.7	698560	EPA 200.7	698593
60358559005	**L-UWL-FB-1**	EPA 200.7	698560	EPA 200.7	698593
60358559001	**L-TMW-1**	SM 2540C	698750		
60358559002	**L-TMW-2**	SM 2540C	698684		
60358559004	**L-UWL-DUP-1**	SM 2540C	698684		
60358559005	**L-UWL-FB-1**	SM 2540C	698750		
60358559001	**L-TMW-1**	EPA 300.0	698603		
60358559002	**L-TMW-2**	EPA 300.0	698603		
60358559003	**L-TMW-3**	EPA 300.0	698603		
60358559004	**L-UWL-DUP-1**	EPA 300.0	698603		
60358559005	**L-UWL-FB-1**	EPA 300.0	698603		

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Sample Condition Upon Receipt

WO# : 60358559

60358559

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 ☑ BPLC

Thermometer Used: T2616 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 15,1.7 **Corr. Factor** -0.1 **Corrected** 1.3, 1.5

Date and initials of person examining contents: 01072 1 ML

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	Limited volume - 1 BP2U
Correct containers used:	☑Yes ☐No ☐N/A	for TDS + anions
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) LOT# 603173	☑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:

REVIEWED
By jchurch at 3:53 pm, 1/7/21

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:

Company:	Golder Associates
Address:	13515 Barrett Parkway Drive, Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren LCLI
Project Number:	153140602

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	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	200.7 Boron	200.7 Calcium	Chloride	Fluoride	Sulfate	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N		10035859
1	L-TMW-1	WT	G			1/6/21	1100		2	1		1							/	/	/	/	/			
2	L-TMW-2	WT	G			1/5/21	1540		2	1		1							/	/	/	/	/			
3	L-TMW-3	WT	G			1/6/21	1213		1	1												/				
4	L-UWL-DUP-1	WT	G			1/5/21	—		2	1		1							/	/	/	/	/			
5	L-UWL-FB-1	WT	G			1/6/21	1125		2	1		1							/	/	/	/	/			
6	L-UWL-MS-1	WT	G			1/6/21	1100		2	1		1							/	/	/	/	/			MS/MSD taken @ TMW-1
7	L-UWL-MSD-1	WT	G			1/6/21	1100		2	1		1								/	/	/	/	/			↓
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			
	[signature]/Golder	1/6/21	1750	[signature]/Pace	1/07/21	0440	1.3	Y	Y	Y
							1.5	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 01/06/21

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

DMEMORANDUM

DATE January 19, 2021 **Project No.** 153140602

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – VERIFICATION SAMPLING - DATA PACKAGE 60358559

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When matrix spike/matrix spike duplicate (MS/MSD) criterion was not met, the associated sample result was qualified as an estimate (J).

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QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Company Name: Golder Associates Inc.
Project Manager: J. Ingram
Project Name: Ameren - LEC - LCP1
Project Number: 153140602
Reviewer: A. Muehlfarth
Validation Date: 01/19/2021

Laboratory: Pace Analytical Services, LLC
SDG #: 60358559
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-UWL-FB-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			01/05/2021 - 01/6/2021
b) Sampling team indicated?	x			BTT
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

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

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

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)?	☒	☐	☐	See Notes
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)?	☒	☐	☐	L-UWL-DUP-1 @ L-TMW-2
b) Were field dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 8.9% (<20%)
c) Were lab duplicates analyzed (note original and duplicate samples)?	☒	☐	☐	
d) Were lab dup. precision criteria met (note RPD)?	☒	☐	☐	Max RPD: 6% (<10%)

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:

The Sample Condition Upon Receipt Form states that they ran tests with limited volume (1 bottle for TDS and anions).

Sulfate analyzed at a dilution in L-TMW-1, L-TMW-2, L-UWL-DUP-1, no qualification necessary.

Field Blank:

L-UWL-FB-1 @ L-TMW-1: Calcium (51.2 J). Sample result > RL, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

MS/MSD:

2818204/2818205: MS/MSD % recovery low (<30%) for Calcium. Associated with sample 60358559001

2818209/2818210: MS % recovery low (<30%) for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

2818362: MS % recovery low for Fluoride. Associated with sample 60358559002.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-TMW-1	Calcium	175000	J-	MS/MSD % recovery <30%
L-TMW-2	Fluoride	0.15	J-	"

Signature: Ann Muhlfarth Date: 01/19/2021

Pace Analytical Services, LLC
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March 11, 2021

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

RE: Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on February 19, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

L-BMW-1S and L-BMW-2S moved from SDG 60361519 to 60363499A

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
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates

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CERTIFICATIONS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60361519003	**L-BMW-1S**	Water	02/18/21 11:25	02/19/21 03:53
60361519004	**L-BMW-2S**	Water	02/18/21 13:05	02/19/21 03:53

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60361519003	**L-BMW-1S**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	MAP	1	PASI-K
		SM 4500-S-2 D	MAP	1	PASI-K
		EPA 300.0	LDB	3	PASI-K
60361519004	**L-BMW-2S**	EPA 200.7	HKC	13	PASI-K
		EPA 200.8	JGP	6	PASI-K
		EPA 7470	JDE	1	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		SM 3500-Fe B#4	LDB	1	PASI-K
		SM 3500-Fe B#4	MAP	1	PASI-K
		SM 4500-S-2 D	MAP	1	PASI-K
		EPA 300.0	LDB	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Sample: L-BMW-1S **Lab ID: 60361519003** Collected: 02/18/21 11:25 Received: 02/19/21 03:53 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 Pace Analytical Services - Kansas City								
Barium	**347**	ug/L	5.0	1.8	1	02/19/21 13:31	02/22/21 13:26	7440-39-3	
Beryllium	**<0.39**	ug/L	1.0	0.39	1	02/19/21 13:31	02/22/21 13:26	7440-41-7	
Boron	**97.3J**	ug/L	100	8.6	1	02/19/21 13:31	02/22/21 13:26	7440-42-8	
Calcium	**212000**	ug/L	200	75.4	1	02/19/21 13:31	02/22/21 13:26	7440-70-2	
Cobalt	**1.9J**	ug/L	5.0	0.95	1	02/19/21 13:31	02/22/21 13:26	7440-48-4	
Iron	**26200**	ug/L	50.0	21.4	1	02/19/21 13:31	02/22/21 13:26	7439-89-6	
Lead	**<3.8**	ug/L	10.0	3.8	1	02/19/21 13:31	02/22/21 13:26	7439-92-1	
Lithium	**18.0**	ug/L	10.0	7.7	1	02/19/21 13:31	02/22/21 13:26	7439-93-2	
Magnesium	**43200**	ug/L	50.0	31.4	1	02/19/21 13:31	02/22/21 13:26	7439-95-4	
Manganese	**2570**	ug/L	5.0	0.74	1	02/19/21 13:31	02/22/21 13:26	7439-96-5	
Molybdenum	**<2.2**	ug/L	20.0	2.2	1	02/19/21 13:31	02/22/21 13:26	7439-98-7	
Potassium	**5560**	ug/L	500	146	1	02/19/21 13:31	02/22/21 13:26	7440-09-7	
Sodium	**15000**	ug/L	500	254	1	02/19/21 13:31	02/22/21 13:26	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Kansas City								
Antimony	**<0.10**	ug/L	1.0	0.10	1	02/19/21 13:31	02/22/21 14:36	7440-36-0	
Arsenic	**25.5**	ug/L	1.0	0.11	1	02/19/21 13:31	02/22/21 14:36	7440-38-2	
Cadmium	**<0.062**	ug/L	0.50	0.062	1	02/19/21 13:31	02/22/21 14:36	7440-43-9	
Chromium	**<0.23**	ug/L	1.0	0.23	1	02/19/21 13:31	02/22/21 14:36	7440-47-3	
Selenium	**<0.18**	ug/L	1.0	0.18	1	02/19/21 13:31	02/22/21 14:36	7782-49-2	
Thallium	**<0.094**	ug/L	1.0	0.094	1	02/19/21 13:31	02/22/21 14:36	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City								
Mercury	**<0.096**	ug/L	0.20	0.096	1	02/23/21 08:45	02/23/21 12:39	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**682**	mg/L	20.0	7.5	1		02/23/21 15:48		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**792**	mg/L	10.0	10.0	1		02/23/21 09:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4 Pace Analytical Services - Kansas City								
Iron, Ferric	**25.9**	mg/L	0.050		1		02/24/21 12:58	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4 Pace Analytical Services - Kansas City								
Iron, Ferrous	**0.23**	mg/L	0.20	0.048	1		02/22/21 09:05		H6

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Sample: L-BMW-1S **Lab ID: 60361519003** Collected: 02/18/21 11:25 Received: 02/19/21 03:53 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D Pace Analytical Services - Kansas City								
Sulfide, Total	**0.034J**	mg/L	0.050	0.026	1		02/20/21 09:14	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.1**	mg/L	1.0	0.39	1		02/22/21 19:16	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		02/22/21 19:16	16984-48-8	
Sulfate	**70.4**	mg/L	5.0	2.1	5		02/22/21 19:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Sample: L-BMW-2S **Lab ID: 60361519004** Collected: 02/18/21 13:05 Received: 02/19/21 03:53 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 Pace Analytical Services - Kansas City								
Barium	**237**	ug/L	5.0	1.8	1	02/19/21 13:31	02/22/21 13:29	7440-39-3	
Beryllium	**<0.39**	ug/L	1.0	0.39	1	02/19/21 13:31	02/22/21 13:29	7440-41-7	
Boron	**42.0J**	ug/L	100	8.6	1	02/19/21 13:31	02/22/21 13:29	7440-42-8	
Calcium	**133000**	ug/L	200	75.4	1	02/19/21 13:31	02/22/21 13:29	7440-70-2	
Cobalt	**<0.95**	ug/L	5.0	0.95	1	02/19/21 13:31	02/22/21 13:29	7440-48-4	
Iron	**30.9J**	ug/L	50.0	21.4	1	02/19/21 13:31	02/23/21 11:37	7439-89-6	
Lead	**<3.8**	ug/L	10.0	3.8	1	02/19/21 13:31	02/22/21 13:29	7439-92-1	
Lithium	**13.0**	ug/L	10.0	7.7	1	02/19/21 13:31	02/22/21 13:29	7439-93-2	
Magnesium	**20200**	ug/L	50.0	31.4	1	02/19/21 13:31	02/22/21 13:29	7439-95-4	
Manganese	**1.1J**	ug/L	5.0	0.74	1	02/19/21 13:31	02/22/21 13:29	7439-96-5	
Molybdenum	**<2.2**	ug/L	20.0	2.2	1	02/19/21 13:31	02/22/21 13:29	7439-98-7	
Potassium	**5560**	ug/L	500	146	1	02/19/21 13:31	02/22/21 13:29	7440-09-7	
Sodium	**4060**	ug/L	500	254	1	02/19/21 13:31	02/22/21 13:29	7440-23-5	
200.8 MET ICPMS	Analytical Method: EPA 200.8 Preparation Method: EPA 200.8 Pace Analytical Services - Kansas City								
Antimony	**0.24J**	ug/L	1.0	0.10	1	02/19/21 13:31	02/22/21 14:38	7440-36-0	
Arsenic	**0.54J**	ug/L	1.0	0.11	1	02/19/21 13:31	02/22/21 14:38	7440-38-2	
Cadmium	**<0.062**	ug/L	0.50	0.062	1	02/19/21 13:31	02/22/21 14:38	7440-43-9	
Chromium	**<0.23**	ug/L	1.0	0.23	1	02/19/21 13:31	02/22/21 14:38	7440-47-3	
Selenium	**2.4**	ug/L	1.0	0.18	1	02/19/21 13:31	02/22/21 14:38	7782-49-2	
Thallium	**<0.094**	ug/L	1.0	0.094	1	02/19/21 13:31	02/22/21 14:38	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City								
Mercury	**<0.096**	ug/L	0.20	0.096	1	02/23/21 08:45	02/23/21 12:46	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**365**	mg/L	20.0	7.5	1		02/23/21 15:54		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**483**	mg/L	10.0	10.0	1		02/23/21 09:12		
Iron, Ferric (Calculation)	Analytical Method: SM 3500-Fe B#4 Pace Analytical Services - Kansas City								
Iron, Ferric	**0.017J**	mg/L	0.050		1		02/24/21 12:58	7439-89-6	
Iron, Ferrous	Analytical Method: SM 3500-Fe B#4 Pace Analytical Services - Kansas City								
Iron, Ferrous	**<0.048**	mg/L	0.20	0.048	1		02/22/21 09:08		H6

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

ANALYTICAL RESULTS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Sample: L-BMW-2S **Lab ID: 60361519004** Collected: 02/18/21 13:05 Received: 02/19/21 03:53 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
4500S2D Sulfide, Total	Analytical Method: SM 4500-S-2 D Pace Analytical Services - Kansas City								
Sulfide, Total	**0.028J**	mg/L	0.050	0.026	1		02/20/21 09:14	18496-25-8	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**4.0**	mg/L	1.0	0.39	1		02/22/21 19:45	16887-00-6	
Fluoride	**0.14J**	mg/L	0.20	0.086	1		02/22/21 19:45	16984-48-8	
Sulfate	**60.6**	mg/L	5.0	2.1	5		02/22/21 20:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705266
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2840422 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	<0.096	0.20	0.096	02/23/21 12:21	

LABORATORY CONTROL SAMPLE: 2840423

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2840424 2840425

Parameter	Units	60361519003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	<0.096	5	5	4.8	4.9	96	97	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705001
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2839697 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Barium	ug/L	<1.8	5.0	1.8	02/22/21 13:11	
Beryllium	ug/L	<0.39	1.0	0.39	02/22/21 13:11	
Boron	ug/L	<8.6	100	8.6	02/22/21 13:11	
Calcium	ug/L	<75.4	200	75.4	02/22/21 13:11	
Cobalt	ug/L	<0.95	5.0	0.95	02/22/21 13:11	
Iron	ug/L	<21.4	50.0	21.4	02/22/21 13:11	
Lead	ug/L	<3.8	10.0	3.8	02/22/21 13:11	
Lithium	ug/L	<7.7	10.0	7.7	02/22/21 13:11	
Magnesium	ug/L	<31.4	50.0	31.4	02/22/21 13:11	
Manganese	ug/L	<0.74	5.0	0.74	02/22/21 13:11	
Molybdenum	ug/L	<2.2	20.0	2.2	02/22/21 13:11	
Potassium	ug/L	<146	500	146	02/22/21 13:11	
Sodium	ug/L	<254	500	254	02/22/21 13:11	

LABORATORY CONTROL SAMPLE: 2839698

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Barium	ug/L	1000	974	97	85-115	
Beryllium	ug/L	1000	980	98	85-115	
Boron	ug/L	1000	976	98	85-115	
Calcium	ug/L	10000	9950	100	85-115	
Cobalt	ug/L	1000	1010	101	85-115	
Iron	ug/L	10000	9930	99	85-115	
Lead	ug/L	1000	1010	101	85-115	
Lithium	ug/L	1000	984	98	85-115	
Magnesium	ug/L	10000	9950	100	85-115	
Manganese	ug/L	1000	964	96	85-115	
Molybdenum	ug/L	1000	1010	101	85-115	
Potassium	ug/L	10000	9880	99	85-115	
Sodium	ug/L	10000	9810	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839699 2839700

Parameter	Units	60361519001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Barium	ug/L	1080	1000	1000	2080	2100	100	102	70-130	1	20	
Beryllium	ug/L	<0.39	1000	1000	997	1020	100	102	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839699 2839700

Parameter	Units	60361519001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	78.1J	1000	1000	1080	1090	101	101	70-130	0	20	
Calcium	ug/L	133000	10000	10000	145000	146000	122	125	70-130	0	20	
Cobalt	ug/L	<0.95	1000	1000	1000	1010	100	101	70-130	1	20	
Iron	ug/L	10900	10000	10000	20700	20600	98	98	70-130	0	20	
Lead	ug/L	<3.8	1000	1000	988	999	99	100	70-130	1	20	
Lithium	ug/L	27.8	1000	1000	1030	1030	100	100	70-130	0	20	
Magnesium	ug/L	30000	10000	10000	40300	40000	104	100	70-130	1	20	
Manganese	ug/L	623	1000	1000	1600	1590	97	96	70-130	1	20	
Molybdenum	ug/L	<2.2	1000	1000	1040	1040	103	104	70-130	1	20	
Potassium	ug/L	4480	10000	10000	14800	15100	103	106	70-130	2	20	
Sodium	ug/L	10100	10000	10000	20000	20000	99	99	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705002
QC Batch Method: EPA 200.8
Analysis Method: EPA 200.8
Analysis Description: 200.8 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2839701 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	<0.10	1.0	0.10	02/22/21 14:29	
Arsenic	ug/L	<0.11	1.0	0.11	02/22/21 14:29	
Cadmium	ug/L	<0.062	0.50	0.062	02/22/21 14:29	
Chromium	ug/L	<0.23	1.0	0.23	02/22/21 14:29	
Selenium	ug/L	<0.18	1.0	0.18	02/22/21 14:29	
Thallium	ug/L	<0.094	1.0	0.094	02/22/21 14:29	

LABORATORY CONTROL SAMPLE: 2839702

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.5	99	85-115	
Arsenic	ug/L	40	41.1	103	85-115	
Cadmium	ug/L	40	40.3	101	85-115	
Chromium	ug/L	40	42.6	106	85-115	
Selenium	ug/L	40	40.8	102	85-115	
Thallium	ug/L	40	39.0	98	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839703 2839704

Parameter	Units	60361519002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	<0.10	40	40	38.8	38.7	97	97	70-130	0	20	
Arsenic	ug/L	35.7	40	40	77.2	77.1	104	104	70-130	0	20	
Cadmium	ug/L	<0.062	40	40	39.1	38.9	98	97	70-130	1	20	
Chromium	ug/L	0.34J	40	40	40.8	40.6	101	101	70-130	1	20	
Selenium	ug/L	<0.18	40	40	39.3	38.8	98	97	70-130	1	20	
Thallium	ug/L	<0.094	40	40	40.6	39.8	101	99	70-130	2	20	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705268
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2840426 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.5	20.0	7.5	02/23/21 15:15	

LABORATORY CONTROL SAMPLE: 2840427

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	524	105	90-110	

SAMPLE DUPLICATE: 2840428

Parameter	Units	60361519001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	440	430	2	10	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705155
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2840218 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	02/23/21 09:10	

LABORATORY CONTROL SAMPLE: 2840219

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1080	108	80-120	

SAMPLE DUPLICATE: 2840220

Parameter	Units	60361519001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	501	524	4	10	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705068
QC Batch Method: SM 3500-Fe B#4
Analysis Method: SM 3500-Fe B#4
Analysis Description: Iron, Ferrous
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2839984 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Iron, Ferrous	mg/L	<0.048	0.20	0.048	02/22/21 09:02	H6

LABORATORY CONTROL SAMPLE: 2839985

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Iron, Ferrous	mg/L	2	2.1	103	90-110	H6

SAMPLE DUPLICATE: 2839986

Parameter	Units	60361508014 Result	Dup Result	RPD	Max RPD	Qualifiers
Iron, Ferrous	mg/L	<0.20	0.18J		20	H6

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REPORT OF LABORATORY ANALYSIS

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9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 705038
QC Batch Method: SM 4500-S-2 D
Analysis Method: SM 4500-S-2 D
Analysis Description: 4500S2D Sulfide, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2839847 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Sulfide, Total	mg/L	<0.026	0.050	0.026	02/20/21 09:07	

LABORATORY CONTROL SAMPLE: 2839848

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	0.5	0.50	101	80-120	

MATRIX SPIKE SAMPLE: 2839849

Parameter	Units	60361426001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfide, Total	mg/L	0.43	0.5	0.91	97	75-125	

SAMPLE DUPLICATE: 2839850

Parameter	Units	60361519002 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	0.040J	0.041J		20	

SAMPLE DUPLICATE: 2839851

Parameter	Units	60361508016 Result	Dup Result	RPD	Max RPD	Qualifiers
Sulfide, Total	mg/L	<0.050	0.031J		20	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

QC Batch: 704993
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60361519003, 60361519004

METHOD BLANK: 2839665 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	02/22/21 12:03	
Fluoride	mg/L	<0.086	0.20	0.086	02/22/21 12:03	
Sulfate	mg/L	<0.42	1.0	0.42	02/22/21 12:03	

METHOD BLANK: 2840545 Matrix: Water
Associated Lab Samples: 60361519003, 60361519004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	02/23/21 09:13	
Fluoride	mg/L	<0.086	0.20	0.086	02/23/21 09:13	
Sulfate	mg/L	<0.42	1.0	0.42	02/23/21 09:13	

LABORATORY CONTROL SAMPLE: 2839666

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2839667 2839668

Parameter	Units	60361288001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	197	100	100	299	301	102	103	80-120	1	15	
Fluoride	mg/L	0.82	2.5	2.5	2.8	2.9	78	81	80-120	3	15	M1
Sulfate	mg/L	782	500	500	1260	1260	96	96	80-120	0	15	

SAMPLE DUPLICATE: 2839669

Parameter	Units	60361288001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	197	196	1	15	
Fluoride	mg/L	0.82	0.84	2	15	
Sulfate	mg/L	782	755	4	15	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

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.

ANALYTE QUALIFIERS

H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LABADIE LCL1
Pace Project No.: 60363499A

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60361519003	**L-BMW-1S**	EPA 200.7	705001	EPA 200.7	705058
60361519004	**L-BMW-2S**	EPA 200.7	705001	EPA 200.7	705058
60361519003	**L-BMW-1S**	EPA 200.8	705002	EPA 200.8	705059
60361519004	**L-BMW-2S**	EPA 200.8	705002	EPA 200.8	705059
60361519003	**L-BMW-1S**	EPA 7470	705266	EPA 7470	705327
60361519004	**L-BMW-2S**	EPA 7470	705266	EPA 7470	705327
60361519003	**L-BMW-1S**	SM 2320B	705268		
60361519004	**L-BMW-2S**	SM 2320B	705268		
60361519003	**L-BMW-1S**	SM 2540C	705155		
60361519004	**L-BMW-2S**	SM 2540C	705155		
60361519003	**L-BMW-1S**	SM 3500-Fe B#4	705571		
60361519004	**L-BMW-2S**	SM 3500-Fe B#4	705571		
60361519003	**L-BMW-1S**	SM 3500-Fe B#4	705068		
60361519004	**L-BMW-2S**	SM 3500-Fe B#4	705068		
60361519003	**L-BMW-1S**	SM 4500-S-2 D	705038		
60361519004	**L-BMW-2S**	SM 4500-S-2 D	705038		
60361519003	**L-BMW-1S**	EPA 300.0	704993		
60361519004	**L-BMW-2S**	EPA 300.0	704993		

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Sample Condition Upon Receipt

WO#: 60361519

60361519

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 ☑ Zplc

Thermometer Used: T295 **Type of Ice:** (Wet) Blue (None) Cooler #1 Cooler #2

Cooler Temperature (°C): **As-read** 0.9 **Corr. Factor** +0.2 **Corrected** 1.1

Temperature should be above freezing to 6°C 8.9 +0.2 9.1

Date and initials of person examining contents: 2/19/21 SP

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) LOT# Le223173 Le323222	☑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: _____

REVIEWED
By jchurch at 9:49 am, 2/19/21

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.

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman
Purchase Order No.:	COC #1
Project Name:	Ameren Labadie Energy Center LCPA
Project Number:	153140602.0001A

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 1

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	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226	Radium 226	Ferrous/Ferric Iron	SM4500-S2D Sulfide			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N →	N	N	N	N	N	N	N	N	N	N				
1	L-UMW-1D	WT	G																												LEU3U1519
2	L-UMW-2D	WT	G																												
3	L-UMW-3D	WT	G																												
4	L-UMW-4D	WT	G																												
5	L-UMW-5D	WT	G																												
6	L-UMW-6D	WT	G																												
7	L-UMW-7D	WT	G																												
8	L-UMW-8D	WT	G																												
9	L-UMW-9D	WT	G																												
10	L-BMW-1D	WT	G			2-18-21	1048		6	2		3					1		/	/	/	/	/	/	/	/	/	/			
11	L-BMW-2D	WT	G			⊥	~~1225~~ 1226		⊥	⊥		⊥					1		⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥	⊥			
12	L-UMW-DUP-1	WT	G																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
App III and Cat/An Metals - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B		2/18/21	1450	Angela Inc	2/18	1500				
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl	Angela M	2/18	1500	E Rhodes/Pace	2/18/21	0353	1.1	Y	Y	Y
				E Rhodes/Pace	2/19/21	0353	9.1	N	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schnieder

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 02/18/21

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.

Pace Analytical
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	Ballwin, MO 63021
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Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman
Purchase Order No.:	COC #1
Project Name:	Ameren Labadie Energy Center LCPA-CA
Project Number:	153140602.0001A

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 1

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	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	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Appendix IV Metals **	Mercury	Radium 226	Radium 226	Ferrous/Ferric Iron	SM4500-S2D Sulfide			Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N	N	N				
1	L-UMW-1D	WT	G																												
2	L-UMW-2D	WT	G																												
3	L-UMW-3D	WT	G																												
4	L-UMW-4D	WT	G																												
5	L-UMW-5D	WT	G																												
6	L-UMW-6D	WT	G																												
7	L-UMW-7D	WT	G																												
8	L-UMW-8D	WT	G																												
9	L-UMW-9D	WT	G																												
10	L-BMW-1S	WT	G			2-18-21	1125		6	2		3					1		/	/	/	/	/	/	/	/	/	/				
11	L-BMW-2S	WT	G			1	1305		1	1		1					1		1	1	1	1	1	1	1	1	1	1				
12	L-UMW-DUP-1	WT	G																												

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
App III and Cat/An Metals - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Eric Schnieder/Golder	2/18/21	1450	Angela Mena	2/18	1500				
**- App IV Metals - EPA 200.7 - Ba, Be, Co, Pb, Li, Mo 200.8 Metals - Sb, As, Cd, Cr, Se, Tl	Angela Mena	2/18/21		Schnieder/Pace	2/19/21	0353	1.1	Y	Y	Y
							9.1	N	Y	Y

SAMPLER NAME AND SIGNATURE			
PRINT Name of SAMPLER:	Eric Schnieder		
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):	02/18/21

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.

MEMORANDUM

DATE March 16, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – BACKGROUND SAMPLES - DATA PACKAGE 60363499A

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

- When a compound was detected in a sample result between the MDL and the PQL the results were recorded at the detection value and qualified as estimates (J).
- When a compound was analyzed outside of hold time 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 - LEC - LCL1
Project Number: 153140603
Reviewer: A. Muehlfarth
Validation Date: 03/16/2021

Laboratory: Pace Analytical Services, LLC
SDG #: 60363499A
Analytical Method (type and no.): EPA 200.7/200.8 (Total Metals); EPA 7470 (Mercury); SM2320B (Alkalinity); SM2540C (TDS); SM 3500-FE B#4 (Ferric/Ferrous Iron); SM 4500-S-2-D (Total Sulfide); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐ _____
Sample Names: L-BMW-1S, L-BMW-2S

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?	x			2/18/2021
b) Sampling team indicated?	x			EMS
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?		x		
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies: _____

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

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

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)?				
	☐	☒	☐	
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)?	☒	☐	☐	Max RPD: 4% (<10%)

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

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

Comments/Notes:

Ferrous Iron analyzed outside of hold time in all samples.

Dilutions: Sulfate was diluted in all samples, no qualification necessary.

MS/MSD:

2839667/2839668: MS % recovery low for Fluoride. MS/MSD performed on an unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-BMW-1S	Ferrous Iron	0.23	J	Analyzed outside of hold time
L-BMW-2S	"	0.048	UJ	Analyzed outside of hold time, non-detect

Signature: Ann Muehlfarth Date: 03/16/2021

Pace Analytical Services, LLC
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June 02, 2021

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

RE: Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between April 17, 2021 and April 21, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

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
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

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CERTIFICATIONS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60367255001	**L-TMW-1**	Water	04/19/21 13:05	04/21/21 03:49
60367255002	**L-TMW-2**	Water	04/19/21 11:55	04/21/21 03:49
60367255003	**L-TMW-3**	Water	04/19/21 14:55	04/21/21 03:49
60367255004	**L-UWL-DUP-1**	Water	04/19/21 00:00	04/21/21 03:49
60367255005	**L-UWL-FB-1**	Water	04/19/21 15:19	04/21/21 03:49
60366962013	**L-MW-26**	Water	04/16/21 11:16	04/17/21 03:35

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SAMPLE ANALYTE COUNT

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60367255001	**L-TMW-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	LDB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60367255002	**L-TMW-2**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	LDB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60367255003	**L-TMW-3**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	LDB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60367255004	**L-UWL-DUP-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	LDB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60367255005	**L-UWL-FB-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	LDB	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K
60366962013	**L-MW-26**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	MAP	1	PASI-K
		SM 2540C	VRP	1	PASI-K
		EPA 300.0	CRN2	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-TMW-1 **Lab ID: 60367255001** Collected: 04/19/21 13:05 Received: 04/21/21 03:49 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 Pace Analytical Services - Kansas City								
Boron	**108**	ug/L	100	8.6	1	04/27/21 14:38	05/06/21 21:46	7440-42-8	
Calcium	**176000**	ug/L	200	75.4	1	04/27/21 14:38	05/06/21 21:46	7440-70-2	M1
Iron	**3680**	ug/L	50.0	21.4	1	04/27/21 14:38	05/06/21 21:46	7439-89-6	
Magnesium	**45700**	ug/L	50.0	31.4	1	04/27/21 14:38	05/06/21 21:46	7439-95-4	
Manganese	**8230**	ug/L	5.0	0.74	1	04/27/21 14:38	05/06/21 21:46	7439-96-5	M1
Potassium	**5550**	ug/L	500	146	1	04/27/21 14:38	05/06/21 21:46	7440-09-7	
Sodium	**11500**	ug/L	500	254	1	04/27/21 14:38	05/06/21 21:46	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**581**	mg/L	20.0	7.5	1		04/30/21 18:23		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**735**	mg/L	10.0	10.0	1		04/26/21 11:01		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.9**	mg/L	1.0	0.39	1		04/27/21 19:22	16887-00-6	B
Fluoride	**0.29**	mg/L	0.20	0.086	1		04/27/21 19:22	16984-48-8	
Sulfate	**78.7**	mg/L	10.0	4.2	10		04/27/21 20:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-TMW-2 **Lab ID: 60367255002** Collected: 04/19/21 11:55 Received: 04/21/21 03:49 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 Pace Analytical Services - Kansas City								
Boron	**98.3J**	ug/L	100	8.6	1	04/27/21 14:38	05/06/21 21:53	7440-42-8	
Calcium	**198000**	ug/L	200	75.4	1	04/27/21 14:38	05/06/21 21:53	7440-70-2	
Iron	**982**	ug/L	50.0	21.4	1	04/27/21 14:38	05/06/21 21:53	7439-89-6	
Magnesium	**46200**	ug/L	50.0	31.4	1	04/27/21 14:38	05/06/21 21:53	7439-95-4	
Manganese	**2890**	ug/L	5.0	0.74	1	04/27/21 14:38	05/06/21 21:53	7439-96-5	
Potassium	**6780**	ug/L	500	146	1	04/27/21 14:38	05/06/21 21:53	7440-09-7	
Sodium	**10600**	ug/L	500	254	1	04/27/21 14:38	05/06/21 21:53	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**567**	mg/L	20.0	7.5	1		04/30/21 18:49		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**750**	mg/L	10.0	10.0	1		04/26/21 11:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.39	1		04/27/21 02:02	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/27/21 02:02	16984-48-8	
Sulfate	**103**	mg/L	10.0	4.2	10		04/27/21 02:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-TMW-3 **Lab ID: 60367255003** Collected: 04/19/21 14:55 Received: 04/21/21 03:49 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 Pace Analytical Services - Kansas City								
Boron	**120**	ug/L	100	8.6	1	04/27/21 14:38	05/06/21 22:03	7440-42-8	
Calcium	**177000**	ug/L	200	75.4	1	04/27/21 14:38	05/06/21 22:03	7440-70-2	
Iron	**7240**	ug/L	50.0	21.4	1	04/27/21 14:38	05/06/21 22:03	7439-89-6	
Magnesium	**37000**	ug/L	50.0	31.4	1	04/27/21 14:38	05/06/21 22:03	7439-95-4	
Manganese	**979**	ug/L	5.0	0.74	1	04/27/21 14:38	05/06/21 22:03	7439-96-5	
Potassium	**6690**	ug/L	500	146	1	04/27/21 14:38	05/06/21 22:03	7440-09-7	
Sodium	**11000**	ug/L	500	254	1	04/27/21 14:38	05/06/21 22:03	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**602**	mg/L	20.0	7.5	1		04/30/21 18:55		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**829**	mg/L	10.0	10.0	1		04/26/21 11:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**5.5**	mg/L	1.0	0.39	1		04/27/21 02:31	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/27/21 02:31	16984-48-8	
Sulfate	**52.2**	mg/L	5.0	2.1	5		04/27/21 02:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-UWL-DUP-1 **Lab ID: 60367255004** Collected: 04/19/21 00:00 Received: 04/21/21 03:49 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 Pace Analytical Services - Kansas City								
Boron	**101**	ug/L	100	8.6	1	04/27/21 14:38	05/06/21 22:06	7440-42-8	
Calcium	**204000**	ug/L	200	75.4	1	04/27/21 14:38	05/06/21 22:06	7440-70-2	
Iron	**1080**	ug/L	50.0	21.4	1	04/27/21 14:38	05/06/21 22:06	7439-89-6	
Magnesium	**46900**	ug/L	50.0	31.4	1	04/27/21 14:38	05/06/21 22:06	7439-95-4	
Manganese	**2950**	ug/L	5.0	0.74	1	04/27/21 14:38	05/06/21 22:06	7439-96-5	
Potassium	**7020**	ug/L	500	146	1	04/27/21 14:38	05/06/21 22:06	7440-09-7	
Sodium	**10800**	ug/L	500	254	1	04/27/21 14:38	05/06/21 22:06	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**589**	mg/L	20.0	7.5	1		04/30/21 19:02		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**810**	mg/L	10.0	10.0	1		04/26/21 11:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.39	1		04/27/21 02:59	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/27/21 02:59	16984-48-8	
Sulfate	**103**	mg/L	10.0	4.2	10		04/27/21 03:14	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-UWL-FB-1 **Lab ID: 60367255005** Collected: 04/19/21 15:19 Received: 04/21/21 03:49 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 Pace Analytical Services - Kansas City								
Boron	**<8.6**	ug/L	100	8.6	1	04/27/21 14:38	05/06/21 22:08	7440-42-8	
Calcium	**<75.4**	ug/L	200	75.4	1	04/27/21 14:38	05/06/21 22:08	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	04/27/21 14:38	05/06/21 22:08	7439-89-6	
Magnesium	**<31.4**	ug/L	50.0	31.4	1	04/27/21 14:38	05/06/21 22:08	7439-95-4	
Manganese	**<0.74**	ug/L	5.0	0.74	1	04/27/21 14:38	05/06/21 22:08	7439-96-5	
Potassium	**<146**	ug/L	500	146	1	04/27/21 14:38	05/06/21 22:08	7440-09-7	
Sodium	**<254**	ug/L	500	254	1	04/27/21 14:38	05/06/21 22:08	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**<7.5**	mg/L	20.0	7.5	1		04/30/21 19:07		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**22.0**	mg/L	5.0	5.0	1		04/26/21 11:03		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**<0.39**	mg/L	1.0	0.39	1		04/27/21 03:57	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		04/27/21 03:57	16984-48-8	
Sulfate	**<0.42**	mg/L	1.0	0.42	1		04/27/21 03:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

Sample: L-MW-26 **Lab ID: 60366962013** Collected: 04/16/21 11:16 Received: 04/17/21 03:35 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 Pace Analytical Services - Kansas City								
Boron	**164**	ug/L	100	8.6	1	04/28/21 14:32	05/10/21 18:51	7440-42-8	
Calcium	**138000**	ug/L	200	75.4	1	04/28/21 14:32	05/10/21 18:51	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	04/28/21 14:32	05/10/21 18:51	7439-89-6	
Magnesium	**28000**	ug/L	50.0	31.4	1	04/28/21 14:32	05/10/21 18:51	7439-95-4	
Manganese	**1120**	ug/L	5.0	0.74	1	04/28/21 14:32	05/10/21 18:51	7439-96-5	
Potassium	**4440**	ug/L	500	146	1	04/28/21 14:32	05/10/21 18:51	7440-09-7	
Sodium	**7550**	ug/L	500	254	1	04/28/21 14:32	05/10/21 18:51	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Kansas City								
Alkalinity, Total as CaCO3	**440**	mg/L	20.0	7.5	1		04/27/21 20:01		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**512**	mg/L	10.0	10.0	1		04/23/21 15:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**7.7**	mg/L	1.0	0.39	1		04/27/21 16:54	16887-00-6	
Fluoride	**0.29**	mg/L	0.20	0.086	1		04/27/21 16:54	16984-48-8	
Sulfate	**24.1**	mg/L	2.0	0.84	2		04/27/21 17:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 717031
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

METHOD BLANK: 2884481 Matrix: Water
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	05/06/21 21:24	
Calcium	ug/L	<75.4	200	75.4	05/06/21 21:24	
Iron	ug/L	<21.4	50.0	21.4	05/06/21 21:24	
Magnesium	ug/L	<31.4	50.0	31.4	05/06/21 21:24	
Manganese	ug/L	<0.74	5.0	0.74	05/06/21 21:24	
Potassium	ug/L	<146	500	146	05/06/21 21:24	
Sodium	ug/L	<254	500	254	05/06/21 21:24	

LABORATORY CONTROL SAMPLE: 2884482

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1020	102	85-115	
Calcium	ug/L	10000	10200	102	85-115	
Iron	ug/L	10000	10200	102	85-115	
Magnesium	ug/L	10000	10400	104	85-115	
Manganese	ug/L	1000	1030	103	85-115	
Potassium	ug/L	10000	10300	103	85-115	
Sodium	ug/L	10000	10400	104	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884483 2884484

Parameter	Units	60367255001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	108	1000	1000	1150	1130	104	102	70-130	2	20	
Calcium	ug/L	176000	10000	10000	191000	186000	151	100	70-130	3	20	M1
Iron	ug/L	3680	10000	10000	14000	13800	103	101	70-130	2	20	
Magnesium	ug/L	45700	10000	10000	58100	56600	124	109	70-130	3	20	
Manganese	ug/L	8230	1000	1000	9590	9320	136	108	70-130	3	20	M1
Potassium	ug/L	5550	10000	10000	16300	15900	107	103	70-130	3	20	
Sodium	ug/L	11500	10000	10000	22200	21600	107	102	70-130	2	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 717296
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60366962013

METHOD BLANK: 2885311 Matrix: Water
Associated Lab Samples: 60366962013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	05/10/21 13:50	
Calcium	ug/L	<75.4	200	75.4	05/10/21 13:50	
Iron	ug/L	<21.4	50.0	21.4	05/10/21 13:50	
Magnesium	ug/L	<31.4	50.0	31.4	05/10/21 13:50	
Manganese	ug/L	<0.74	5.0	0.74	05/10/21 13:50	
Potassium	ug/L	<146	500	146	05/10/21 13:50	
Sodium	ug/L	<254	500	254	05/10/21 13:50	

LABORATORY CONTROL SAMPLE: 2885312

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1050	105	85-115	
Calcium	ug/L	10000	10500	105	85-115	
Iron	ug/L	10000	10700	107	85-115	
Magnesium	ug/L	10000	10900	109	85-115	
Manganese	ug/L	1000	1060	106	85-115	
Potassium	ug/L	10000	10700	107	85-115	
Sodium	ug/L	10000	10900	109	85-115	

MATRIX SPIKE SAMPLE: 2885313

Parameter	Units	60366962003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	12000	1000	12300	29	70-130	M1
Calcium	ug/L	98000	10000	105000	72	70-130	
Iron	ug/L	5400	10000	15400	100	70-130	
Magnesium	ug/L	24100	10000	32700	86	70-130	
Manganese	ug/L	247	1000	1230	98	70-130	
Potassium	ug/L	7410	10000	17800	104	70-130	
Sodium	ug/L	85200	10000	93800	87	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885314 2885315

Parameter	Units	60367051001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	5170	1000	1000	5770	6060	60	90	70-130	5	20	M1
Calcium	ug/L	192000	10000	10000	200000	198000	87	64	70-130	1	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2885314 2885315

Parameter	Units	60367051001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	9520	10000	10000	20300	19500	108	100	70-130	4	20	
Magnesium	ug/L	25400	10000	10000	33500	34900	82	96	70-130	4	20	
Manganese	ug/L	1720	1000	1000	2740	2700	102	99	70-130	1	20	
Potassium	ug/L	6480	10000	10000	16900	16900	104	105	70-130	0	20	
Sodium	ug/L	56000	10000	10000	66800	66600	108	106	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 717133
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60366962013

METHOD BLANK: 2884780 Matrix: Water
Associated Lab Samples: 60366962013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.5	20.0	7.5	04/27/21 18:12	

LABORATORY CONTROL SAMPLE: 2884781

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	518	104	90-110	

SAMPLE DUPLICATE: 2884782

Parameter	Units	60367468001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	1110	1050	5	10	

SAMPLE DUPLICATE: 2884783

Parameter	Units	60366962007 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	123	125	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 717897 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

METHOD BLANK: 2887339 Matrix: Water
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<7.5	20.0	7.5	04/30/21 16:27	

LABORATORY CONTROL SAMPLE: 2887340

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	500	505	101	90-110	

SAMPLE DUPLICATE: 2887341

Parameter	Units	60366962021 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	528	539	2	10	

SAMPLE DUPLICATE: 2887342

Parameter	Units	60367255001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	581	604	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 716543
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366962013

METHOD BLANK: 2882556 Matrix: Water
Associated Lab Samples: 60366962013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/23/21 15:58	

LABORATORY CONTROL SAMPLE: 2882557

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

SAMPLE DUPLICATE: 2882558

Parameter	Units	60366969001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	607	613	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 716657 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

METHOD BLANK: 2883304 Matrix: Water
Associated Lab Samples: 60367255001, 60367255002, 60367255003, 60367255004, 60367255005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	04/26/21 11:00	

LABORATORY CONTROL SAMPLE: 2883305

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1060	106	80-120	

SAMPLE DUPLICATE: 2883306

Parameter	Units	60366962021 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	569	565	1	10	

SAMPLE DUPLICATE: 2883307

Parameter	Units	60367255001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	735	709	4	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 716505
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60367255002, 60367255003, 60367255004, 60367255005

METHOD BLANK: 2882469 Matrix: Water
Associated Lab Samples: 60367255002, 60367255003, 60367255004, 60367255005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/26/21 10:15	
Fluoride	mg/L	<0.086	0.20	0.086	04/26/21 10:15	
Sulfate	mg/L	<0.42	1.0	0.42	04/26/21 10:15	

METHOD BLANK: 2886127 Matrix: Water
Associated Lab Samples: 60367255002, 60367255003, 60367255004, 60367255005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/27/21 07:33	
Fluoride	mg/L	<0.086	0.20	0.086	04/27/21 07:33	
Sulfate	mg/L	<0.42	1.0	0.42	04/27/21 07:33	

LABORATORY CONTROL SAMPLE: 2882470

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	93	90-110	
Fluoride	mg/L	2.5	2.3	93	90-110	
Sulfate	mg/L	5	4.6	92	90-110	

LABORATORY CONTROL SAMPLE: 2886128

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2882472 2882473

Parameter	Units	60366282001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	5	5	5.0	5.1	100	102	80-120	2	15	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.5	99	100	80-120	1	15	
Sulfate	mg/L	ND	5	5	5.0	5.2	100	103	80-120	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

MATRIX SPIKE SAMPLE: 2882474

Parameter	Units	60367226001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	692	500	1200	102	80-120	
Fluoride	mg/L	ND	250	255	102	80-120	
Sulfate	mg/L	546	500	1030	98	80-120	

SAMPLE DUPLICATE: 2882471

Parameter	Units	60366282001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	ND	<0.39		15	
Fluoride	mg/L	ND	<0.086		15	
Sulfate	mg/L	ND	<0.42		15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 716874
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60367255001

METHOD BLANK: 2883996 Matrix: Water
Associated Lab Samples: 60367255001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.49J	1.0	0.39	04/27/21 17:15	
Fluoride	mg/L	<0.086	0.20	0.086	04/27/21 17:15	
Sulfate	mg/L	<0.42	1.0	0.42	04/27/21 17:15	

METHOD BLANK: 2886138 Matrix: Water
Associated Lab Samples: 60367255001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/28/21 09:17	
Fluoride	mg/L	<0.086	0.20	0.086	04/28/21 09:17	
Sulfate	mg/L	<0.42	1.0	0.42	04/28/21 09:17	

METHOD BLANK: 2887077 Matrix: Water
Associated Lab Samples: 60367255001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/29/21 08:44	
Fluoride	mg/L	<0.086	0.20	0.086	04/29/21 08:44	
Sulfate	mg/L	<0.42	1.0	0.42	04/29/21 08:44	

LABORATORY CONTROL SAMPLE: 2883997

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.5	101	90-110	
Sulfate	mg/L	5	4.9	99	90-110	

LABORATORY CONTROL SAMPLE: 2886139

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	99	90-110	
Sulfate	mg/L	5	4.8	97	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

LABORATORY CONTROL SAMPLE: 2887078

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	90-110	
Fluoride	mg/L	2.5	2.4	96	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE SAMPLE: 2883998

Parameter	Units	60367157006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	137	50	188	103	80-120	
Fluoride	mg/L	ND	25	25.5	98	80-120	
Sulfate	mg/L	89.4	50	138	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2883999 2884000

Parameter	Units	60367255001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3.9	5	5	8.7	8.5	96	93	80-120	2	15	
Fluoride	mg/L	0.29	2.5	2.5	2.9	2.8	104	100	80-120	4	15	
Sulfate	mg/L	78.7	50	50	130	132	103	107	80-120	1	15	

SAMPLE DUPLICATE: 2884001

Parameter	Units	60367255001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	3.9	3.9	0	15	
Fluoride	mg/L	0.29	0.28	1	15	
Sulfate	mg/L	78.7	81.5	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

QC Batch: 716877
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60366962013

METHOD BLANK: 2884030 Matrix: Water
Associated Lab Samples: 60366962013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/27/21 08:08	
Fluoride	mg/L	<0.086	0.20	0.086	04/27/21 08:08	
Sulfate	mg/L	<0.42	1.0	0.42	04/27/21 08:08	

METHOD BLANK: 2886241 Matrix: Water
Associated Lab Samples: 60366962013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	04/28/21 09:21	
Fluoride	mg/L	<0.086	0.20	0.086	04/28/21 09:21	
Sulfate	mg/L	<0.42	1.0	0.42	04/28/21 09:21	

LABORATORY CONTROL SAMPLE: 2884031

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.3	106	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

LABORATORY CONTROL SAMPLE: 2886242

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Sulfate	mg/L	5	5.0	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2884033 2884034

Parameter	Units	60366138006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	120	100	100	227	231	107	111	80-120	2	15	
Fluoride	mg/L	<0.086	2.5	2.5	2.2	2.4	86	97	80-120	11	15	
Sulfate	mg/L	258	100	100	367	368	109	110	80-120	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

MATRIX SPIKE SAMPLE: 2884035

Parameter	Units	60366962014 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1.9	5	7.6	113	80-120	
Fluoride	mg/L	0.32	2.5	2.9	104	80-120	
Sulfate	mg/L	53.7	50	94.7	82	80-120	

SAMPLE DUPLICATE: 2884032

Parameter	Units	60366138006 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	120	119	0	15	
Fluoride	mg/L	<0.086	<0.086		15	
Sulfate	mg/L	258	258	0	15	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALIFIERS

Project: AMEREN LEC LCL1
Pace Project No.: 60367255

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.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
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 LEC LCL1
Pace Project No.: 60367255

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60366962013	**L-MW-26**	EPA 200.7	717296	EPA 200.7	717436
60367255001	**L-TMW-1**	EPA 200.7	717031	EPA 200.7	717130
60367255002	**L-TMW-2**	EPA 200.7	717031	EPA 200.7	717130
60367255003	**L-TMW-3**	EPA 200.7	717031	EPA 200.7	717130
60367255004	**L-UWL-DUP-1**	EPA 200.7	717031	EPA 200.7	717130
60367255005	**L-UWL-FB-1**	EPA 200.7	717031	EPA 200.7	717130
60366962013	**L-MW-26**	SM 2320B	717133		
60367255001	**L-TMW-1**	SM 2320B	717897		
60367255002	**L-TMW-2**	SM 2320B	717897		
60367255003	**L-TMW-3**	SM 2320B	717897		
60367255004	**L-UWL-DUP-1**	SM 2320B	717897		
60367255005	**L-UWL-FB-1**	SM 2320B	717897		
60366962013	**L-MW-26**	SM 2540C	716543		
60367255001	**L-TMW-1**	SM 2540C	716657		
60367255002	**L-TMW-2**	SM 2540C	716657		
60367255003	**L-TMW-3**	SM 2540C	716657		
60367255004	**L-UWL-DUP-1**	SM 2540C	716657		
60367255005	**L-UWL-FB-1**	SM 2540C	716657		
60366962013	**L-MW-26**	EPA 300.0	716877		
60367255001	**L-TMW-1**	EPA 300.0	716874		
60367255002	**L-TMW-2**	EPA 300.0	716505		
60367255003	**L-TMW-3**	EPA 300.0	716505		
60367255004	**L-UWL-DUP-1**	EPA 300.0	716505		
60367255005	**L-UWL-FB-1**	EPA 300.0	716505		

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Sample Condition Upon Receipt

WO# : 60367255

60367255

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 ☑ Epic

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

Cooler Temperature (°C): As-read 0.2,0.8 Corr. Factor 0.0 Corrected 0.2,0.8

Date and initials of person examining contents: 4.21 ML

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) LOT# 603173	☑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: _____

REVIEWED

Project Manager Review: *By jchurch at 4:20 pm, 4/21/21* 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.

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman
Purchase Order No.:	COC #4
Project Name:	Ameren Labadie Energy Center LCL1
Project Number:	153140602.0001C

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 3

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

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	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: N	N	N	N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS		60367253
1	L-MW-26	WT	G																				
2	L-TMW-1	WT	G			4-19-21	1305		2	1		1						/	/	/	/		
3	L-TMW-2	WT	G			"	1155		"	"		"						/	/	/	/		
4	L-TMW-3	WT	G			"	1455		"	"		"						/	/	/	/		
5	L-BMW-1S	WT	G																				
6	L-BMW-2S	WT	G																				
7	L-UWL-DUP-1	WT	G			4-15-21	—		2	1		1						/	/	/	/		
8	L-UWL-FB-1	WT	G			"	1519		"	"		"						/	/	/	/		
9	L-UWL-MS-1	WT	G			"	1305		"	"		"						/	/	/	/		
10	L-UWL-MSD-1	WT	G			"	1305		"	"		"						/	/	/	/		
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)
App III and Cat/An Metals - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Brendan Talbert/Golder	4/20/21	~~1730~~ 1730	MLarge/PACE	4-21	0349	0.2	Y	Y	Y
Time for L-UWL-FB-1 is 1519							0.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brendan Talbert

SIGNATURE of SAMPLER: Brendan Talbert DATE Signed (MM/DD/YY):

*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.

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60366962

60366962

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 ☑ 2PLC

Thermometer Used: T-298 1.4 17.2 Type of Ice: ~~Wet~~ Blue None 1.4 17.2 °C

Cooler Temperature (°C): As-read 1.1 18.5 1.7 Corr. Factor 0.0 Corrected 1.1 18.5 1.7

Temperature should be above freezing to 6°C

Date and initials of person examining contents: 4-17-21 KD

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	Received containers not on COC.
Sufficient volume:	☑Yes ☐No ☐N/A	1BP1U, 2BP1Ns, 1BP3U, 1BP3N, 1BP4Z
Correct containers used:	☑Yes ☐No ☐N/A	for the following:
Pace containers used:	☑Yes ☐No ☐N/A	L-UMW-7D 4-15-21 10:18
Containers intact:	☑Yes ☐No ☐N/A	L-UMW-MS-1 4-15-21 10:18
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	L-UMW-MSD-1 4-15-21 10:18
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) LOT# 603173, 603222	☑Yes ☑No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added. L-LMW-1S BP4Z pH 9.5
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 _____

REVIEWED
By jchurch at 9:28 am, 4/19/21

Project Manager Revie _____ Date: _____

Pace Analytical
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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman
Purchase Order No.:	COC #4
Project Name:	Ameren Labadie Energy Center LCL1
Project Number:	153140602.0001C

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 3

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

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	Chloride/Fluoride/Sulfate N	App III and Cat/An Metals N	Alkalinity N	TDS N	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	L-MW-26	WT	G			4-16-21	1116		2	1		1							/	/	/	/		
2	L-TMW-1	WT	G																					
3	L-TMW-2	WT	G																					
4	L-TMW-3	WT	G																					
5	L-BMW-1S	WT	G																					
6	L-BMW-2S	WT	G																					
7	L-UWL-DUP-1	WT	G																					
8	L-UWL-FB-1	WT	G																					
9	L-UWL-MS-1	WT	G																					
10	L-UWL-MSD-1	WT	G																					
11		WT	G																					
12		WT	G																					

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
App III and Cat/An Metals - EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Brenden Talbot / Golder	4-16-21	1720	Angela McMahon	4/16	1730	
	Angela McMahon	4/16	1730				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brenden Talbot

SIGNATURE of SAMPLER: Brenden Talbot

DATE Signed (MM/DD/YY): 04/16/21

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.

MEMORANDUM

DATE July 6, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – DETECTION MONITORING - DATA PACKAGE 60367255

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 blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- 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 Name: Ameren - LEC - LCL1
Reviewer: A. Muehlfarth

Project Manager: J. Ingram
Project Number: 13140603
Validation Date: 7/6/2021

Laboratory: Pace Analytical
SDG #: 60367255
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2320B (Alkalinity); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ☐ Water ☐ Waste ☐
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-UWL-FB-1, L-MW-26

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?	☒	☐	☐	4/16/2021 - 4/19/2021
b) Sampling team indicated?	☒	☐	☐	AMM
c) Sample location noted?	☒	☐	☐	
d) Sample depth indicated (Soils)?	☐	☐	☒	
e) Sample type indicated (grab/composite)?	☒	☐	☐	Grab
f) Field QC noted?	☒	☐	☐	See Notes
g) Field parameters collected (note types)?	☒	☐	☐	pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	☒	☐	☐	
i) Notations of unacceptable field conditions/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?	☒	☐	☐	See Notes
g) Were any matrix problems noted?	☒	☐	☐	See Notes

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?	x			See Notes
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			L-UWL-DUP-1 @ TMW-2
b) Were field dup. precision criteria met (note RPD)?	x			
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?	x			

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

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

Comments/Notes:

Dilutions: Sulfate was diluted in several samples, no qualification necessary.

Method Blanks:

2883996: Chloride (0.49J), associated with sample -001. 10x blank > result > RL, sample result qualified as estimated.

Field Blanks:

L-UWL-FB-1 @ L-TMW-3: TDS (22.0). Associated sample result >RL and 10x blank, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

Duplicates:

The laboratory analyzed sample duplicates for Alkalinity, TDS, and Anions.

MS/MSD:

2884483/2884484: MS % recovery high for Calcium, Manganese. Associated with sample -001. Only one QC indicator out of control limits, no qualification necessary.

2885313: MS % recovery low for Boron. MS performed on unrelated sample, no qualification necessary.

2885314/2885315: MS % recovery low for Boron; MSD % recovery low for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-TMW-1	Chloride	3.9	J	Detected in MB, 10x blank > result > RL

Signature: Ann Muhlfarth Date: 7/6/2021

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

June 21, 2021

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

RE: Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory on June 09, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Kansas City

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
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

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

CERTIFICATIONS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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

SAMPLE SUMMARY

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60371616001	**L-TMW-1**	Water	06/07/21 09:52	06/09/21 04:00
60371616002	**L-TMW-2**	Water	06/07/21 11:28	06/09/21 04:00
60371616003	**L-TMW-3**	Water	06/07/21 12:04	06/09/21 04:00
60371616004	**L-MW-26**	Water	06/07/21 12:46	06/09/21 04:00
60371616005	**L-LCL1-FB-1**	Water	06/07/21 10:40	06/09/21 04:00
60371616006	**L-LCL1-DUP-1**	Water	06/07/21 08:00	06/09/21 04:00

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

SAMPLE ANALYTE COUNT

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60371616001	**L-TMW-1**	EPA 200.7	JLH	2	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K
60371616002	**L-TMW-2**	EPA 200.7	JLH	2	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K
60371616003	**L-TMW-3**	SM 2540C	ALH	1	PASI-K
60371616004	**L-MW-26**	EPA 200.7	JLH	2	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K
60371616005	**L-LCL1-FB-1**	EPA 200.7	JLH	2	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K
60371616006	**L-LCL1-DUP-1**	EPA 200.7	JLH	2	PASI-K
		SM 2540C	ALH	1	PASI-K
		EPA 300.0	CRN2	2	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-TMW-1 **Lab ID: 60371616001** Collected: 06/07/21 09:52 Received: 06/09/21 04:00 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 Pace Analytical Services - Kansas City								
Boron	**98.8J**	ug/L	100	8.6	1	06/15/21 09:14	06/15/21 20:09	7440-42-8	
Calcium	**155000**	ug/L	200	75.4	1	06/15/21 09:14	06/15/21 20:09	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**630**	mg/L	10.0	10.0	1		06/11/21 10:51		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.8**	mg/L	1.0	0.39	1		06/17/21 11:36	16887-00-6	B
Fluoride	**0.23**	mg/L	0.20	0.086	1		06/17/21 11:36	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-TMW-2 **Lab ID: 60371616002** Collected: 06/07/21 11:28 Received: 06/09/21 04:00 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 Pace Analytical Services - Kansas City								
Boron	**94.4J**	ug/L	100	8.6	1	06/15/21 09:14	06/15/21 20:12	7440-42-8	
Calcium	**185000**	ug/L	200	75.4	1	06/15/21 09:14	06/15/21 20:12	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**725**	mg/L	10.0	10.0	1		06/11/21 10:51		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.39	1		06/17/21 11:49	16887-00-6	B
Fluoride	**<0.086**	mg/L	0.20	0.086	1		06/17/21 11:49	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-TMW-3 **Lab ID: 60371616003** Collected: 06/07/21 12:04 Received: 06/09/21 04:00 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**596**	mg/L	10.0	10.0	1		06/11/21 10:51		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-MW-26 **Lab ID: 60371616004** Collected: 06/07/21 12:46 Received: 06/09/21 04:00 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 Pace Analytical Services - Kansas City								
Boron	**82.5J**	ug/L	100	8.6	1	06/15/21 09:14	06/15/21 20:15	7440-42-8	
Calcium	**123000**	ug/L	200	75.4	1	06/15/21 09:14	06/15/21 20:15	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**462**	mg/L	10.0	10.0	1		06/11/21 10:51		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.39	1		06/18/21 21:32	16887-00-6	B
Fluoride	**0.15J**	mg/L	0.20	0.086	1		06/18/21 21:32	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-LCL1-FB-1 **Lab ID: 60371616005** Collected: 06/07/21 10:40 Received: 06/09/21 04:00 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 Pace Analytical Services - Kansas City								
Boron	**<8.6**	ug/L	100	8.6	1	06/15/21 09:14	06/15/21 20:22	7440-42-8	
Calcium	**<75.4**	ug/L	200	75.4	1	06/15/21 09:14	06/15/21 20:22	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**17.0**	mg/L	5.0	5.0	1		06/11/21 10:52		B
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**0.61J**	mg/L	1.0	0.39	1		06/17/21 12:01	16887-00-6	B
Fluoride	**<0.086**	mg/L	0.20	0.086	1		06/17/21 12:01	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

Sample: L-LCL1-DUP-1 **Lab ID: 60371616006** Collected: 06/07/21 08:00 Received: 06/09/21 04:00 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 Pace Analytical Services - Kansas City								
Boron	**96.5J**	ug/L	100	8.6	1	06/15/21 09:14	06/15/21 20:24	7440-42-8	
Calcium	**188000**	ug/L	200	75.4	1	06/15/21 09:14	06/15/21 20:24	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**739**	mg/L	10.0	10.0	1		06/11/21 10:52		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.3**	mg/L	1.0	0.39	1		06/17/21 12:14	16887-00-6	B
Fluoride	**0.25**	mg/L	0.20	0.086	1		06/17/21 12:14	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

QC Batch: 726287
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371616001, 60371616002, 60371616004, 60371616005, 60371616006

METHOD BLANK: 2918194 Matrix: Water
Associated Lab Samples: 60371616001, 60371616002, 60371616004, 60371616005, 60371616006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	06/15/21 19:27	
Calcium	ug/L	<75.4	200	75.4	06/15/21 19:27	

LABORATORY CONTROL SAMPLE: 2918195

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	873	87	85-115	
Calcium	ug/L	10000	9600	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2918196 2918197

Parameter	Units	60371615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	6900	1000	1000	8020	7820	112	92	70-130	3	20	
Calcium	ug/L	194000	10000	10000	208000	205000	138	105	70-130	2	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2918198 2918199

Parameter	Units	60371616004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	82.5J	1000	1000	981	981	90	90	70-130	0	20	
Calcium	ug/L	123000	10000	10000	132000	136000	90	128	70-130	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

QC Batch: 725740 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371616001, 60371616002, 60371616003, 60371616004, 60371616005, 60371616006

METHOD BLANK: 2916343 Matrix: Water
Associated Lab Samples: 60371616001, 60371616002, 60371616003, 60371616004, 60371616005, 60371616006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	7.5	5.0	5.0	06/11/21 10:50	

LABORATORY CONTROL SAMPLE: 2916344

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	976	98	80-120	

SAMPLE DUPLICATE: 2916345

Parameter	Units	60371616004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	462	478	3	10	

SAMPLE DUPLICATE: 2916346

Parameter	Units	60371615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1110	1100	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

QC Batch: 726792 | Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 | Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60371616001, 60371616002, 60371616005, 60371616006

METHOD BLANK: 2920019 Matrix: Water
Associated Lab Samples: 60371616001, 60371616002, 60371616005, 60371616006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	06/17/21 11:11	
Fluoride	mg/L	<0.086	0.20	0.086	06/17/21 11:11	

METHOD BLANK: 2923074 Matrix: Water
Associated Lab Samples: 60371616001, 60371616002, 60371616005, 60371616006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	06/18/21 09:15	
Fluoride	mg/L	<0.086	0.20	0.086	06/18/21 09:15	

METHOD BLANK: 2923399 Matrix: Water
Associated Lab Samples: 60371616001, 60371616002, 60371616005, 60371616006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.67J	1.0	0.39	06/21/21 08:38	
Fluoride	mg/L	<0.086	0.20	0.086	06/21/21 08:38	

LABORATORY CONTROL SAMPLE: 2920020

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	

LABORATORY CONTROL SAMPLE: 2923075

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.2	104	90-110	
Fluoride	mg/L	2.5	2.7	109	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

LABORATORY CONTROL SAMPLE: 2923400

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	90-110	
Fluoride	mg/L	2.5	2.3	91	90-110	

MATRIX SPIKE SAMPLE: 2920021

Parameter	Units	60371684013 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	650	1000	1540	89	80-120	
Fluoride	mg/L	ND	500	486	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2920022 2920023

Parameter	Units	60371937001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	1.8	5	5	6.4	6.4	93	92	80-120	1	15	
Fluoride	mg/L	4.1	2.5	2.5	6.8	6.8	108	110	80-120	1	15	

SAMPLE DUPLICATE: 2920024

Parameter	Units	60371937001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	1.8	1.6	9	15	
Fluoride	mg/L	4.1	4.0	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

QC Batch: 727236
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60371616004

METHOD BLANK: 2921782 Matrix: Water
Associated Lab Samples: 60371616004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.67J	1.0	0.39	06/18/21 15:42	
Fluoride	mg/L	<0.086	0.20	0.086	06/18/21 15:42	

METHOD BLANK: 2923401 Matrix: Water
Associated Lab Samples: 60371616004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.59J	1.0	0.39	06/21/21 08:40	
Fluoride	mg/L	<0.086	0.20	0.086	06/21/21 08:40	

LABORATORY CONTROL SAMPLE: 2921783

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

LABORATORY CONTROL SAMPLE: 2923402

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	91	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2921784 2921785

Parameter	Units	60371614001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.3	10	10	31.3	31.5	100	102	80-120	1	15	
Fluoride	mg/L	<0.086	2.5	2.5	2.7	2.8	104	108	80-120	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2921787 2921788

Parameter	Units	60371615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16.2	5	5	21.6	21.8	108	112	80-120	1	15	E
Fluoride	mg/L	<0.086	2.5	2.5	2.9	3.0	115	118	80-120	3	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2921790 2921791

Parameter	Units	60371616004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.3	5	5	11.3	11.3	99	100	80-120	0	15	
Fluoride	mg/L	0.15J	2.5	2.5	2.7	2.8	102	104	80-120	2	15	

SAMPLE DUPLICATE: 2921786

Parameter	Units	60371614001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	21.3	21.3	0	15	
Fluoride	mg/L	<0.086	0.097J		15	

SAMPLE DUPLICATE: 2921789

Parameter	Units	60371615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	16.2	16.2	0	15	
Fluoride	mg/L	<0.086	0.29		15	

SAMPLE DUPLICATE: 2921792

Parameter	Units	60371616004 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	6.3	6.3	0	15	
Fluoride	mg/L	0.15J	0.14J		15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN-Verification - LCL1
Pace Project No.: 60371616

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.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
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-Verification - LCL1
Pace Project No.: 60371616

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60371616001	**L-TMW-1**	EPA 200.7	726287	EPA 200.7	726362
60371616002	**L-TMW-2**	EPA 200.7	726287	EPA 200.7	726362
60371616004	**L-MW-26**	EPA 200.7	726287	EPA 200.7	726362
60371616005	**L-LCL1-FB-1**	EPA 200.7	726287	EPA 200.7	726362
60371616006	**L-LCL1-DUP-1**	EPA 200.7	726287	EPA 200.7	726362
60371616001	**L-TMW-1**	SM 2540C	725740		
60371616002	**L-TMW-2**	SM 2540C	725740		
60371616003	**L-TMW-3**	SM 2540C	725740		
60371616004	**L-MW-26**	SM 2540C	725740		
60371616005	**L-LCL1-FB-1**	SM 2540C	725740		
60371616006	**L-LCL1-DUP-1**	SM 2540C	725740		
60371616001	**L-TMW-1**	EPA 300.0	726792		
60371616002	**L-TMW-2**	EPA 300.0	726792		
60371616004	**L-MW-26**	EPA 300.0	727236		
60371616005	**L-LCL1-FB-1**	EPA 300.0	726792		
60371616006	**L-LCL1-DUP-1**	EPA 300.0	726792		

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Sample Condition Upon Receipt

WO#: 60371616

60371616

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 ☒ Zplc

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

Cooler Temperature (°C): **As-read** 1.0 / 1.3 / 2.0 **Corr. Factor** 0.0 ↓ **Corrected** 1.0 / 1.3 / 2.0

Date and initials of person examining contents: 6/9/21 SZ

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) LOT# L603173	X ☐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: _____

REVIEWED
By jchurch at 9:43 pm, 6/9/21

Project Manager Review: _____ Date: _____

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

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.

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Dr., Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Eric Schnieder, Ryan Feldman, Brendan Talbert
Purchase Order No.:	COC #1
Project Name:	Ameren - Verification Sampling -- LCL1
Project Number:	153140603, 0001C

Section C Invoice Information:

Attention:	
Company Name:	Golder Associates Inc
Address:	
Pace Quote Reference:	
Pace Project Manager:	Jamie Church
Pace Profile #:	9285, line 1

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	Chloride	Fluoride	Sulfate	TDS	Calcium	Boron					Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N	N	N	N	N	N		60037616
1	L-TMW-1	WT	G			6-7-21	0952		2	1		1							/	/		/	/	/		1-BP1U	1-BP3N		
2	L-TMW-2	WT	G				1128		2	1		1							/	/		/	/	/		1-BP2U	1-BP3N		
3	L-TMW-3	WT	G				1204		1	1		1										/				1-BP2U			
4	L-MW-26	WT	G				1246		2	1		1							/	/		/	/	/		1-BP2U	1-BP3N		
5	L-LCL1-FB-1	WT	G				1040		2	1		1							/	/		/	/	/		1-BP1U	1-BP3N		
6	L-LCL1-DUP-1	WT	G				—		2	1		1							/	/		/	/	/		1-BP2U	1-BP3N		
7	L-LCL1-MS-1	WT	G				1246		2	1		1							/	/		/	/	/		↓		↓	
8	L-LCL1-MSD-1	WT	G			↓	1246		2	1		1							/	/		/	/	/		↓			
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)
	Brendan Talbert / Golder	6-8-21	1750	[signature] / Pace	6/8/21	0700	1.0	Y	Y	Y
							1.3	Y	Y	Y
							2.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Brendan Talbert

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 06/08/21

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

MEMORANDUM

DATE August 31, 2021 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – VERIFICATION SAMPLING - DATA PACKAGE 60371616

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 blank (i.e. method, field), and the blank comparison criterion was not met, associated sample results were qualified as estimates (J) or non-detects (U).
- 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 duplicate criterion was not met, the associated sample result was qualified as an estimate (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 - LEC - LCL1
Project Number: 153140603
Reviewer: A. Muehlfarth
Validation Date: 8/31/2021

Laboratory: Pace Analytical - Kansas City
SDG #: 60371616
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, L-MW-26, L-LCL1-FB-1, L-LCL1-DUP-1

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

Field Information	YES	NO	NA	COMMENTS
a) Sampling dates noted?	x			6/7/2021
b) Sampling team indicated?	x			SSS/BTT
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Sp.Conductivity, ORP, Temp, DO, Turbidity
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?	x			See Notes
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			L-LCL1-DUP-1 @ L-TMW-2
b) Were field dup. precision criteria met (note RPD)?		x		See Notes
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?	x			Max RPD: 9% [<15%]

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

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

Comments/Notes:

Method Blank:

2916343: TDS (7.5), associated with samples -001 through -006. Sample results >RL and 10x the blank were not qualified. Sample results <10x the blank were qualified as estimates.

2923399: Chloride (0.67J), associated with samples -001, -002, -005, and -006. Sample results <RL were qualified as non-detect, sample results >RL but <10x blank were qualified as estimates.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

2921782/2923401: Chloride (0.67J/0.59J), associated with sample -004. Sample result >RL but <10x the highest blank detection, qualified as estimate.

Field Blanks:

L-LCL1-FB-1 @ L-TMW-1: TDS (17.0), Chloride (0.61J). Sample results >RL and 10x the blank were not qualified, Sample results <10x the blank were qualified as estimates.

Duplicates:

L-LCL1-DUP-1 @ L-TMW-2: Fluoride non-detect in the sample, detected in the DUP.

MS/MSD:

2918196/2918197: MS % recovery high for Calcium. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-LCL1-FB-1	Chloride	1.0	U	Detected in MB, sample result < RL
"	TDS	17.0	J	Detected in MB, 10x blank > result > RL
L-TMW-2	Chloride	6.3	J	"
L-LCL1-DUP-1	"	6.3	J	"
L-MW-26	"	6.3	J	"
L-TMW-1	"	3.8	J	Detected in MB and FB, 10x blank > result > RL
L-TMW-2	Fluoride	0.086	UJ	Detected in the DUP, ND in sample
L-LCL1-DUP-1	"	0.25	J	"

Signature: Ann Muehlfarth Date: 8/31/2021

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

December 28, 2021

Jeffrey Ingram
Golder Associates
701 Emerson Road, Suite 250
Saint Louis, MO 63141

RE: Project: AMEREN LCL1
Pace Project No.: 60385393

Dear Jeffrey Ingram:

Enclosed are the analytical results for sample(s) received by the laboratory between November 03, 2021 and November 06, 2021. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis
- Pace Analytical Services - Kansas City
- Pace Analytical Services - Greensburg

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
Mark Haddock, Golder Associates
Eric Schneider, Golder Associates
Brendan Talbert, Golder Associates

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

CERTIFICATIONS

Project: AMEREN LCL1
Pace Project No.: 60385393

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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

Pace Analytical Services Indianapolis
7726 Moller Road, Indianapolis, IN 46268
Illinois Accreditation #: 200074
Indiana Drinking Water Laboratory #: C-49-06
Kansas/TNI Certification #: E-10177
Kentucky UST Agency Interest #: 80226
Kentucky WW Laboratory ID #: 98019
Michigan Drinking Water Laboratory #9050
Ohio VAP Certified Laboratory #: CL0065
Oklahoma Laboratory #: 9204
Texas Certification #: T104704355
Wisconsin Laboratory #: 999788130
USDA Soil Permit #: P330-19-00257

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 2000302021-3
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: AMEREN LCL1
Pace Project No.: 60385393

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60385393001	**L-TMW-1**	Water	11/02/21 09:30	11/03/21 03:48
60385393002	**L-TMW-2**	Water	11/02/21 10:50	11/03/21 03:48
60385393003	**L-TMW-3**	Water	11/02/21 12:20	11/03/21 03:48
60385393006	**L-UWL-DUP-1**	Water	11/02/21 00:00	11/03/21 03:48
60385393007	**L-UWL-FB-1**	Water	11/02/21 12:45	11/03/21 03:48
60385386002	**L-BMW-1S**	Water	11/01/21 12:10	11/03/21 03:48
60385386003	**L-BMW-2S**	Water	11/01/21 13:40	11/03/21 03:48
60385386016	**L-MW-26**	Water	11/04/21 12:55	11/06/21 05:30

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

Project: AMEREN LCL1
Pace Project No.: 60385393

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60385393001	**L-TMW-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385393002	**L-TMW-2**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385393003	**L-TMW-3**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385393006	**L-UWL-DUP-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385393007	**L-UWL-FB-1**	EPA 200.7	JLH	7	PASI-K
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	ALH	3	PASI-K
60385386002	**L-BMW-1S**	EPA 200.7	MA1	7	PASI-K
		EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	JC2	1	PASI-PA
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MAW	3	PASI-K
60385386003	**L-BMW-2S**	EPA 200.7	MA1	7	PASI-K
		EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	JC2	1	PASI-PA
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K
		EPA 300.0	MAW	3	PASI-K
60385386016	**L-MW-26**	EPA 200.7	MA1	7	PASI-K
		EPA 903.1	SLC	1	PASI-PA
		EPA 904.0	JC2	1	PASI-PA
		SM 2320B	SWJ	1	PASI-I
		SM 2540C	BLA	1	PASI-K

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

SAMPLE ANALYTE COUNT

Project: AMEREN LCL1
Pace Project No.: 60385393

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 300.0	ALH	3	PASI-K

PASI-I = Pace Analytical Services - Indianapolis
PASI-K = Pace Analytical Services - Kansas City
PASI-PA = Pace Analytical Services - Greensburg

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-TMW-1 **Lab ID: 60385393001** Collected: 11/02/21 09:30 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**113**	ug/L	100	8.6	1	11/09/21 10:13	11/10/21 13:19	7440-42-8	
Calcium	**161000**	ug/L	200	75.4	1	11/09/21 10:13	11/10/21 13:19	7440-70-2	
Iron	**405**	ug/L	50.0	21.4	1	11/09/21 10:13	11/10/21 13:19	7439-89-6	
Magnesium	**44700**	ug/L	50.0	31.4	1	11/09/21 10:13	11/10/21 13:19	7439-95-4	
Manganese	**3740**	ug/L	5.0	0.74	1	11/09/21 10:13	11/10/21 13:19	7439-96-5	
Potassium	**5760**	ug/L	500	146	1	11/09/21 10:13	11/10/21 13:19	7440-09-7	
Sodium	**11700**	ug/L	500	254	1	11/09/21 10:13	11/10/21 13:19	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**504**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**617**	mg/L	10.0	10.0	1		11/09/21 09:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**2.6**	mg/L	1.0	0.39	1		11/09/21 10:25	16887-00-6	B
Fluoride	**0.27**	mg/L	0.20	0.086	1		11/09/21 10:25	16984-48-8	
Sulfate	**61.4**	mg/L	10.0	4.2	10		11/09/21 11:04	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-TMW-2 **Lab ID: 60385393002** Collected: 11/02/21 10:50 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**119**	ug/L	100	8.6	1	11/09/21 10:13	11/10/21 13:22	7440-42-8	
Calcium	**240000**	ug/L	200	75.4	1	11/09/21 10:13	11/10/21 13:22	7440-70-2	
Iron	**844**	ug/L	50.0	21.4	1	11/09/21 10:13	11/10/21 13:22	7439-89-6	
Magnesium	**65700**	ug/L	50.0	31.4	1	11/09/21 10:13	11/10/21 13:22	7439-95-4	
Manganese	**2380**	ug/L	5.0	0.74	1	11/09/21 10:13	11/10/21 13:22	7439-96-5	
Potassium	**7720**	ug/L	500	146	1	11/09/21 10:13	11/10/21 13:22	7440-09-7	
Sodium	**25900**	ug/L	500	254	1	11/09/21 10:13	11/10/21 13:22	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**593**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**960**	mg/L	13.3	13.3	1		11/09/21 09:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**19.7**	mg/L	1.0	0.39	1		11/09/21 11:44	16887-00-6	
Fluoride	**0.25**	mg/L	0.20	0.086	1		11/09/21 11:44	16984-48-8	
Sulfate	**259**	mg/L	20.0	8.4	20		11/10/21 18:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-TMW-3 **Lab ID: 60385393003** Collected: 11/02/21 12:20 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**116**	ug/L	100	8.6	1	11/09/21 10:13	11/10/21 13:24	7440-42-8	
Calcium	**161000**	ug/L	200	75.4	1	11/09/21 10:13	11/10/21 13:24	7440-70-2	
Iron	**6960**	ug/L	50.0	21.4	1	11/09/21 10:13	11/10/21 13:24	7439-89-6	
Magnesium	**36900**	ug/L	50.0	31.4	1	11/09/21 10:13	11/10/21 13:24	7439-95-4	
Manganese	**817**	ug/L	5.0	0.74	1	11/09/21 10:13	11/10/21 13:24	7439-96-5	
Potassium	**6360**	ug/L	500	146	1	11/09/21 10:13	11/10/21 13:24	7440-09-7	
Sodium	**8100**	ug/L	500	254	1	11/09/21 10:13	11/10/21 13:24	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**502**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**595**	mg/L	10.0	10.0	1		11/09/21 09:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**3.8**	mg/L	1.0	0.39	1		11/09/21 12:38	16887-00-6	B
Fluoride	**0.20**	mg/L	0.20	0.086	1		11/09/21 12:38	16984-48-8	
Sulfate	**40.3**	mg/L	10.0	4.2	10		11/09/21 12:51	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-UWL-DUP-1 **Lab ID: 60385393006** Collected: 11/02/21 00:00 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**112**	ug/L	100	8.6	1	11/09/21 10:13	11/10/21 13:27	7440-42-8	
Calcium	**243000**	ug/L	200	75.4	1	11/09/21 10:13	11/10/21 13:27	7440-70-2	
Iron	**826**	ug/L	50.0	21.4	1	11/09/21 10:13	11/10/21 13:27	7439-89-6	
Magnesium	**65500**	ug/L	50.0	31.4	1	11/09/21 10:13	11/10/21 13:27	7439-95-4	
Manganese	**2400**	ug/L	5.0	0.74	1	11/09/21 10:13	11/10/21 13:27	7439-96-5	
Potassium	**7810**	ug/L	500	146	1	11/09/21 10:13	11/10/21 13:27	7440-09-7	
Sodium	**26000**	ug/L	500	254	1	11/09/21 10:13	11/10/21 13:27	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**614**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**999**	mg/L	13.3	13.3	1		11/09/21 09:47		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**19.9**	mg/L	1.0	0.39	1		11/09/21 13:05	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	0.086	1		11/09/21 13:05	16984-48-8	
Sulfate	**249**	mg/L	20.0	8.4	20		11/10/21 18:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-UWL-FB-1 **Lab ID: 60385393007** Collected: 11/02/21 12:45 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**<8.6**	ug/L	100	8.6	1	11/09/21 10:13	11/10/21 13:30	7440-42-8	
Calcium	**<75.4**	ug/L	200	75.4	1	11/09/21 10:13	11/10/21 13:30	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/09/21 10:13	11/10/21 13:30	7439-89-6	
Magnesium	**<31.4**	ug/L	50.0	31.4	1	11/09/21 10:13	11/10/21 13:30	7439-95-4	
Manganese	**<0.74**	ug/L	5.0	0.74	1	11/09/21 10:13	11/10/21 13:30	7439-96-5	
Potassium	**<146**	ug/L	500	146	1	11/09/21 10:13	11/10/21 13:30	7440-09-7	
Sodium	**488J**	ug/L	500	254	1	11/09/21 10:13	11/10/21 13:30	7440-23-5	B
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**2.8**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**<5.0**	mg/L	5.0	5.0	1		11/09/21 09:48		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**0.44J**	mg/L	1.0	0.39	1		11/09/21 13:31	16887-00-6	B
Fluoride	**<0.086**	mg/L	0.20	0.086	1		11/09/21 13:31	16984-48-8	
Sulfate	**<0.42**	mg/L	1.0	0.42	1		11/09/21 13:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-BMW-1S **Lab ID: 60385386002** Collected: 11/01/21 12:10 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**77.0J**	ug/L	100	8.6	1	11/22/21 16:33	11/30/21 16:50	7440-42-8	
Calcium	**260000**	ug/L	2000	754	10	11/22/21 16:33	12/01/21 13:51	7440-70-2	
Iron	**29800**	ug/L	50.0	21.4	1	11/22/21 16:33	11/30/21 16:50	7439-89-6	
Magnesium	**57800**	ug/L	500	314	10	11/22/21 16:33	12/01/21 13:51	7439-95-4	
Manganese	**2940**	ug/L	5.0	0.74	1	11/22/21 16:33	11/30/21 16:50	7439-96-5	
Potassium	**5850**	ug/L	500	146	1	11/22/21 16:33	11/30/21 16:50	7440-09-7	
Sodium	**24900**	ug/L	500	254	1	11/22/21 16:33	11/30/21 16:50	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**696**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**953**	mg/L	13.3	13.3	1		11/09/21 09:45		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**13.7**	mg/L	1.0	0.39	1		11/19/21 17:41	16887-00-6	
Fluoride	**<0.086**	mg/L	0.20	0.086	1		11/19/21 17:41	16984-48-8	
Sulfate	**146**	mg/L	20.0	8.4	20		11/22/21 21:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-BMW-2S **Lab ID: 60385386003** Collected: 11/01/21 13:40 Received: 11/03/21 03:48 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 Pace Analytical Services - Kansas City								
Boron	**40.7J**	ug/L	100	8.6	1	11/22/21 16:33	11/30/21 16:52	7440-42-8	
Calcium	**140000**	ug/L	2000	754	10	11/22/21 16:33	12/01/21 13:57	7440-70-2	
Iron	**<21.4**	ug/L	50.0	21.4	1	11/22/21 16:33	11/30/21 16:52	7439-89-6	
Magnesium	**20400**	ug/L	50.0	31.4	1	11/22/21 16:33	11/30/21 16:52	7439-95-4	
Manganese	**4.3J**	ug/L	5.0	0.74	1	11/22/21 16:33	11/30/21 16:52	7439-96-5	
Potassium	**5460**	ug/L	500	146	1	11/22/21 16:33	11/30/21 16:52	7440-09-7	
Sodium	**3990**	ug/L	500	254	1	11/22/21 16:33	11/30/21 16:52	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**357**	mg/L	2.0	2.0	1		11/10/21 10:58		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**475**	mg/L	10.0	10.0	1		11/09/21 09:46		H1
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**1.7**	mg/L	1.0	0.39	1		11/19/21 18:07	16887-00-6	B
Fluoride	**0.14J**	mg/L	0.20	0.086	1		11/19/21 18:07	16984-48-8	
Sulfate	**46.2**	mg/L	5.0	2.1	5		11/19/21 18:21	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: AMEREN LCL1
Pace Project No.: 60385393

Sample: L-MW-26 **Lab ID: 60385386016** Collected: 11/04/21 12:55 Received: 11/06/21 05:30 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 Pace Analytical Services - Kansas City								
Boron	**68.7J**	ug/L	100	8.6	1	11/22/21 16:33	11/30/21 17:24	7440-42-8	
Calcium	**146000**	ug/L	2000	754	10	11/22/21 16:33	12/01/21 14:24	7440-70-2	
Iron	**43.7J**	ug/L	50.0	21.4	1	11/22/21 16:33	11/30/21 17:24	7439-89-6	
Magnesium	**26300**	ug/L	50.0	31.4	1	11/22/21 16:33	11/30/21 17:24	7439-95-4	
Manganese	**464**	ug/L	5.0	0.74	1	11/22/21 16:33	11/30/21 17:24	7439-96-5	
Potassium	**4310**	ug/L	500	146	1	11/22/21 16:33	11/30/21 17:24	7440-09-7	
Sodium	**6070**	ug/L	500	254	1	11/22/21 16:33	11/30/21 17:24	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B Pace Analytical Services - Indianapolis								
Alkalinity, Total as CaCO3	**390**	mg/L	2.0	2.0	1		11/12/21 11:19		
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City								
Total Dissolved Solids	**490**	mg/L	10.0	10.0	1		11/11/21 08:04		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Pace Analytical Services - Kansas City								
Chloride	**6.2**	mg/L	1.0	0.39	1		11/18/21 14:06	16887-00-6	B
Fluoride	**0.24**	mg/L	0.20	0.086	1		11/18/21 14:06	16984-48-8	
Sulfate	**29.3**	mg/L	5.0	2.1	5		11/18/21 15:02	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 755005
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

METHOD BLANK: 3021597 Matrix: Water
Associated Lab Samples: 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	11/10/21 12:51	
Calcium	ug/L	<75.4	200	75.4	11/10/21 12:51	
Iron	ug/L	<21.4	50.0	21.4	11/10/21 16:17	
Magnesium	ug/L	<31.4	50.0	31.4	11/10/21 16:17	
Manganese	ug/L	<0.74	5.0	0.74	11/10/21 12:51	
Potassium	ug/L	<146	500	146	11/10/21 16:17	
Sodium	ug/L	566	500	254	11/10/21 16:17	P8

LABORATORY CONTROL SAMPLE: 3021598

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	886	89	85-115	
Calcium	ug/L	10000	9670	97	85-115	
Iron	ug/L	10000	9820	98	85-115	
Magnesium	ug/L	10000	10300	103	85-115	
Manganese	ug/L	1000	924	92	85-115	
Potassium	ug/L	10000	9540	95	85-115	
Sodium	ug/L	10000	10800	108	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3021599 3021600

Parameter	Units	60385390001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	51.6J	1000	1000	989	971	94	92	70-130	2	20	
Calcium	ug/L	137000	10000	10000	144000	138000	70	14	70-130	4	20	
Iron	ug/L	49.3J	10000	10000	10300	10100	103	100	70-130	2	20	
Magnesium	ug/L	13000	10000	10000	22900	23300	100	103	70-130	1	20	
Manganese	ug/L	6.1	1000	1000	972	953	97	95	70-130	2	20	
Potassium	ug/L	3630	10000	10000	13500	13200	99	96	70-130	2	20	
Sodium	ug/L	15400	10000	10000	25200	25000	98	96	70-130	1	20	

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 757956
QC Batch Method: EPA 200.7
Analysis Method: EPA 200.7
Analysis Description: 200.7 Metals, Total
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385386002, 60385386003, 60385386016

METHOD BLANK: 3033339 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003, 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	<8.6	100	8.6	11/30/21 16:44	
Calcium	ug/L	<75.4	200	75.4	11/30/21 16:44	
Iron	ug/L	<21.4	50.0	21.4	11/30/21 16:44	
Magnesium	ug/L	<31.4	50.0	31.4	11/30/21 16:44	
Manganese	ug/L	<0.74	5.0	0.74	11/30/21 16:44	
Potassium	ug/L	<146	500	146	11/30/21 16:44	
Sodium	ug/L	<254	500	254	11/30/21 16:44	

LABORATORY CONTROL SAMPLE: 3033340

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	957	96	85-115	
Calcium	ug/L	10000	9800	98	85-115	
Iron	ug/L	10000	9780	98	85-115	
Magnesium	ug/L	10000	10100	101	85-115	
Manganese	ug/L	1000	979	98	85-115	
Potassium	ug/L	10000	9720	97	85-115	
Sodium	ug/L	10000	9980	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3033341 3033342

Parameter	Units	60385386004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	7500	1000	1000	8410	8280	91	77	70-130	2	20	
Calcium	ug/L	120000	10000	10000	128000	127000	87	74	70-130	1	20	
Iron	ug/L	5620	10000	10000	15700	15400	100	98	70-130	2	20	
Magnesium	ug/L	15500	10000	10000	25200	24800	96	93	70-130	1	20	
Manganese	ug/L	305	1000	1000	1300	1290	99	98	70-130	1	20	
Potassium	ug/L	8650	10000	10000	18800	18300	102	96	70-130	3	20	
Sodium	ug/L	121000	10000	10000	129000	127000	86	61	70-130	2	20	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3033343 3033344

Parameter	Units	60385386016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	68.7J	1000	1000	1060	1060	99	99	70-130	0	20	

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3033343 3033344

Parameter	Units	60385386016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	146000	10000	10000	158000	155000	123	95	70-130	2	20	
Iron	ug/L	43.7J	10000	10000	10200	10200	101	101	70-130	0	20	
Magnesium	ug/L	26300	10000	10000	36000	35900	97	96	70-130	0	20	
Manganese	ug/L	464	1000	1000	1490	1490	102	103	70-130	0	20	
Potassium	ug/L	4310	10000	10000	14500	14500	102	101	70-130	0	20	
Sodium	ug/L	6070	10000	10000	16400	16400	103	104	70-130	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 649386 | Analysis Method: SM 2320B
QC Batch Method: SM 2320B | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 60385386002, 60385386003, 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

METHOD BLANK: 2992253 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003, 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<2.0	2.0	2.0	11/10/21 10:58	

LABORATORY CONTROL SAMPLE: 2992254

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	49.1	98	90-110	

SAMPLE DUPLICATE: 2992255

Parameter	Units	60385386004 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	152	154	1	20	

SAMPLE DUPLICATE: 2992256

Parameter	Units	50301936001 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	687	690	0	20	

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REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 650018
QC Batch Method: SM 2320B
Analysis Method: SM 2320B
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Indianapolis
Associated Lab Samples: 60385386016

METHOD BLANK: 2995900 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	<2.0	2.0	2.0	11/12/21 11:19	

LABORATORY CONTROL SAMPLE: 2995901

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	48.5	97	90-110	

SAMPLE DUPLICATE: 2995902

Parameter	Units	60385386016 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	390	400	2	20	

SAMPLE DUPLICATE: 2995903

Parameter	Units	60385386023 Result	Dup Result	RPD	Max RPD	Qualifiers
Alkalinity, Total as CaCO3	mg/L	188	190	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 755000
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385386002, 60385386003, 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

METHOD BLANK: 3021558 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003, 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/09/21 09:43	

LABORATORY CONTROL SAMPLE: 3021559

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	960	96	80-120	

SAMPLE DUPLICATE: 3021560

Parameter	Units	60385384001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	617	609	1	10	

SAMPLE DUPLICATE: 3021561

Parameter	Units	60385386004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	790	838	6	10	

SAMPLE DUPLICATE: 3021562

Parameter	Units	60385390001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	423	431	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 755548
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385386016

METHOD BLANK: 3023486 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	5.0	11/11/21 08:03	

LABORATORY CONTROL SAMPLE: 3023487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	973	97	80-120	

SAMPLE DUPLICATE: 3023488

Parameter	Units	60385385001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4870	4660	4	10	

SAMPLE DUPLICATE: 3023489

Parameter	Units	60385386016 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	490	497	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 754912
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

METHOD BLANK: 3021296 Matrix: Water
Associated Lab Samples: 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.53J	1.0	0.39	11/09/21 08:03	
Fluoride	mg/L	<0.086	0.20	0.086	11/09/21 08:03	
Sulfate	mg/L	<0.42	1.0	0.42	11/09/21 08:03	

METHOD BLANK: 3024066 Matrix: Water
Associated Lab Samples: 60385393001, 60385393002, 60385393003, 60385393006, 60385393007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/10/21 10:55	
Fluoride	mg/L	<0.086	0.20	0.086	11/10/21 10:55	
Sulfate	mg/L	<0.42	1.0	0.42	11/10/21 10:55	

LABORATORY CONTROL SAMPLE: 3021297

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.5	90	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Sulfate	mg/L	5	4.8	96	90-110	

LABORATORY CONTROL SAMPLE: 3024067

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.5	99	90-110	
Sulfate	mg/L	5	5.3	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3021298 3021299

Parameter	Units	60385393001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.6	5	5	7.0	7.0	87	88	80-120	1	15	
Fluoride	mg/L	0.27	2.5	2.5	2.5	2.5	89	90	80-120	1	15	
Sulfate	mg/L	61.4	50	50	110	109	98	95	80-120	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

MATRIX SPIKE SAMPLE: 3021300

Parameter	Units	60385308002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	13.4	5	18.6	104	80-120	
Fluoride	mg/L	<0.086	2.5	2.5	101	80-120	
Sulfate	mg/L	2.5	5	7.5	101	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 757095
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385386016

METHOD BLANK: 3029711 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/18/21 06:44	
Fluoride	mg/L	<0.086	0.20	0.086	11/18/21 06:44	
Sulfate	mg/L	<0.42	1.0	0.42	11/18/21 06:44	

METHOD BLANK: 3030649 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/18/21 09:37	
Fluoride	mg/L	<0.086	0.20	0.086	11/18/21 09:37	
Sulfate	mg/L	<0.42	1.0	0.42	11/18/21 09:37	

METHOD BLANK: 3032082 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/19/21 06:45	
Fluoride	mg/L	<0.086	0.20	0.086	11/19/21 06:45	
Sulfate	mg/L	<0.42	1.0	0.42	11/19/21 06:45	

METHOD BLANK: 3032286 Matrix: Water
Associated Lab Samples: 60385386016

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.79J	1.0	0.39	11/20/21 13:49	
Fluoride	mg/L	<0.086	0.20	0.086	11/20/21 13:49	
Sulfate	mg/L	<0.42	1.0	0.42	11/20/21 13:49	

LABORATORY CONTROL SAMPLE: 3029712

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.5	100	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

LABORATORY CONTROL SAMPLE: 3029712

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

LABORATORY CONTROL SAMPLE: 3030650

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	100	90-110	
Fluoride	mg/L	2.5	2.5	102	90-110	
Sulfate	mg/L	5	5.5	109	90-110	

LABORATORY CONTROL SAMPLE: 3032083

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

LABORATORY CONTROL SAMPLE: 3032287

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.3	107	90-110	
Fluoride	mg/L	2.5	2.7	106	90-110	
Sulfate	mg/L	5	5.4	108	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3029713 3029714

Parameter	Units	60385386016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.2	5	5	11.1	11.2	96	99	80-120	1	15	
Fluoride	mg/L	0.24	2.5	2.5	2.8	2.9	103	106	80-120	3	15	
Sulfate	mg/L	29.3	25	25	53.9	53.8	98	98	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3029715 3029716

Parameter	Units	60385386023 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	18.9	10	10	29.5	30.0	105	110	80-120	2	15	
Fluoride	mg/L	0.36	5	5	5.5	5.8	103	108	80-120	4	15	
Sulfate	mg/L	246	100	100	354	344	107	98	80-120	3	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

QC Batch: 757277
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60385386002, 60385386003

METHOD BLANK: 3030419 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/19/21 06:45	
Fluoride	mg/L	<0.086	0.20	0.086	11/19/21 06:45	
Sulfate	mg/L	<0.42	1.0	0.42	11/19/21 06:45	

METHOD BLANK: 3032423 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	<0.39	1.0	0.39	11/21/21 17:33	
Fluoride	mg/L	<0.086	0.20	0.086	11/21/21 17:33	
Sulfate	mg/L	<0.42	1.0	0.42	11/21/21 17:33	

METHOD BLANK: 3034763 Matrix: Water
Associated Lab Samples: 60385386002, 60385386003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	0.45J	1.0	0.39	11/22/21 21:29	
Fluoride	mg/L	<0.086	0.20	0.086	11/22/21 21:29	
Sulfate	mg/L	<0.42	1.0	0.42	11/22/21 21:29	

LABORATORY CONTROL SAMPLE: 3030420

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	90-110	
Fluoride	mg/L	2.5	2.6	104	90-110	
Sulfate	mg/L	5	5.2	104	90-110	

LABORATORY CONTROL SAMPLE: 3032424

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	96	90-110	
Fluoride	mg/L	2.5	2.7	110	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: AMEREN LCL1
Pace Project No.: 60385393

LABORATORY CONTROL SAMPLE: 3034764

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	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3030421 3030422

Parameter	Units	60385384001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.1	5	5	15.9	16.2	96	101	80-120	2	15	
Fluoride	mg/L	0.21	2.5	2.5	2.5	2.6	92	97	80-120	5	15	
Sulfate	mg/L	39.2	25	25	62.9	63.1	95	96	80-120	0	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3030424 3030423

Parameter	Units	60385386004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	44.8	25	25	71.5	71.6	107	107	80-120	0	15	
Fluoride	mg/L	0.32	2.5	2.5	2.6	2.7	93	94	80-120	1	15	
Sulfate	mg/L	377	250	250	640	636	105	104	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3030425 3030426

Parameter	Units	60386286007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.4	10	10	30.2	30.1	108	108	80-120	0	15	
Fluoride	mg/L	ND	2.5	2.5	2.8	2.8	110	111	80-120	1	15	
Sulfate	mg/L	53.9	5	5	59.8	59.9	118	119	80-120	0	15	E

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: AMEREN LCL1
Pace Project No.: 60385393

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.

Reported results are not rounded until the final step prior to reporting. Therefore, calculated parameters that are typically reported as "Total" may vary slightly from the sum of the reported component parameters.

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.

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H1	Analysis conducted outside the EPA method holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
P8	Analyte was detected in the method blank. All associated samples had concentrations of at least ten times greater than the blank or were below the reporting limit.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: AMEREN LCL1
Pace Project No.: 60385393

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60385386002	L-BMW-1S	EPA 200.7	757956	EPA 200.7	758020
60385386003	L-BMW-2S	EPA 200.7	757956	EPA 200.7	758020
60385393001	L-TMW-1	EPA 200.7	755005	EPA 200.7	755084
60385393002	L-TMW-2	EPA 200.7	755005	EPA 200.7	755084
60385393003	L-TMW-3	EPA 200.7	755005	EPA 200.7	755084
60385393006	L-UWL-DUP-1	EPA 200.7	755005	EPA 200.7	755084
60385393007	L-UWL-FB-1	EPA 200.7	755005	EPA 200.7	755084
60385386016	L-MW-26	EPA 200.7	757956	EPA 200.7	758020
60385386002	L-BMW-1S	EPA 903.1	475154		
60385386003	L-BMW-2S	EPA 903.1	475154		
60385386016	L-MW-26	EPA 903.1	475154		
60385386002	L-BMW-1S	EPA 904.0	475155		
60385386003	L-BMW-2S	EPA 904.0	475155		
60385386016	L-MW-26	EPA 904.0	475155		
60385386002	L-BMW-1S	SM 2320B	649386		
60385386003	L-BMW-2S	SM 2320B	649386		
60385393001	L-TMW-1	SM 2320B	649386		
60385393002	L-TMW-2	SM 2320B	649386		
60385393003	L-TMW-3	SM 2320B	649386		
60385393006	L-UWL-DUP-1	SM 2320B	649386		
60385393007	L-UWL-FB-1	SM 2320B	649386		
60385386016	L-MW-26	SM 2320B	650018		
60385386002	L-BMW-1S	SM 2540C	755000		
60385386003	L-BMW-2S	SM 2540C	755000		
60385393001	L-TMW-1	SM 2540C	755000		
60385393002	L-TMW-2	SM 2540C	755000		
60385393003	L-TMW-3	SM 2540C	755000		
60385393006	L-UWL-DUP-1	SM 2540C	755000		
60385393007	L-UWL-FB-1	SM 2540C	755000		
60385386016	L-MW-26	SM 2540C	755548		
60385386002	L-BMW-1S	EPA 300.0	757277		
60385386003	L-BMW-2S	EPA 300.0	757277		
60385393001	L-TMW-1	EPA 300.0	754912		
60385393002	L-TMW-2	EPA 300.0	754912		
60385393003	L-TMW-3	EPA 300.0	754912		
60385393006	L-UWL-DUP-1	EPA 300.0	754912		
60385393007	L-UWL-FB-1	EPA 300.0	754912		
60385386016	L-MW-26	EPA 300.0	757095		

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60385393

60385393

Client Name: Golder Associates

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

Tracking #: _____ Pace Shipping Label Used? Yes ☐ No ☑

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

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☑ Other ☐

Thermometer Used: T-299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 2.5/2.2/1.6 Corr. Factor -0.2 Corrected 2.3/2.0/1.4

Temperature should be above freezing to 6°C 11.4/13.1 11.2/12.9

Date and initials of person examining contents: PV 11/8/21

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) LOT# 603173	☑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:

REVIEWED
By jchurch at 1:52 pm, 11/10/21

Project Manager Review: _____ Date: _____

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

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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:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates	Report To:	Jeffrey Ingram	Attention:	
Address:	13515 Barrett Parkway Drive, Ste 260	Copy To:	Ryan Feldmann/Eric Schneider	Company Name:	
	Ballwin, MO 63021			Address:	
Email To:	jeffrey_ingram@golder.com	Purchase Order No.:		Pace Quote Reference:	
Phone:	636-724-9191 Fax: 636-724-9323	Project Name:	Ameren LCL1	Pace Project Manager:	Jamie Church
Requested Due Date/TAT:	Standard	Project Number:	153-140603.0001C (COC #4)	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

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	Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		Y/N	N	N	N	N		60385393
1	L-TMW-1	WT	G			11/2/21	0930		2	1		1							X	X	X	X		
2	L-TMW-2	WT	G			"	1050		2	1		1							X	X	X	X		
3	L-TMW-3	WT	G			"	1220		2	1		1							X	X	X	X		
4	L-MW-26	WT	G		(B)	"	*																	
5	L-BMW-1S	WT	G			11/1/21	1210		2	1		1							X	X	X	X		
6	L-BMW-2S	WT	G			"	1340		2	1		1							X	X	X	X		
7	L-UWL-DUP-1	WT	G			11/2/21	—		2	1		1							X	X	X	X		
8	L-UWL-FB-1	WT	G			"	1245		2	1		1							X	X	X	X		
9	L-UWL-MS-1	WT	G																					
10	L-UWL-MSD-1	WT	G		(B)																			
11		WT	G																					
12		WT	G																					

BP3N BP1U

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B		11/2/21	1715	Angela McManus	11/3	8am
	Angela McMan	11/3/21	8am		11/3/21	0348

SAMPLE CONDITIONS

Temp In °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2-3	Y	Y	Y
2.0			
1.4			
1.2	N		

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Eric Schneider

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 11/02/21

Pace Analytical
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Sample Condition Upon Receipt

WO# : 60385393

60385393

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 ☑ SPLC

Thermometer Used: T219 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 1.1, 1.8, 15.7 **Corr. Factor** -0.2 **Corrected** 0.9, 1.6, 15.5, 0.4

Date and initials of person examining contents: SR 11/16/21

Temperature should be above freezing to 6°C 6.6, 14.2, 15.2, 13.1 14.2, 15.0, 7.9

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	TDS 11/10
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) LOT# 1003173	☑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:

REVIEWED
By jchurch at 1:53 pm, 11/10/21

Project Manager Review: _____ Date: _____

Pace Analytical
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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	Golder Associates
Address:	13515 Barrett Parkway Drive, Ste 260
	Ballwin, MO 63021
Email To:	jeffrey_ingram@golder.com
Phone: 636-724-9191	Fax: 636-724-9323
Requested Due Date/TAT:	Standard

Section B Required Project Information:

Report To:	Jeffrey Ingram
Copy To:	Ryan Feldmann/Eric Schneider
Purchase Order No.:	
Project Name:	Ameren LCL1
Project Number:	153-140603.0001C (COC #4)

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

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: Chloride/Fluoride/Sulfate	App III and Cat/An Metals	Alkalinity	TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
																		N	N	N	N		6038 5393
1	L-TMW-1	WT	G																				
2	L-TMW-2	WT	G																				
3	L-TMW-3	WT	G																				
4	L-MW-26	WT	G			11-4-21	1255		2	1		1						/	/	/	/		
5	L-BMW-1S	WT	G																				
6	L-BMW-2S	WT	G																				
7	L-UWL-DUP-1	WT	G																				
8	L-UWL-FB-1	WT	G																				
9	L-UWL-MS-1	WT	G			11-4-21	1255		2	1		1						/	/	/	/		
10	L-UWL-MSD-1	WT	G			11-4-21	1255		2	1		1						/	/	/	/		
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)
*EPA 200.7: Fe, Mg, Mn, K, Na, Ca, B	Sierra Shields / Golder	11/5/21	1520	Angie ML	11/5	1530	6.9	Y	Y	Y
	Angie ML	11/5	1530				1.6			
							5.4			
							2.9			

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Sierra Shields

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 11/5/21

MEMORANDUM

DATE January 7, 2022 **Project No.** 153140603

TO Project File
Golder Associates

CC Amanda Derhake, Jeff Ingram

FROM Annie Muehlfarth **EMAIL AMuehlfarth@golder.com**

DATA VALIDATION SUMMARY, LABADIE ENERGY CENTER – LCL1 – DETECTION MONITORING - DATA PACKAGE 60385393

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

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

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 - LEC - LCL1
Project Number: 153140603
Reviewer: A. Muehlfarth
Validation Date: 1/7/2022

Laboratory: Pace Analytical
SDG #: 60385393
Analytical Method (type and no.): EPA 200.7 (Total Metals); SM2320B (Alkalinity); SM2540C (TDS); EPA 300.0 (Anions)
Matrix: ☐ Air ☐ Soil/Sed. ■ Water ☐ Waste ☐
Sample Names L-TMW-1, L-TMW-2, L-TMW-3, L-UWL-DUP-1, L-UWL-FB-1, L-BMW-1S, L-BMW-2S, L-MW-26

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?	x			11/1/2021 - 11/4/2021
b) Sampling team indicated?	x			ETF/BTT/
c) Sample location noted?	x			
d) Sample depth indicated (Soils)?			x	
e) Sample type indicated (grab/composite)?	x			Grab
f) Field QC noted?	x			See Notes
g) Field parameters collected (note types)?	x			pH, Sp.Cond, ORP, Temp, DO, Turb
h) Field Calibration within control limits?	x			
i) Notations of unacceptable field conditions/performances from field logs or field notes?		x		
j) Does the laboratory narrative indicate deficiencies?			x	

Note Deficiencies:

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

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

QA LEVEL II - INORGANIC DATA EVALUATION CHECKLIST

Blanks	YES	NO	NA	COMMENTS
a) Were analytes detected in the method blank(s)?	x			See Notes
b) Were analytes detected in the field blank(s)?	x			See Notes
c) Were analytes detected in the equipment blank(s)?			x	
d) Were analytes detected in the trip blank(s)?			x	

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

Duplicates	YES	NO	NA	COMMENTS
a) Were field duplicates collected (note original and duplicate sample names)?	x			L-UWL-DUP-1 @ L-TMW-2
b) Were field dup. precision criteria met (note RPD)?	x			
c) Were lab duplicates analyzed (note original and duplicate samples)?	x			
d) Were lab dup. precision criteria met (note RPD)?	x			Max RPD: 6% [<10%]

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

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

Comments/Notes:

TDS was analyzed outside of hold time in samples L-BMW-1S, L-BMW-2S. Results were qualified as estimates.

Calcium, magnesium, and sulfate were analyzed at a dilution in multiple samples. No qualification necessary.

Blanks:

3021597: Sodium (566). Associated with samples -93001 through -93003, -93006, -93007. Sample results >RL and 10x blank were not qualified. Results <RL were reported at the RL and qualified as non-detect.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Comments/Notes:

3021296: Chloride (0.53J). Associated with samples -93001 through -93003, -93006, -93007. Results >RL but <10x blank were qualified as estimates. Results >RL and 10x blank were not qualified. Results <RL were reported at the RL and qualified as non-detect.

3032286: Chloride (0.79J). Associated with sample -86016. Result >RL but <10x blank, qualified as an estimate.

3034763: Chloride (.45J). Associated with samples -86002, -86003. Results >RL but <10x blank, qualified as an estimate. Results >RL and 10x blank were not qualified.

L-UWL-FB-1 @ L-TMW-3: Sodium (488J), alkalinity (2.8), chloride (0.44J). Results >RL and 10x blank were not qualified. 3. Results >RL but <10x blank, qualified as an estimate.

Duplicates:

L-UWL-DUP-1 @ L-TMW-2: Max RPD: 12.8% (<20%) for fluoride.

Laboratory analyzed sample duplicates for alkalinity and TDS.

MS/MSD:

3021599/3021600: MSD % recovery low for calcium. MS/MSD performed on unrelated sample, no qualification necessary.

3033341/3033342: MSD % recovery low for sodium. MS/MSD performed on unrelated sample, no qualification necessary.

QA LEVEL IV - INORGANIC DATA EVALUATION CHECKLIST

Data Qualification:

Sample Name	Constituent(s)	Result	Qualifier	Reason
L-BMW-1S	TDS	953	J	Analyzed outside of hold time
L-BMW-2S	"	475	J	"
L-UWL-FB-1	Sodium	500	U	Detected in MB, RL > result > MDL
"	Chloride	1.0	U	"
L-TMW-1	"	2.6	J	Detected in MB, 10x blank > result > RL
L-MW-26	"	6.2	J	"
L-BMW-2S	"	1.7	J	"
L-TMW-3	"	3.8	J	Detected in MB and FB, 10x blank > result > RL

Signature: Ann Muehlfarth Date: 1/7/2022

APPENDIX B

Alternative Source Demonstration - November 2020 Sampling Event

LCL1 - Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

Ameren Missouri

1901 Chouteau Ave, St. Louis, MO 63103

Submitted by:

Golder Associates Inc.

13515 Barrett Parkway Drive, Suite 260

Ballwin, MO 63021, USA

+1 314 984 8800

June 9, 2021

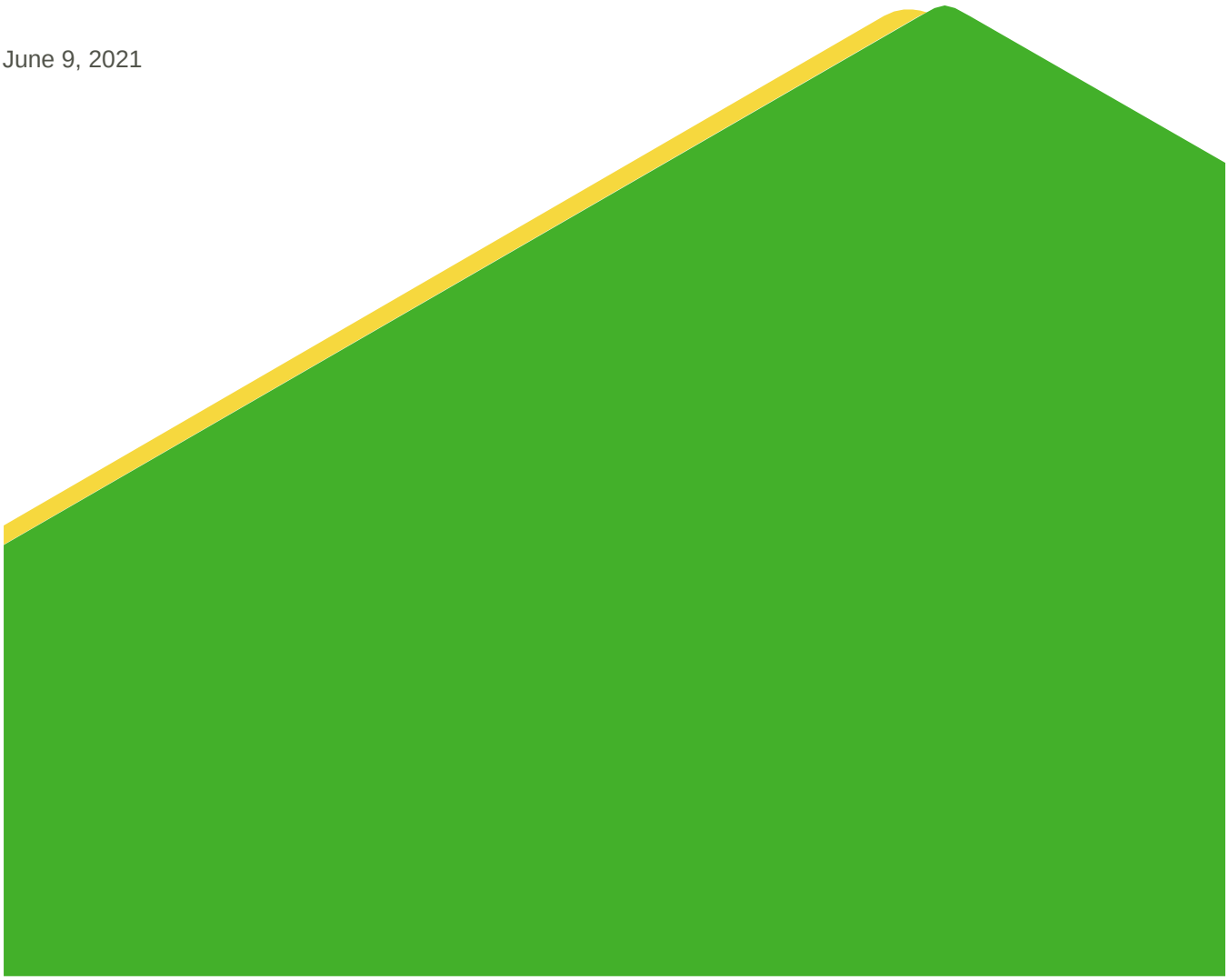

Table of Contents

Tables

Figures

CERTIFICATION STATEMENT

This *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* located at 226 Labadie Power Plant Road, Labadie Missouri 63055 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES INC.

_____

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

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this *LCL1 – Alternative Source Demonstration* has been prepared to document an Alternative Source Demonstration (ASD) for a Statistically Significant Increase (SSI) calculated at Ameren Missouri's (Ameren) Labadie Energy Center (LEC), Utility Waste Landfill (UWL) LCL1 or Cell 1. This document satisfies the requirements of §257.94(e)(2) which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

2.0 SITE DESCRIPTION AND BACKGROUND

The LEC is located approximately 35 miles west of downtown St. Louis in Franklin County, Missouri, just south of the Missouri River. **Figure 1** depicts the site location and layout, including the location of LCL1. The LEC encompasses approximately 2,400 acres and is located within the Missouri River Valley. The facility is bounded to the north by the Missouri River, to the west by Labadie Creek, to the northeast and east by agricultural land, and to the south by a railroad line and bedrock bluffs.

2.1 Geological and Hydrogeological Setting

The site lies between the Missouri River (to the north) and bedrock bluffs (to the south). Flow and deposition from the Missouri River have resulted in thick alluvial deposits which lie on top of bedrock. These alluvial deposits, which can range from approximately 90 to 120 feet thick, comprise the uppermost aquifer. Overall, this alluvial aquifer is described as a fining-upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Based on drilling records, the alluvial aquifer is divided into sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region consists of Ordovician-aged rock. Formations include primarily limestone, dolomite, sandstone, and shale and are comprised of the Plattin Group, Joachim Dolomite, St. Peter Sandstone, Powell Dolomite, and the Cotter/Jefferson City Dolomites.

2.2 Utility Waste Landfill Cell 1 – LCL1

UWL Cell 1 is referred to by Ameren as the LCL1, or Cell 1. The LCL1 is approximately 31 acres in size and is located east of the generating plant (**Figure 1**). The CCR Unit manages CCR from the LEC and is permitted to accept fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. Currently, the LCL1 is used for the disposal of dry disposal of fly ash and bottom ash from the LEC.

The LCL1 was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil High Density Polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2013 Proposed Construction Permit application (Gredell and Reitz & Jens, 2013).

A groundwater monitoring well network was installed in 2013 and 2014 in order to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 36 monitoring wells surrounding the current and future extents of the UWL (**Figure 1**). Most of these monitoring wells are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for groundwater. Three (3) monitoring wells (MW-33(D), MW-34(D), and MW-35(D)) are installed in the

intermediate/deeper zones of the alluvial aquifer. Groundwater samples have been collected in most of these monitoring wells since April 2013 and tested for the MDNR UWL parameters. In April 2017, four (4) monitoring wells were installed and added to this network along Labadie Bottoms Road (S-1, S-2, S-3, and S-4).

The permit for the LCL1 was issued October 27, 2016 (permit #0907101). Eleven (11) sampling events were performed prior to October 27, 2016 at most of the state required UWL monitoring wells and four (4) rounds of baseline CCR Rule sampling were completed at CCR Rule monitoring wells (discussed below). These results represent groundwater quality prior to CCR placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

2.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following was completed prior to the October 17, 2017 deadline; (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the LCL1 consists of six (6) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two (2) existing monitoring wells (MW-26 and TMW-1) were installed by Reitz & Jens, Inc. in 2013 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-2, TMW-3, BMW-1S, and BMW-3S) were installed by Golder in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information regarding the design and installation of the monitoring wells is provided in the LCL1 GMP (Golder, 2017) and the LCL1 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight (8) baseline sampling events were completed for the LCL1. After baseline sampling, Detection Monitoring events have been completed twice a year generally once in Q2 and once in Q4. November 2020 was the last Detection Monitoring sampling event. Laboratory testing was performed for the following Appendix III constituents during each Detection Monitoring event:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

In January 2018, background results from the eight (8) baseline sampling events were used to calculate statistical upper prediction limits (UPL). These UPLs were then compared to the Detection Monitoring results. If results from Detection Monitoring events were higher than the calculated UPL, is the results was considered an initial exceedance, and verification sample was performed in accordance with the LCL1 statistical analysis plan. Per the statistical analysis plan, after the May 2019 sampling event, the UPLs were updated to incorporate results from four (4) of the Detection Monitoring events.

In November 2017, no exceedances were reported. In May 2018, four (4) initial exceedances were identified including boron, fluoride, and total dissolved solids (TDS) at TMW-1 as well as fluoride at TMW-2. Verification sampling results confirmed all four (4) SSIs. An ASD was prepared for the May 2018 results and is available in the 2018 LCL1 Annual Report; that ASD concluded that the SSIs observed for the May 2018 sampling event were not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2018, four (4) initial exceedances were identified for boron, chloride and fluoride at TMW-1 and fluoride at TMW-2, three (3) of which were the same at those reported during May 2018. Verification sampling results confirmed only the fluoride at TMW-1 result. An ASD was prepared for the November 2018 results and is available in the 2019 LCL1 Annual Report; that ASD also concluded that the confirmed SSI observed for November 2018 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In May 2019, seven (7) initial exceedances were identified for pH, calcium, chloride, and fluoride at various wells. Verification sampling results confirmed only chloride at TMW-1. An ASD was prepared for the May 2019 results and is available in the 2019 LCL1 Annual Report. This ASD also concluded that the confirmed SSI observed for May 2019 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2019, four (4) initial exceedances were identified for boron, chloride, and TDS at MW-26 and chloride at TMW-1. Verification sampling results only confirmed the three (3) SSIs at MW-26. An ASD was prepared for the November 2019 results and is available in the 2020 LCL1 Annual Report, which concluded that the SSIs observed in the November 2019 sampling event were not caused by the LCL1. The SSI observed for TDS at MW-26 was primarily caused by relatively low calculated UPLs that did not reflect the full, natural geochemical variability within the alluvial aquifer. The SSIs identified for boron and chloride were primarily caused by the LCL1 being downgradient from the LCPA, which is currently in corrective action. The LCPA, and not the LCL1, was identified as the source for the November 2019 SSIs.

In November 2020, six (6) initial exceedances were identified for calcium, chloride, fluoride, sulfate and TDS at several wells. Verification sampling results only confirmed the four (4) SSIs at TMW-2. Results from these sampling events are provided in **Table 1**.

3.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

The SSIs for calcium, chloride, sulfate and TDS occurred at monitoring well TMW-2 and the values are provided on **Table 1**. TMW-2 is screened in the upper portion of the alluvial aquifer just below the average seasonal low for groundwater. As shown on **Figure 1**, TMW-2 is located to the northeast of the LCL1, as well as east of the generating plant and the two surface impoundments (LCPA and LCPB). Closure activities were initiated for both LCPA and LCPB during 2019 and are to be completed in 2021.

Based on Golder's review of the pre-disposal data discussed in Section 2.2 above, as well as our comparison of the pre-disposal data with the results from the eight (8) CCR-Rule baseline events, the groundwater at the LCL1 contains low-level, pre-existing CCR impacts from units/activities that pre-dated disposal activities in the LCL1. As a result of these pre-existing impacts, the LCL1 statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from the background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

4.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSIs at TMW-2 are not the result of a release from the LCL1, but are rather from an alternative source. The following detail the different lines of evidence that support this ASD:

- Pre-existing, low level concentrations of CCR indicators in groundwater that pre-date the LCL1 operation.
- Construction of the LCL1 with a 60-mil geomembrane liner and a 2-foot thick clay barrier.
- Groundwater results from nearby and background monitoring wells.
- Groundwater flow direction within the uppermost alluvial aquifer.
- Prepartion of geochemical models displaying current and historical groundwater chemistries.

4.1 CCR Indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 2** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 2: Types of CCR and Typical Indicator Parameters

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

Notes:

1) Fly ash and boiler slag/bottom ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.
3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

4.2 Analysis of Key Indicator Results at TMW-2

4.2.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. If groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement. **Figure 2** displays boron concentrations at TMW-2 as well as the two background wells for the LEC for the entire historical monitoring period. At TMW-2, boron concentrations have varied over time with values ranging between 86.8 J and 132 micrograms per liter (µg/L). The intrawell UPL for boron at TMW-2 is 136.3 µg/L. Through this same timeframe, boron results in the background wells BMW-1S and BMW-2S, located approximately 2.5-miles to the west of the LCL1, and 1.5-miles west of the LCPA have shown values ranging between non-detect (< 50 µg/L) to 151 µg/L. The interwell UPL for boron (based on the LEC background wells) is 147 µg/L.

As displayed in **Figure 2**, current boron concentrations at TMW-2 are below the UPL for both TMW-2 and the background monitoring wells and are consistent with previous results. The absence of boron exceedances at TMW-2 demonstrates that elevated concentrations for other constituents are likely related to an alternative source, rather than the LCL1. Additionally, results from the April 2021 sampling event for TMW-2 is 98.3 J µg/L, further displaying the temporal variability within the alluvial aquifer at the LCL1.

4.2.2 Geochemical Analysis

During Detection Monitoring events, major cation and anion concentrations were collected. These data were used to compare major ion chemistry over time to see if the groundwater chemistry is changing, which is expected to be a key indicator if impacts are present from the LCL1.

4.2.2.1 Stiff Diagrams

Stiff diagrams visually display the major cation and anion data. **Figure 3** displays the Stiff diagrams from the November 2020 and previous Detection Monitoring events. Data from the November 2020 Detection Monitoring event and all the previous Detection Monitoring events display nearly identical distribution (i.e., the shape of the Stiff diagram is very consistent over time). If impacts from the LCL1 were causing the apparent SSIs, a shift in groundwater chemistry would be expected. **Figure 3** demonstrates that there has not been a shift in groundwater chemistry over time and thus the recent SSIs are not a result of influence from LCL1.

4.2.2.2 Piper Diagram

A Piper diagram is a graphical technique used to classify different groundwater chemistry. The same data used to generate the Stiff diagram were plotted on a ternary Piper diagram according to major cation and anion concentrations. In addition to showing instantaneous concentrations, Piper diagrams can be used to determine if groundwater chemistry is changing, either spatially or temporally. **Figure 4** displays a Piper diagram for TMW-2 over time. If CCR impacts from the LCL1 were causing the apparent SSIs, then a shift in groundwater chemistry would be expected. **Figure 4** demonstrates that there has not been a shift in groundwater chemistry and thus the recent SSIs are not a result of influence from LCL1.

Additionally, a comparison of this diagram with those in the previous LCPB and LCL1 ASDs, found in the respective LCPB and LCL1 Annual Reports, (Golder, 2019a; Golder, 2019b; Golder, 2020) shows that

groundwater chemistry in TMW-2 plots in the area for background groundwater, further indicating a lack of impacts from LCL1.

4.3 Evaluation of SSIs at TMW-2

4.3.1.1 Calcium Concentrations

Calcium is not listed in **Table 2** as a typical indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017) because it typically has low concentrations in CCR leachate compared to groundwater. However, calcium can be a CCR indicator if concentrations in the source are higher than background levels. As shown in Section 4.1, calcium is typically a key indicator for FGD type wastes, but there are no FGD wastes at the LEC. Instead, fly ash and bottom ash/boiler slag are the typical wastes in the LCPA, LCPB, and LCL1.

Figure 5 displays calcium concentrations over time at TMW-2 as well as background monitoring wells BMW-1S and BMW-2S. As shown in **Figure 5**, calcium concentrations for the November 2020 and the subsequent verification sampling event are 197,000 and 207,000 µg/L, respectively. The calculated UPL for calcium at TMW-2 is 195,768 µg/L. Historically, based on CCR Rule sampling, calcium concentrations at TMW-2 have ranged from 156,000 to 195,000 µg/L. Background monitoring wells (BMW-1S and BMW-2S) have calcium concentrations ranging from 116,000 to 219,000 µg/L with a UPL of 219,000 µg/L. Additionally, during the November 2017 ASD Investigation (Golder, 2019a), total calcium concentrations within the pore-water of the LCPA ranged from 76,500 to 106,000 µg/L.

Figure 5 shows that the higher values reported for calcium in TMW-2 during the November 2020 sampling event, while elevated with respect to historical data at TMW-2, are well within the range of background data for wells located 2.5-miles upgradient of the LCL1. The calcium values are also above those present in the porewater of the CCR Unit in corrective action, the LCPA. Similar to the LCPA, the LCL1 manages CCR materials. This demonstrates that calcium is not a good indicator of CCR impacts for this site, and elevated concentrations in calcium are likely from an alternative source.

This information, along with a lack of elevated boron concentrations and the consistency of groundwater chemistry over time, indicates that the recent SSI for calcium in TMW-2 in November 2020 was not caused by a release from the LCL1, but instead is attributed to one or more potential sources, including (1) seasonality in the alluvial aquifer, (2) a relatively small set of baseline data that do not reflect the full natural temporal and spatial variability within the alluvial aquifer, or (3) testing variability.

4.3.1.2 Chloride Concentrations

Chloride is not listed in **Table 2** as a typical indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017) because it typically has low concentrations in CCR leachate relative to typical background. Like calcium, chloride can be a CCR indicator if concentrations in the source are higher than background levels. Chloride is typically a key indicator for FGD type wastes and is commonly found near salt and brine treated roadways where it can be a good indicator because it, like boron, has high mobility and low reactivity in most aquifer conditions.

Concentrations for the November 2020 sampling event and subsequent verification sampling event are 8.2 and 11.8 milligrams per liter (mg/L), respectively. The calculated UPL for TMW-2 is 7.116 mg/L. Historically, based on CCR Rule sampling, chloride concentrations have ranged from 3.8 to 6.9 mg/L. Background monitoring wells located approximately 2.5-miles upgradient from the LCL1 have had chloride concentrations ranging from 1.3 to 7.4 mg/L with an UPL of 7.654 mg/L and a couple of high outliers at 8.2 and 21.2 mg/L. **Figure 6** displays chloride concentrations over time at TMW-2 as well as background monitoring wells BMW-1S and BMW-2S.

TMW-2 is located approximately 30 feet south of a gravel portion of the Labadie Bottoms Road, approximately 200 feet east of the gravel perimeter road around the LCL1 and approximately 2,000 feet east of the paved portion of Labadie Bottoms Road and the haul road into the LCL1 . Road salt (NaCl) used to melt snow and ice on roadways is a common source for chloride, especially in monitoring wells near roadways. Road salt impacts typically result in increased concentrations of chloride and sodium. As displayed in **Figure 7**, there is correlation between the variability in sodium and chloride concentrations, with slight increases in the November 2020 sampling event, indicating that these two constituents are moving together through the aquifer, which would be expected if the increases are result of road salt.

The net groundwater flow direction in the alluvial aquifer around the LCL1 is towards the north/northeast (Golder, 2021). In 2020, an ASD was written for temporary elevated chloride concentrations at MW-26, and this ASD (Golder, 2021) indicated that elevated chloride concentrations were not from the LCL1, but rather an alternative source. TMW-2 is typically on the downgradient side of the LCL1, such that elevated concentrations at upgradient well MW-26 would be expected to move towards TMW-2. **Figure 8** is a box and whiskers plot that displays the chloride concentration from monitoring wells upgradient of the LCL1 to the November 2020 sampling result at TMW-2. As displayed in **Figure 8**, the results from the November 2020 sampling event at TMW-2 are well within the range of chloride results from wells upgradient of the LCL1.

This information, along with an apparent lack of elevated boron concentrations and the consistency of the geochemical signature in TMW-2, indicate that the recent SSI for chloride in TMW-2 in November 2020 was not caused by a release from the LCL1, but instead is attributed to one or more potential sources, including (1) seasonality in the alluvial aquifer, (2) low-level influence from historical road salt applications west of the LCL1 or (3) testing variability. The possibility of testing variability is supported by the result from the April 2021 sampling event for TMW-2, which was 6.3 mg/L, and is within the historical UPL for TMW-2. This further displays the temporal variability within the shallow zone of the alluvial aquifer and that elevated concentrations during the November 2020 sampling event are not from the LCL1.

4.3.1.3 Sulfate Concentrations

Sulfate, much like boron, can be an indicator of CCR impacts, because sulfate is mobile in most hydrogeological environments, except where conditions are strongly reducing. The groundwater around the LCL1 does not demonstrate strongly reducing conditions, which would include negative oxidation reduction potential (ORP) and hydrogen sulfide odors in the groundwater at the LCL1. If the SSIs for calcium, chloride, sulfate, and TDS were caused by impacts from the LCL1, sulfate values would be expected to increase following placement of CCR. Given that boron concentrations and the geochemical signature are not indicative of CCR impacts, it follows that the elevated sulfate values in well TMW-2 are from an alternative source.

Figure 9 displays sulfate concentrations over time at TMW-2 as well as background monitoring wells BMW-1S and BMW-2S. Concentrations for the November 2020 sampling event and subsequent verification sampling event are 116 and 150 mg/L, respectively. The calculated UPL for TMW-2 is 109.9 mg/L. Historically, based on CCR Rule sampling, sulfate concentrations have ranged from 63.9 to 99.8 mg/L at TMW-2. Background monitoring wells located approximately 2.5-miles upgradient from the LCL1 have had sulfate concentrations ranging from 12.3 to 65.3 mg/L with an UPL of 75.37 and a couple of high outliers at 157 and 246 mg/L.

Like in the analysis for chloride, **Figure 10** is a box and whisker plot that compares the sulfate concentrations at TMW-2 with the upgradient monitoring wells. As displayed in **Figure 10**, the results from the November 2020 sampling event at TMW-2 are within the range of sulfate results upgradient of the LCL1 that would be expected to move beneath the unit.

This information, along with an absence of elevated boron and consistent geochemical signature in TMW-2, indicates that the relatively elevated concentration for sulfate in TMW-2 in November 2020 was not caused by a release from the LCL1, but instead is attributed to one or more of potential sources: (1) natural variability and seasonality in the alluvial aquifer during the November 2020 sampling event, (2) existing low-level impacts from the LCPA, or (3) testing variability. The possibility of testing variability is supported by the result from the April 2021 sampling event for TMW-2 which was 103 mg/L and is below the intrawell UPL for TMW-2. Further, the April 2021 result displays the temporal variability within the shallow zone of the alluvial aquifer and that elevated concentrations during the November 2020 sampling event are not from the LCL1.

4.3.1.4 Total Dissolved Solids Concentrations

TDS alone is not known to be a fly ash or boiler slag/bottom ash indicator (EPRI 2017, EPRI 2012). The concentration of TDS is largely based on the concentration of major ions in groundwater (calcium, magnesium, sodium, potassium, carbonates, chloride, sulfate, etc.). Although TDS alone is not a key indicator of CCR impacts, an increase in some of the major ions associated with CCR (calcium, sodium, chloride, and sulfate) can represent CCR impacts.

The TDS concentrations for the November 2020 and subsequent verification sampling event are 801 and 837 mg/L, respectively. The calculated UPL for TDS in TMW-2 is 767.8 mg/L. Historically, based on CCR Rule sampling, TDS concentrations have ranged between 653 and 755 mg/L. As shown on **Figure 11**, background monitoring wells BMW-1S and BMW-2S have had TDS concentrations ranging from 366 to 792 mg/L with a UPL of 792 mg/L and a high outlier at 958 mg/L. As shown in **Figure 11,** the historical results for upgradient well BMW-1S are very similar to those for TMW-2.

Additionally, during the November 2017 ASD Investigation (Golder, 2018a), TDS concentrations within the porewater of the LCPA ranged from 528 to 642 mg/L. Thus, the lowest concentration reported for TMW-2 is above the highest concentration reported for the LCPA porewater. This demonstrates that TDS is not a good indicator of CCR impacts for this site, and elevated concentrations in TDS are likely from an alternative source.

Like in the analyses for chloride and sulfate above, **Figure 12** is a box and whisker plot that compares the TDS concentrations at TMW-2 with the upgradient monitoring wells. As displayed in **Figure 12**, the results from the November 2020 sampling event at TMW-2 are within the range of TDS results upgradient of the LCL1.

This information, along with an apparent lack of increasing boron and stable geochemical conditions, indicates that the higher concentration for TDS in TMW-2 in November 2020 was not caused by a release from the LCL1, but instead is attributed to one or more sources: (1) natural variability and seasonality in the alluvial aquifer during the November 2020 sampling event, (2) a relatively small set of baseline data that do not reflect the full natural temporal and spatial variability within the alluvial aquifer, or (3) testing variability. The possibility of testing variability is supported by the result from the April 2021 sampling event for TMW-2 which was 750 mg/L and is below the historical intrawell UPL for TMW-2. Further, the April 2021 result for TDS displays the temporal variability within the shallow zone of the alluvial aquifer and that elevated concentrations during the November 2020 sampling event are not from the LCL1.

5.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented in Section 4.0 above, the SSIs reported for the November 2020 monitoring event at TMW-2 are not a result of impacts from the LCL1. The SSIs appear to be a result of numerous factors, including (1) pre-existing low concentrations of CCR indicators from the upgradient LCPA that pre-date the LCL1, (2) relatively low calculated UPLs, (3) a relatively small set of baseline data that do not reflect the full natural temporal and spatial variability within the alluvial aquifer, (4) salt/brine application on perimeter roadways, and (5)

potential sampling or laboratory testing variability. Only twelve (12) samples have been used thus far to calculate the intrawell UPLs. It can take many years of data gathering to experience a range of variability that is representative of natural conditions for any given aquifer. The results gathered thus far have apparently not captured the full extent of the natural spatial and temporal variability in the alluvial aquifer at the LEC.

Further, the April 2021 sampling results for each of the SSIs reported in November 2020 also provide a strong indication that the SSIs may be the result of laboratory testing or sampling variability. With the exception of calcium, the results reported for April 2021 for each of the November 2020 SSI are below intrawell UPLs. While the calcium concentration exceeds the TMW-2 UPL, calcium is well below the background UPL.

Finally, the construction of the LCL1, with 2-feet of compacted clay overlain by a 60-mil HDPE liner, also limits the potential that the November 2020 SSIs reported for TMW-2 are a result influence from LCL1. SSIs observed in TMW-2 are not caused by impacts from the LCL1.

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Tables

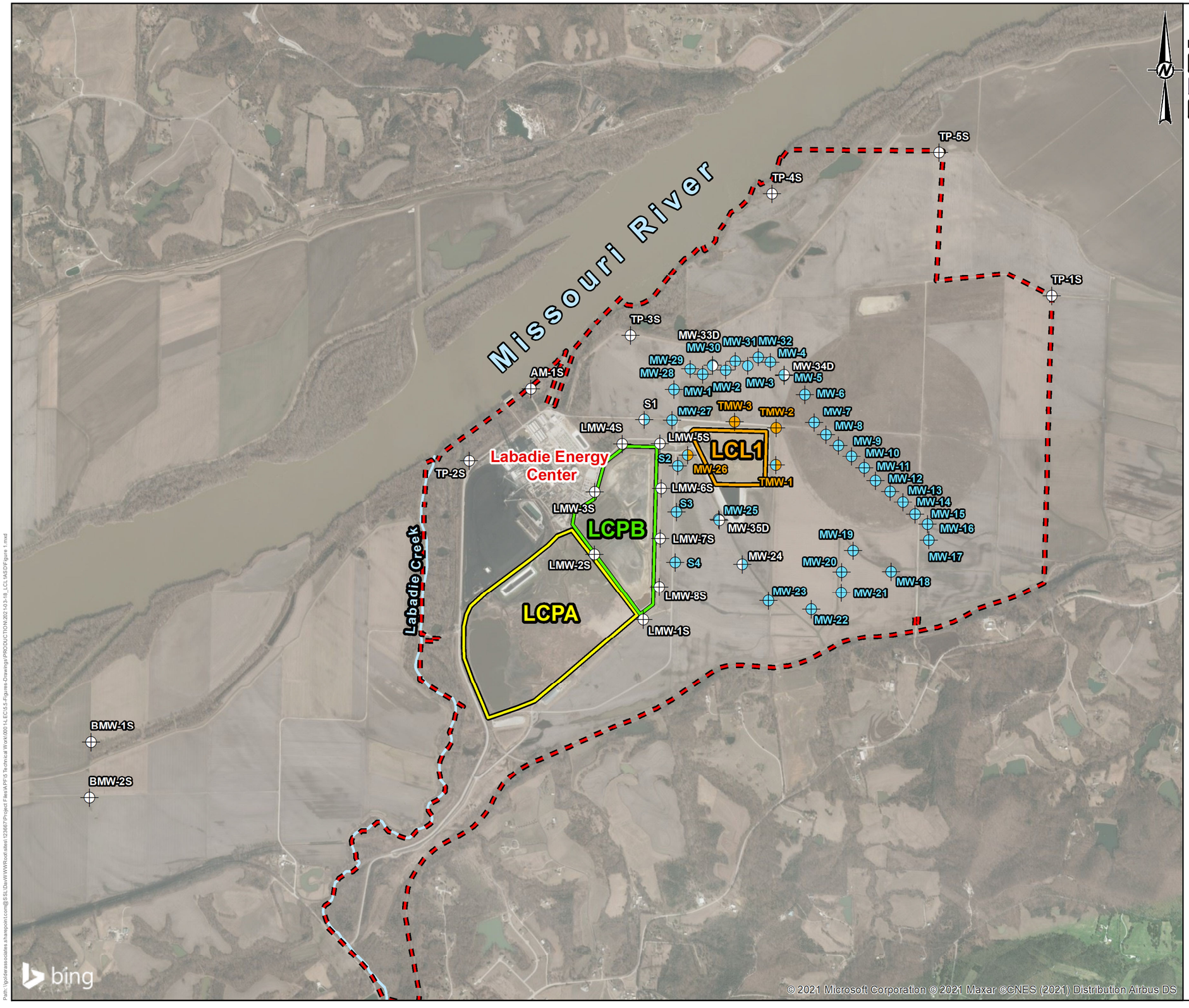
Table 1
November 2020 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
November 2020 Detection Monitoring Event											
DATE	NA	11/2/2020	11/2/2020	NA	11/2/2020	NA	11/3/2020	NA	11/3/2020	NA	11/3/2020
pH	SU	6.87	7.23	6.02-7.44	7.00	6.623-7.19	6.95	6.42-7.17	6.89	5.83-7.07	6.84
BORON, TOTAL	µg/L	99.0 J	45.2 J	DQR	63.6 J	139.7	103	136.3	132	139.7	128
CALCIUM, TOTAL	µg/L	216,000	142,000	182,000	119,000	177,907	142,000 J	195,768	197,000	208,416	172,000
CHLORIDE, TOTAL	mg/L	6.4	3.4	5.922	5.9	4.246	1.8	7.116	8.2	8.166	5.3
FLUORIDE, TOTAL	mg/L	0.17 J	0.22	0.2237	0.22	0.2916	0.33	0.2707	0.25	DQR	0.27
SULFATE, TOTAL	mg/L	66.5	73.4	33.4	29.8	122.2	30.9	109.9	116.0	109.6	56.1
TOTAL DISSOLVED SOLIDS	mg/L	780	524	520.2	420	733.7	579	767.8	801	756.6	651
January 2021 Verification Sampling Event											
DATE	NA						1/6/2021		1/5/2021		1/6/2021
pH	SU										
BORON, TOTAL	µg/L										
CALCIUM, TOTAL	µg/L								207,000		
CHLORIDE, TOTAL	mg/L								11.8		
FLUORIDE, TOTAL	mg/L						0.21				0.17 J
SULFATE, TOTAL	mg/L								150		
TOTAL DISSOLVED SOLIDS	mg/L								837		

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. NA - Not applicable.
4. Prediction Limits calculated using Sanitas Software.
5. Values highlighted in yellow indicate a Statistically Significant Increase (SSI).
6. Values highlighted in green indicate an initial exceedance above the prediction limit that was not confirmed by Verification Sampling (not an SSI).
7. Only analytes/wells that were detected above the prediction limit were tested during Verification Sampling.
8. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

Figures



LEGEND

- Labadie Energy Center Property Boundary
- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment
- LCL1 - UWL Cell 1

Alluvial Aquifer Monitoring Well Location

- LCL1 Monitoring Well
- LCL1 and State UWL Monitoring Well
- Additional CCR Rule Program Monitoring Well
- State UWL Monitoring Well
- CCR Rule and State UWL Monitoring Well

KEY MAP

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. UWL - UTILITY WASTE LANDFILL.
3. CCR - COAL COMBUSTION RESIDUALS.

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0 500 1,000 2,000 3,000 4,000 Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
SITE AERIAL AND SELECTED MONITORING WELLS LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2020-06-03
PREPARED	RJF
DESIGN	JSI
REVIEW	BTT
APPROVED	MNH

PROJECT No. 153-140603
PHASE 0001
FIGURE 1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1 in 0

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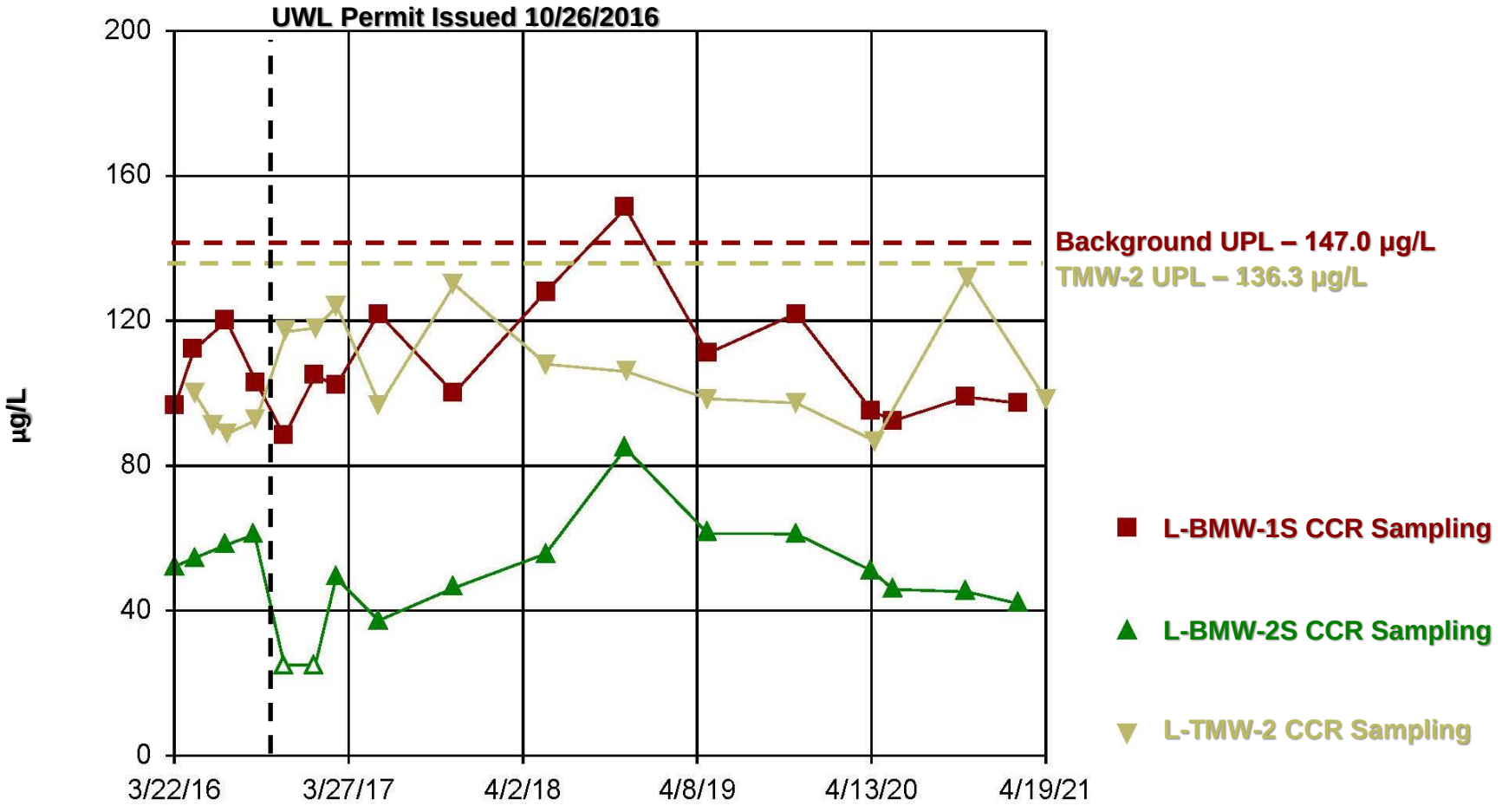
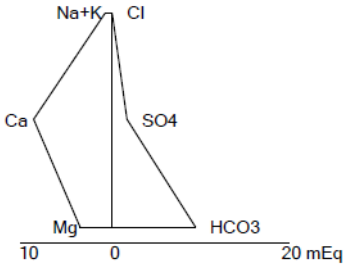


Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

CLIENT/PROJECT						TITLE				
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER		**Timeseries Plot of Boron Concentrations at TMW-2**				
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **2**



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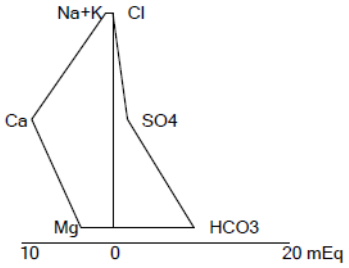

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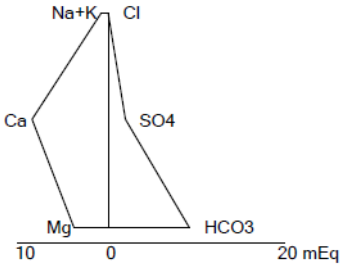

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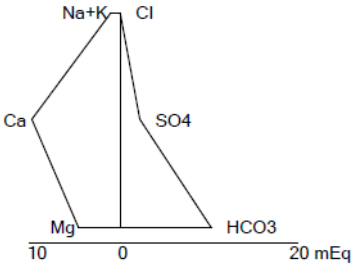

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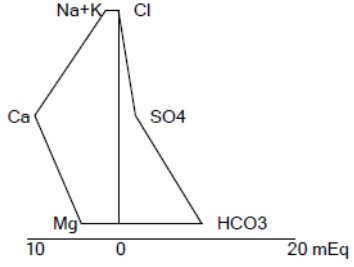

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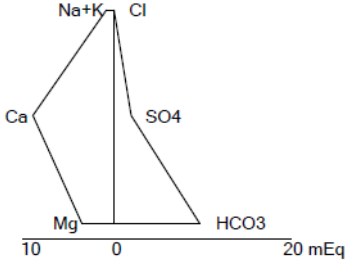

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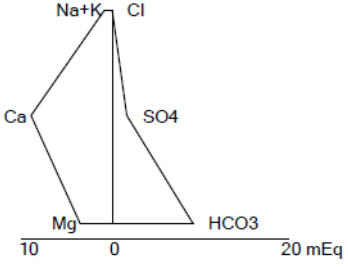


11/9/2018

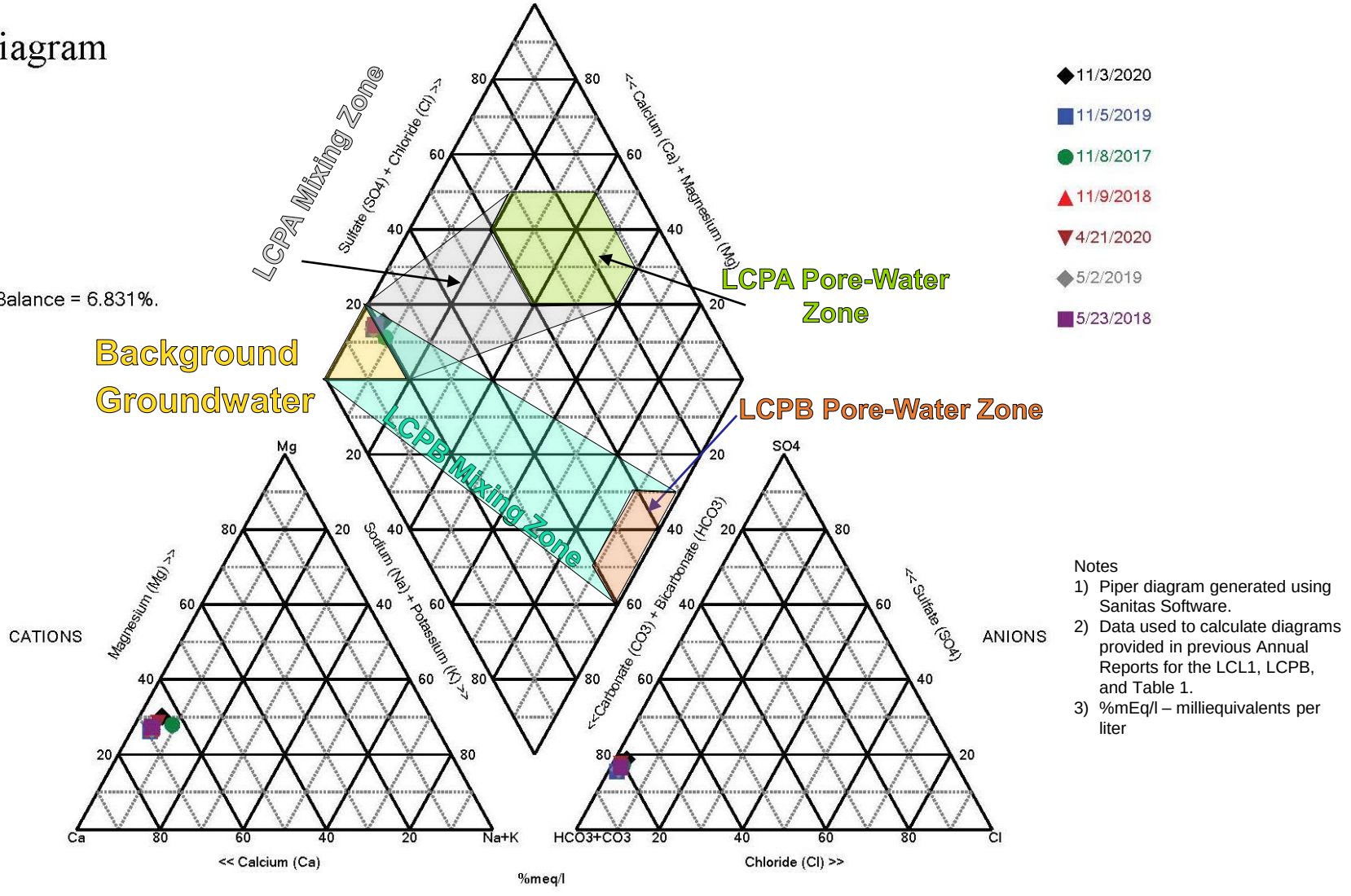
Notes
1) Stiff diagrams calculated using Sanitas Software.
2) Data used to calculate diagrams provided in previous Annual Reports for the LCL1, LCPB, and Table 1.
3) Na + K – Sodium plus Potassium.
4) SO4 – Sulfate.
5) HCO3 – Alkalinity.
6) Mg – Magnesium.
7) Ca – Calcium.
8) Cl – Chloride.
9) mEq – milliequivalents.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**TMW-2 Stiff Diagrams**		
DRAWN RJF	CHECKED EMS	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **3**

Piper Diagram

L-TMW-2

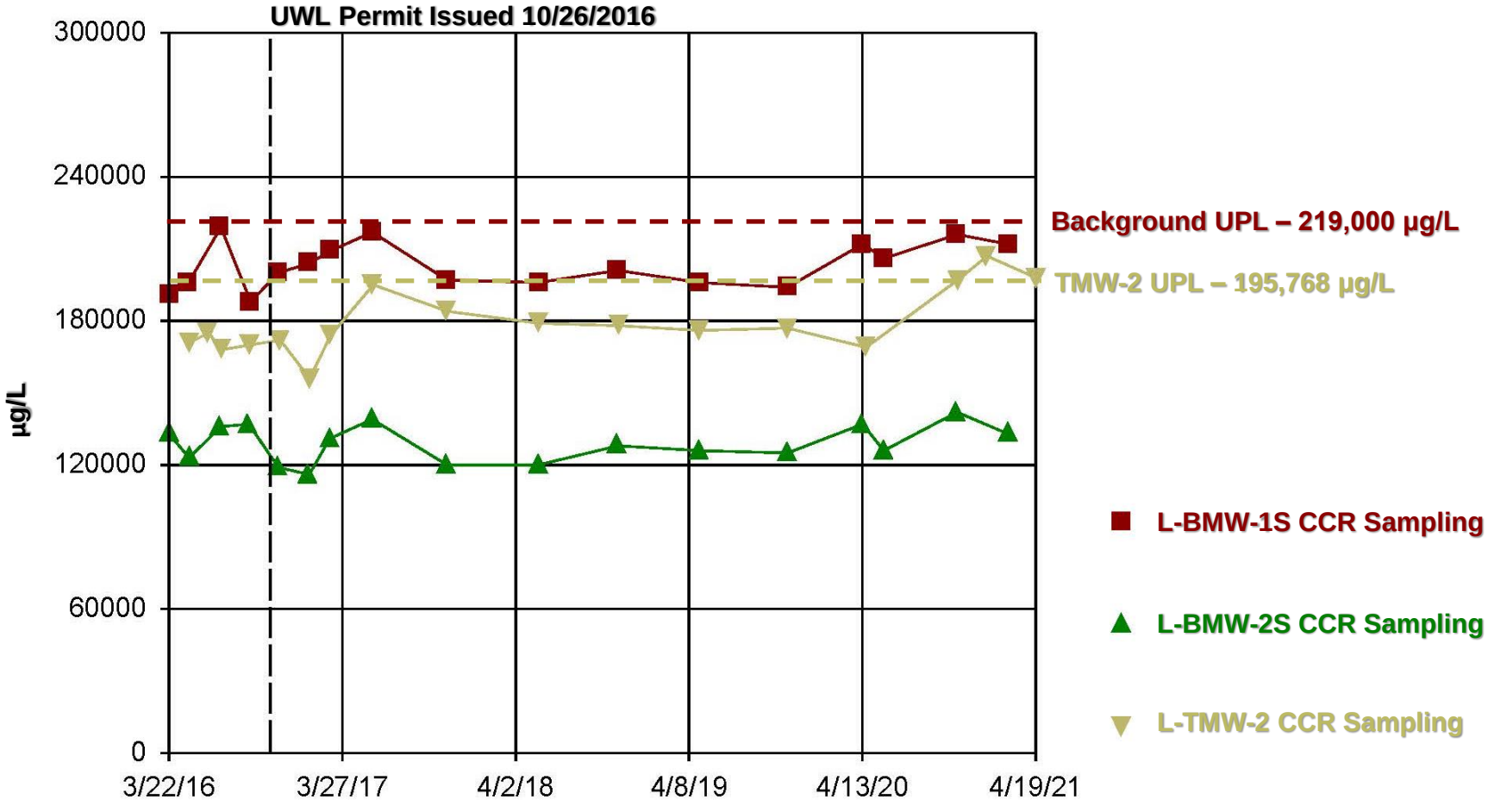
Cation-Anion Balance = 6.831%.



Notes

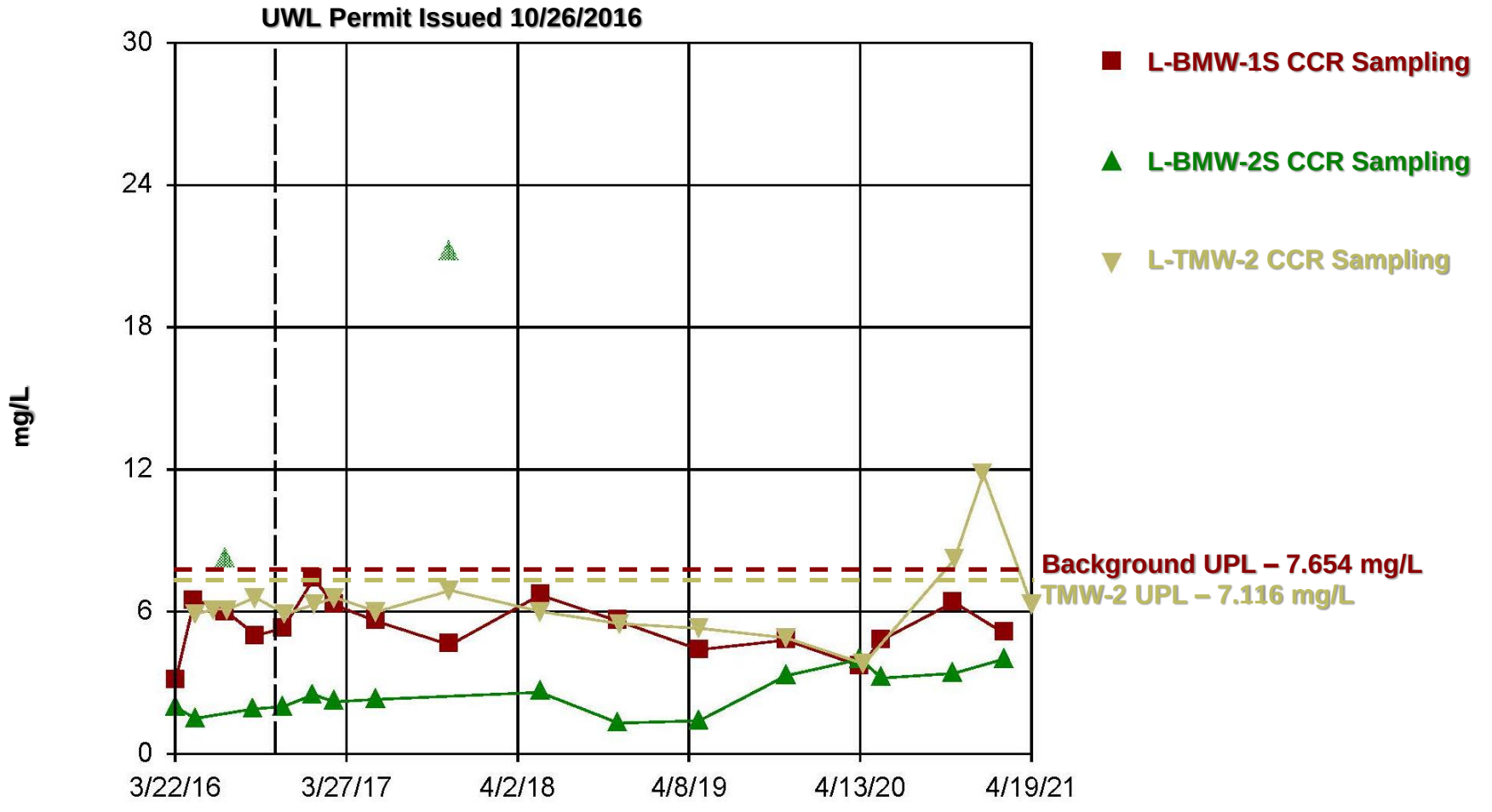
1) Piper diagram generated using Sanitas Software.
2) Data used to calculate diagrams provided in previous Annual Reports for the LCL1, LCPB, and Table 1.
3) %mEq/l – milliequivalents per liter

CLIENT/PROJECT					TITLE					
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER	**TMW-2 Piper Diagram**					
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **4**



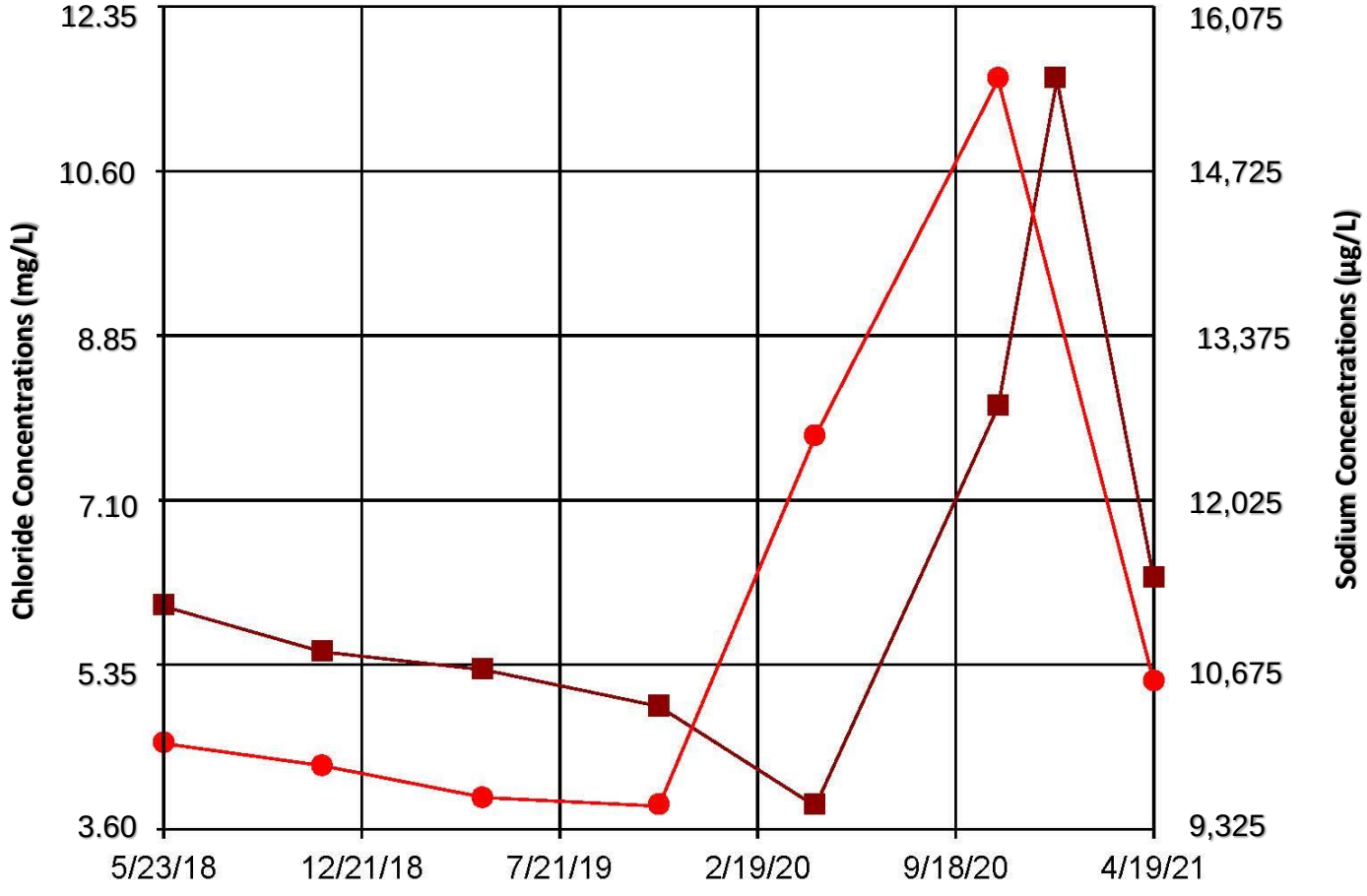
Notes
1) µg/L – Micrograms per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

CLIENT/PROJECT **AMEREN MISSOURI** **LABADIE ENERGY CENTER**						TITLE **Timeseries Plot of Calcium Concentrations at TMW-2**				
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **5**



Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

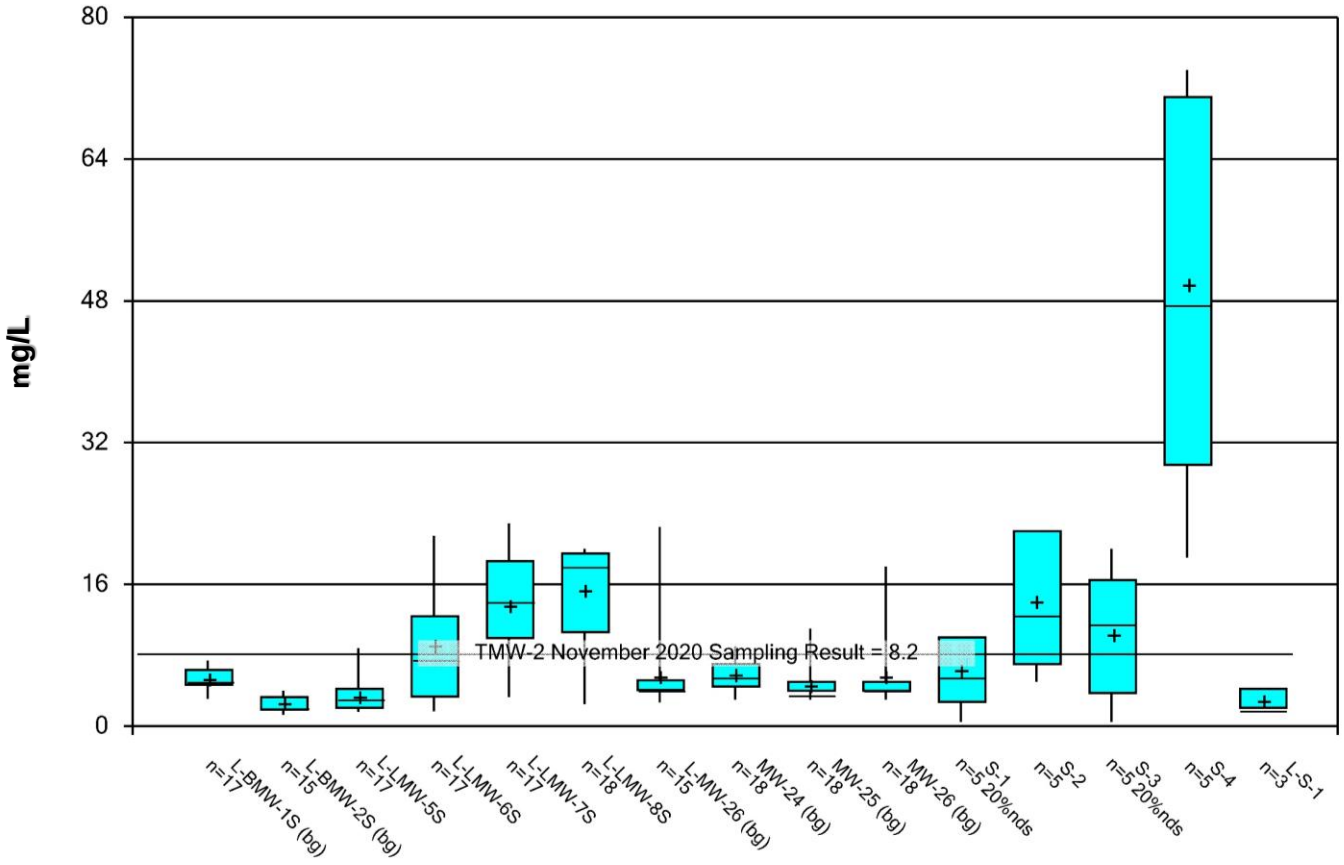
CLIENT/PROJECT							TITLE	
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Timeseries Plot of Chloride Concentrations at TMW-2**	
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
JSI	RJF	MNH	2021-06-02	N/A	N/A	153140603.0001	N/A	N/A	N/A	**6**



Notes
1) mg/L – Milligrams per liter.
2) µg/L – Micrograms per liter.

CLIENT/PROJECT **AMEREN MISSOURI** **LABADIE ENERGY CENTER**						TITLE **Timeseries Plot of Chloride and Sodium Concentrations at TMW-2**				
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **7**

Box & Whiskers Plot



Notes
1) mg/L – Milligrams per liter.

CLIENT/PROJECT							TITLE			
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Chloride Box and Whiskers Plot**			
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
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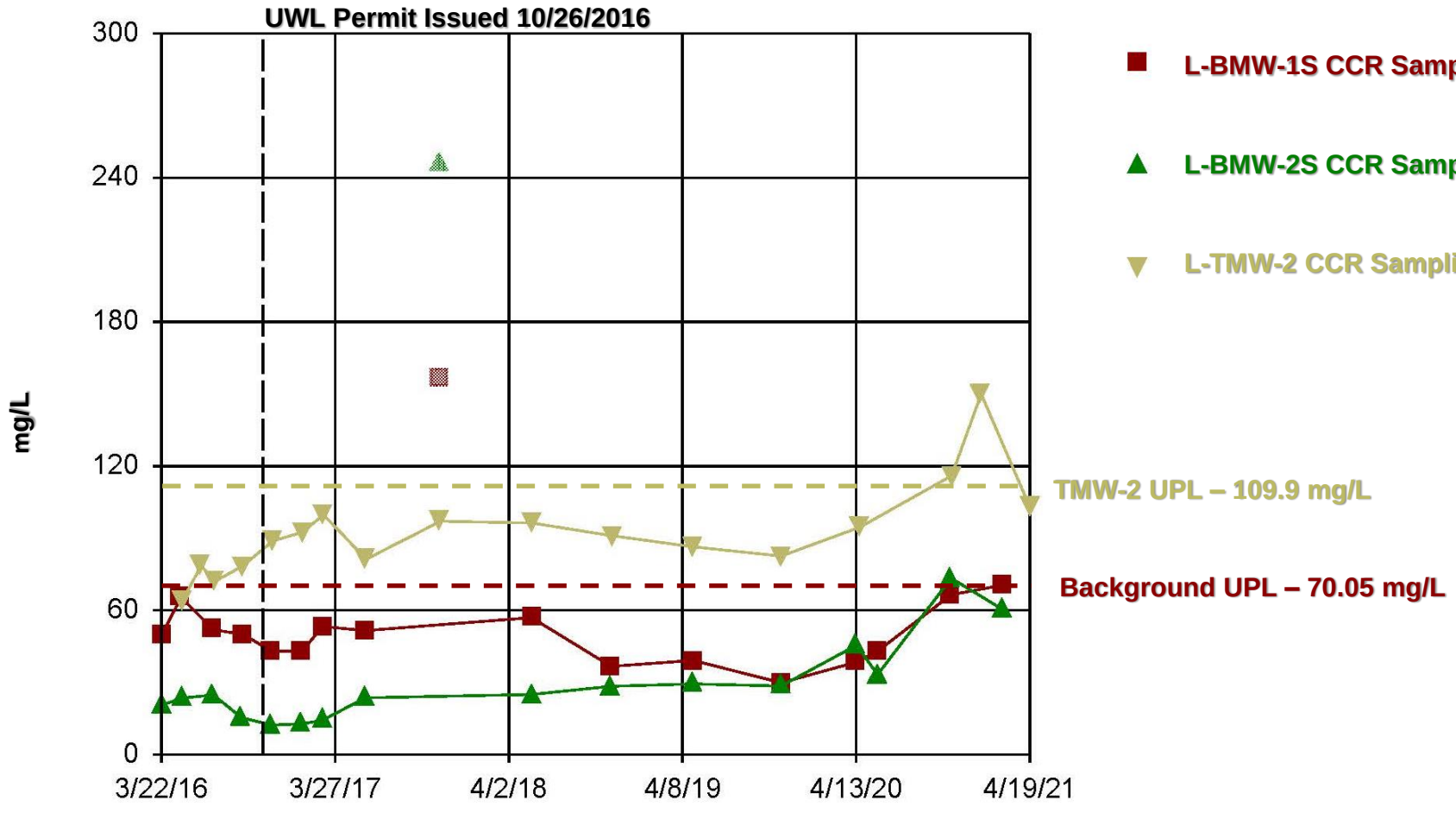
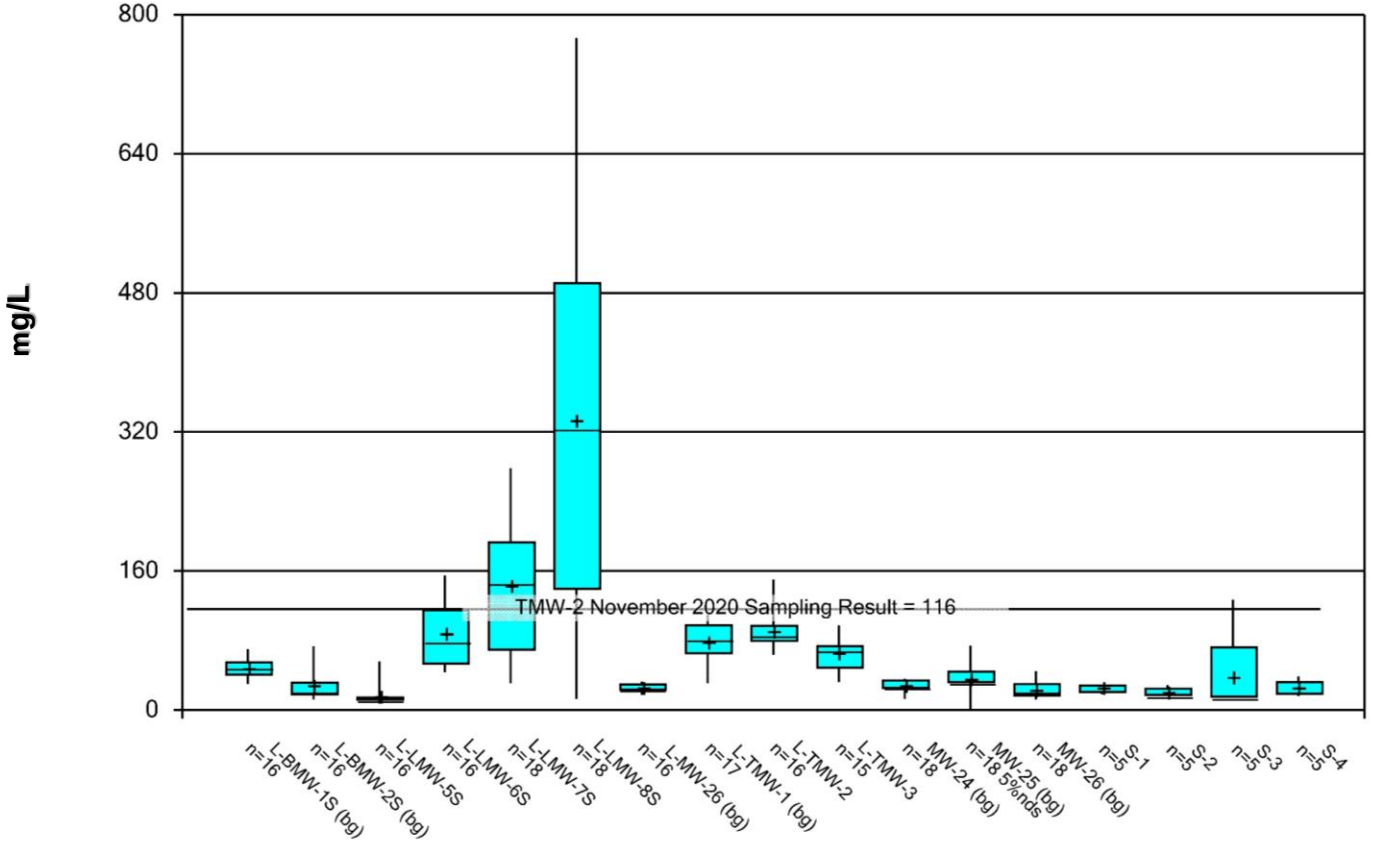


Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

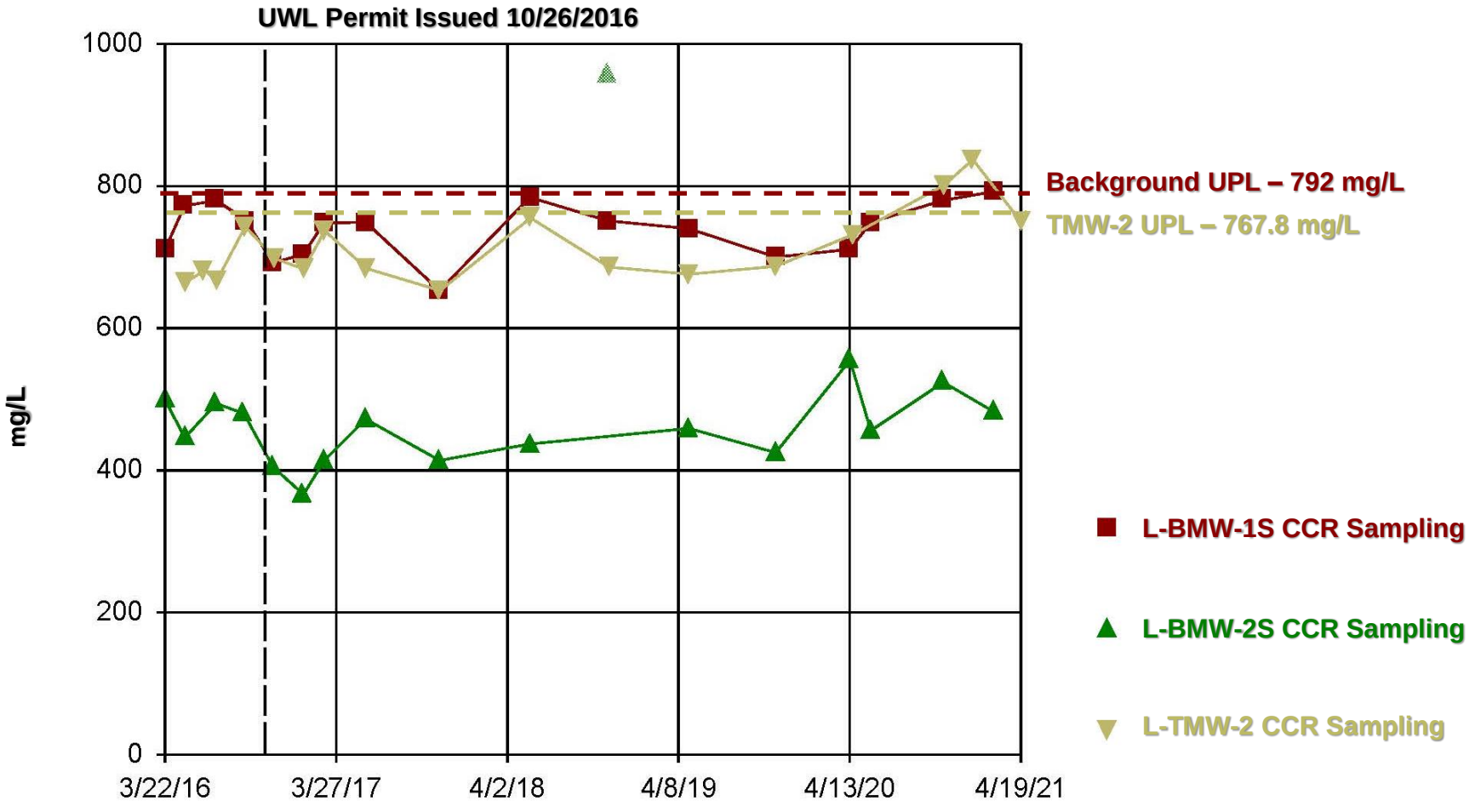
CLIENT/PROJECT						TITLE				
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER		**Timeseries Plot of Sulfate Concentrations at TMW-2**				
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **9**

Box & Whiskers Plot



Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

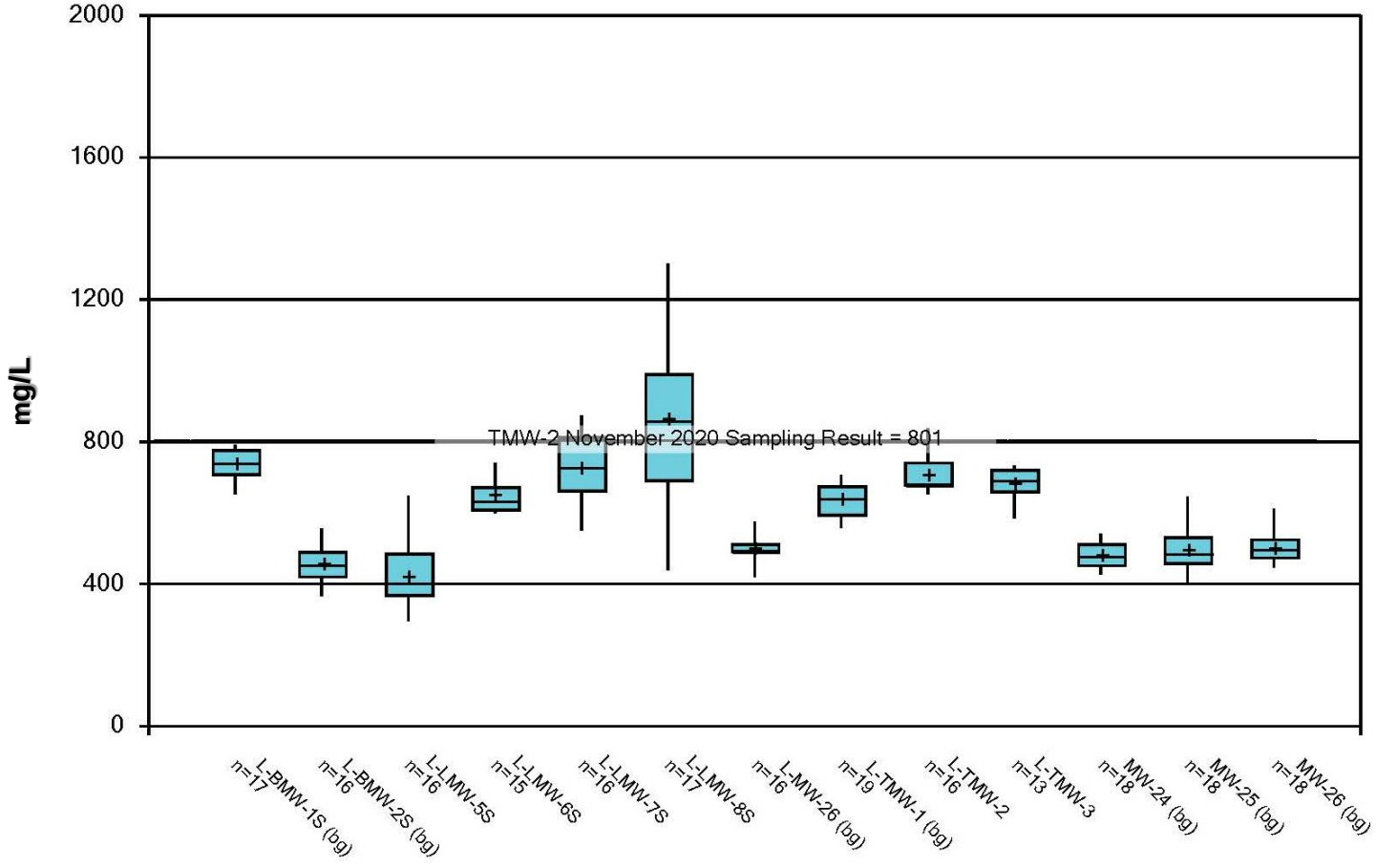
CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Sulfate Box and Whiskers Plot**		
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
JSI	RJF	MNH	2021-06-02	N/A	N/A	153140603.0001	N/A	N/A	N/A	**10**



Notes
1) mg/L – Milligrams per liter.
2) CCR – Coal Combustion Residuals.
3) UWL – Utility Waste Landfill.
4) UPL – Upper Prediction Limit.

CLIENT/PROJECT								TITLE	
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER				**Timeseries Plot of Total Dissolved Solids (TDS) Concentrations at TMW-2**	
DRAWN JSI	CHECKED RJF	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **11**

Box & Whiskers Plot



Notes
1) mg/L – milligrams per liter.

CLIENT/PROJECT						TITLE				
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER		**Total Dissolved Solids (TDS) Box and Whiskers Plot**				
DRAWN RJF	CHECKED EMS	REVIEWED MNH	DATE 2021-06-02	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **12**

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APPENDIX C

Alternative Source Demonstration - February - April 2021 Sampling Event

GOLDER
MEMBER OF WSP

REPORT

LCL1 - Alternative Source Demonstration

Labadie Energy Center, Franklin County, Missouri, USA

Submitted to:

Ameren Missouri

1901 Chouteau Avenue, St. Louis, MO 63103

Submitted by:

Golder Associates USA Inc.

13515 Barrett Parkway Drive, Suite 260, Ballwin, Missouri, USA 63021

+1 314 984-8800

153140603

November 29, 2021

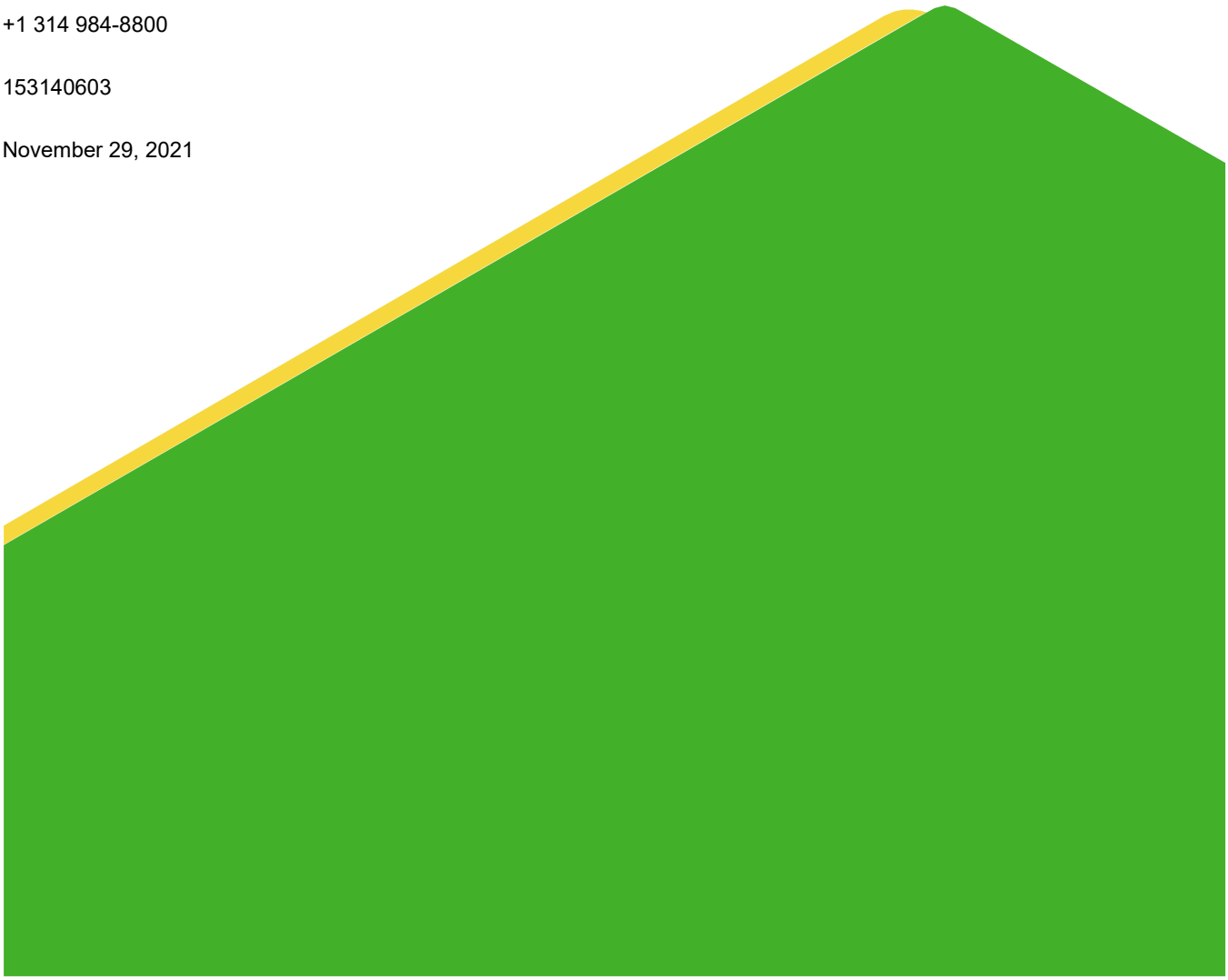

Table of Contents

TABLES

FIGURES

CERTIFICATION STATEMENT

This *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* has been prepared to comply with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule under the direction of a licensed professional engineer with Golder Associates Inc.

I hereby certify that this *LCL1 – Alternative Source Demonstration, Labadie Energy Center, Franklin County, Missouri, USA* located at 226 Labadie Power Plant Road, Labadie Missouri 63055 has been prepared to meet the requirements of 40 CFR §257.94(e)(2).

GOLDER ASSOCIATES USA INC.

_____

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

1.0 INTRODUCTION

In accordance with the United States Environmental Protection Agency (EPA) coal combustion residual (CCR) rule (CCR Rule or The Rule), this *LCL1 – Alternative Source Demonstration* has been prepared to document an Alternative Source Demonstration (ASD) for a Statistically Significant Increase (SSI) calculated at Ameren Missouri's (Ameren) Labadie Energy Center (LEC), Utility Waste Landfill (UWL) LCL1 or Cell 1. This document satisfies the requirements of §257.94(e)(2) which allows the owner or operator to demonstrate that a source other than the CCR Unit has caused an SSI and that the apparent SSI was the result of an alternative source or resulted from errors in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

2.0 SITE DESCRIPTION AND BACKGROUND

The LEC is located approximately 35 miles west of downtown St. Louis in Franklin County, Missouri, just south of the Missouri River. **Figure 1** depicts the site location and layout, including the location of LCL1. The LEC encompasses approximately 2,400 acres and is located within the Missouri River Valley. The facility is bounded to the north by the Missouri River, to the west by Labadie Creek, to the northeast and east by agricultural land, and to the south by a railroad line and bedrock bluffs.

2.1 Geological and Hydrogeological Setting

The site lies between the Missouri River (to the north) and bedrock bluffs (to the south). Flow and deposition from the Missouri River have resulted in thick alluvial deposits which lie on top of bedrock. These alluvial deposits, which can range from approximately 90 to 120 feet thick, comprise the uppermost aquifer. Overall, this alluvial aquifer is described as a fining-upwards sequence of stratified sands and gravels with varying amounts of silts and clays. Based on drilling records, the alluvial aquifer is divided into sub-units, including floodplain deposits, natural levee deposits, and channel deposits along with volumetrically less important loess deposits. Grain sizes of these alluvial deposits are variable.

Beneath the alluvial aquifer lies the bedrock aquifer. Bedrock in this region consists of Ordovician-aged rock. Formations include primarily limestone, dolomite, sandstone, and shale and are comprised of the Plattin Group, Joachim Dolomite, St. Peter Sandstone, Powell Dolomite, and the Cotter/Jefferson City Dolomites.

2.2 Utility Waste Landfill Cell 1 – LCL1

UWL Cell 1 is referred to by Ameren as the LCL1, or Cell 1. The LCL1 is approximately 31 acres in size and is located east of the generating plant (**Figure 1**). The CCR Unit manages CCR from the LEC and is permitted to accept fly ash waste, bottom ash waste, slag waste, and flue gas emission control waste generated primarily from the combustion of coal or other fossil fuels. Currently, the LCL1 is used for the disposal of dry disposal of fly ash and bottom ash from the LEC.

The LCL1 was constructed with a composite liner system consisting of two feet of compacted clay soil with a hydraulic conductivity of less than 1 X 10^{-7} centimeters per second (cm/sec) overlain by a 60-mil High Density Polyethylene (HDPE) geomembrane liner. Information on the design of the UWL is available in the 2013 Proposed Construction Permit application (Gredell and Reitz & Jens, 2013).

A groundwater monitoring well network was installed in 2013 and 2014 to permit the UWL construction. This monitoring well network was approved by the Missouri Department of Natural Resources (MDNR) and consists of 36 monitoring wells surrounding the current and future extents of the UWL (**Figure 1**). Most of these monitoring wells are installed in the uppermost portions of the alluvial aquifer, just below the seasonally low elevation for

groundwater. Three (3) monitoring wells (MW-33(D), MW-34(D), and MW-35(D)) are installed in the intermediate/deeper zones of the alluvial aquifer. Groundwater samples have been collected in most of these monitoring wells since April 2013 and tested for the MDNR UWL parameters. In April 2017, four (4) monitoring wells were installed and added to this network along Labadie Bottoms Road (S-1, S-2, S-3, and S-4).

The permit for the LCL1 was issued October 27, 2016 (permit #0907101). Eleven (11) sampling events were performed prior to October 27, 2016 at most of the state required UWL monitoring wells, and four (4) rounds of baseline CCR Rule sampling were completed at CCR Rule monitoring wells (discussed below). These results represent groundwater quality prior to CCR placement in the UWL. The results from these pre-disposal monitoring events are used in conjunction with other site information in the ASD presented below.

2.3 CCR Rule Groundwater Monitoring

As required by the CCR Rule, the following was completed prior to the October 17, 2017 deadline; (1) a groundwater monitoring well system was installed and certified by a Professional Engineer, (2) a Statistical Method Certification was prepared and certified by a Professional Engineer, (3) a Groundwater Monitoring Plan (GMP) was prepared recording the design, installation, development, sampling procedures, as well as statistical methods, and placed in the owner's operating record, and eight (8) baseline groundwater sampling events were completed for all Appendix III and Appendix IV parameters of CCR Rule.

The groundwater monitoring system for the LCL1 consists of six (6) monitoring wells screened in the uppermost aquifer (alluvial aquifer) as shown on **Figure 1**. Two (2) existing monitoring wells (MW-26 and TMW-1) were installed by Reitz & Jens, Inc. in 2013 as a part of the state UWL monitoring program. The remaining monitoring wells (TMW-2, TMW-3, BMW-1S, and BMW-2S) were installed by Golder in 2015 and 2016 for CCR Rule groundwater monitoring purposes. More information regarding the design and installation of the monitoring wells is provided in the LCL1 GMP (Golder, 2017) and the LCL1 2017 Annual Report (Golder, 2018).

Between May 2016 and June 2017, eight (8) baseline sampling events were completed for the LCL1. After baseline sampling, Detection Monitoring events have been completed twice a year generally once in Q2 and once in Q4. April 2021 was the last Detection Monitoring sampling event. Laboratory testing was performed for the following Appendix III constituents during each Detection Monitoring event:

- Boron
- Calcium
- Chloride
- pH
- Sulfate
- Total Dissolved Solids (TDS)
- Fluoride

Background results from the eight (8) baseline sampling events were used to calculate statistical upper prediction limits (UPL). These UPLs were then compared to the Detection Monitoring results. If result from the current Detection Monitoring event was higher than the calculated UPL, the result was considered an initial exceedance, and verification sample was performed in accordance with the LCL1 statistical analysis plan. Per the statistical

analysis plan, after the May 2019 sampling event, the UPLs were updated to incorporate results from four (4) of the Detection Monitoring events.

In November 2017, no exceedances were reported. In May 2018, four (4) initial exceedances were identified including boron, fluoride, and total dissolved solids (TDS) at TMW-1, as well as fluoride at TMW-2. Verification sampling results confirmed all four (4) SSIs. An ASD was prepared for the May 2018 results and is available in the 2018 LCL1 Annual Report; that ASD concluded that the SSIs observed for the May 2018 sampling event were not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2018, four (4) initial exceedances were identified for boron, chloride and fluoride at TMW-1 and fluoride at TMW-2, three (3) of which were the same at those reported during May 2018. Verification sampling results confirmed only the fluoride at TMW-1 result. An ASD was prepared for the November 2018 results and is available in the 2019 LCL1 Annual Report; the ASD also concluded that the confirmed SSI observed for November 2018 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In May 2019, seven (7) initial exceedances were identified for pH, calcium, chloride, and fluoride at various wells. Verification sampling results confirmed only chloride at TMW-1. An ASD was prepared for the May 2019 results and is available in the 2019 LCL1 Annual Report. This ASD also concluded that the confirmed SSI observed for May 2019 was not caused by the LCL1, but rather primarily the result of relatively low calculated UPLs that were not representative of the full, natural geochemical variability within the alluvial aquifer.

In November 2019, four (4) initial exceedances were identified for boron, chloride, and TDS at MW-26 and chloride at TMW-1. Verification sampling results only confirmed the three (3) SSIs at MW-26. An ASD was prepared for the November 2019 results and is available in the 2020 LCL1 Annual Report, which concluded that the SSIs observed in the November 2019 sampling event were not caused by the LCL1. The SSI observed for TDS at MW-26 was primarily caused by relatively low calculated UPLs that did not reflect the full, natural geochemical variability within the alluvial aquifer. The SSIs identified for boron and chloride in MW-26 were primarily caused by the LCL1 being downgradient from the LCPA, which is currently in corrective action. The LCPA, and not the LCL1, was identified as the source for the November 2019 SSIs.

In November 2020, six (6) initial exceedances were identified for calcium, chloride, fluoride, sulfate, and TDS at several wells. Verification sampling results only confirmed the four (4) SSIs at TMW-2. The SSI's at TMW-2 for calcium, chloride, sulfate, and TDS were caused by natural geochemical variability, and a lack of baseline data that does not reflect the temporal and spatial geochemical variability within the alluvial aquifer and not by the LCL1.

In April 2021, six (6) initial exceedances were identified for boron, calcium, chloride, fluoride, and TDS at several wells. Verification sampling results only confirmed the one (1) SSI for chloride at MW-26. Results from this sampling event are provided in **Table 1**.

3.0 REVIEW OF THE STATISTICALLY SIGNIFICANT INCREASES

The SSI for chloride occurred at monitoring well MW-26 and the values are provided on **Table 1**. MW-26 is screened in the upper portion of the alluvial aquifer just below the average seasonal low for groundwater. As shown on **Figure 1**, MW-26 is located to the west of the LCL1, which is east of the generating plant as well as

surface impoundments LCPA and LCPB. Closure of the LCPA was substantially completed before the April 2021 sampling event, with the completion of the liner cover system on December 30, 2020.

Based on Golder's review of the pre-disposal data discussed in Section 2.2 above, as well as our comparison of the pre-disposal data with the results from the eight (8) CCR-Rule baseline events, the groundwater at the LCL1 contains low-level, pre-existing CCR impacts from units/activities that pre-dated disposal activities in the LCL1. As a result of these pre-existing impacts, the LCL1 statistical analysis plan uses intrawell upper prediction limits (UPLs) to determine SSIs. Intrawell UPLs are calculated from historical data within a particular well, and not by pooling data from background wells, such that individual limits are calculated for each constituent in each well in the monitoring program.

4.0 EVIDENCE OF SSI FROM ALTERNATIVE SOURCE

Several different lines of evidence indicate that the SSI at MW-26 is not the result of a release from the LCL1, but is rather from an alternative source. The following bullets summarize the different lines of evidence that support this ASD:

- Pre-existing, low level concentrations of CCR indicators in groundwater that pre-date the installation and operation of LCL1.
- Construction of the LCL1 with a 60-mil geomembrane liner and a 2-foot thick clay barrier.
- Groundwater results from nearby and background monitoring wells.
- Prepartion of geochemical models displaying current and historical groundwater chemistries.

4.1 CCR indicators

Several types of CCR byproducts are generated by coal-fired power plants. The different types of CCR typically display distinct geochemical signatures and indicator parameters. **Table 2** below describes the different types of CCRs and their typical indicator parameters (USEPA 2018, EPRI 2011, EPRI 2012, and EPRI 2017).

Table 2: Types of CCR and Typical Indicator Parameters

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

Type of CCR	Description of CCR (USEPA 2018)	Key Indicators (EPRI 2011, 2012, 2017)
	sulfite or calcium sulfate or a dry powdered material that is a mixture of sulfites and sulfates.	■ Boron ■ Bromide ■ Chloride

Notes:

1) Fly ash and boiler slag/bottom ash typically have the same indicator parameters.
2) Definitions from USEPA website, available at https://www.epa.gov/coalash/coal-ash-basics.
3) Key indicators from EPRI 2011, 2012, and 2017 as well as Gredell and Reitz & Jens, 2014.

As described above, the LCL1 has historically received fly ash. No FGD type wastes are managed at the LEC.

4.2 Analysis of key indicator results at MW-26

4.2.1 Boron Concentrations

As indicated in **Table 2**, boron is a key indicator for fly ash and boiler slag/bottom ash impacts because it is typically present at relatively high concentrations in the leachate from these types of waste, is not a common anthropogenic contaminant, and is non-reactive and mobile in most hydrogeological environments (EPRI 2012). This non-reactive and mobile nature makes boron an early and key indicator of impacts from a CCR Unit. If groundwater was impacted by the LCL1, current boron concentrations should be statistically elevated with respect to pre-CCR placement downgradient of the LCL1.

Concentrations of boron at MW-26 as well as background wells BMW-1S and BMW-2S over the entire historical monitoring period are displayed in **Figure 2**. At MW-26, the current upper prediction limit (UPL) is the Double Quantification Rule (DQR)[1], and concentrations have ranged from ND to over 150 and high as 423 micrograms per liter (µg/L). The observed value of 423 µg/L in November 2019 has been evaluated in the November 2019 LCL1 ASD. As described in the ASD, the source of the elevated (423 µg/L) result was due to either sampling/testing error, temporary changes in flow direction due to Missouri River Flooding from May to August 2019, and/or due to preexisting CCR impacts from the upgradient LCPA and the downgradient flow of elevated concentrations to monitoring well MW-26. There are no current boron impacts on the downgradient side of the LCL1 in TMW-1, TMW-2, or TMW-3.

As displayed in **Figure 2**, current sampling results at MW-26 in April and June 2021 were 164 µg/L and 82.5 J µg/L, respectively. These values are similar or below those from the background wells BMW-1S and BMW-2S, located approximately 2.5-miles to the west of the LCL1. This suggests that elevated boron concentrations reported historically at MW-26 are likely the result of influence by the LCPA (or possibly sampling/testing error in the case of the 423 µg/L value) but are not currently observed at MW-26. These results demonstrate the temporal variability within the alluvial aquifer at the LCL1, and that the full variability, both naturally occurring within the aquifer, and from upgradient sources (LCPA) may exceed the current statistical UPL value.

[1] As further discussed in the Statistical Analysis Plan (SAP) for the LCL1, in situations where the entire background dataset is reported as ND or estimated (J-flag), the Double Quantification Rule (DQR) will be used to supplement the prediction limit analyses. Under the DQR, a SSI is triggered if a compliance well observation is higher than the reporting limit (RL)/PQL in either (1) both a detection monitoring sample and its verification resample, or (2) two consecutive sampling events in a program were resampling is not utilized.

4.2.2 Sulfate Concentrations

Like boron, sulfate is listed in **Table 2** as a key indicator for Fly Ash, Boiler Slag/Bottom Ash, and FGD type waste, and can be a key indicator of CCR impacts. Sulfate is mobile in most hydrogeological environments, except where conditions are strongly reducing. The groundwater around the LCL1 does not demonstrate strongly reducing conditions, which would include negative oxidation reduction potential (ORP) and hydrogen sulfide odors in the groundwater at the LCL1. If the SSI for chloride were caused by impacts from the LCL1, sulfate values would have been expected to increase following placement of CCR in the unit.

As displayed in **Figure 3**, sulfate concentrations at MW-26 during the April 2021 sampling event (24.1 milligrams per liter (mg/L)) were well below the UPLs for MW-26 (33.4 mg/L), the background wells (75.37 mg/L), and a UPL that was calculated using only historical data prior to the placement of CCR in the LCL1 (49.97 mg/L). As stated above, if the SSI for chloride were caused by impacts from the LCL1, sulfate values would be expected to be elevated relative to background levels and would be expected to increase following the placement of CCR in the LCL1. Because neither of these have been observed, it is likely that the SSI for chloride at MW-26 is from an alternative source and not the LCL1.

4.2.3 Molybdenum Concentrations

Table 2 lists molybdenum as a key indicator for fly ash and boiler slag/bottom ash impacts, because it is typically present at relatively high concentrations in the leachate from these types of waste and is not a common anthropogenic contaminant (EPRI 2012). Additionally, the upgradient LCPA is currently in corrective action due the presence of molybdenum at a statistically significant level (SSL), which demonstrates that CCR impacts from the LEC are likely to include increased molybdenum concentrations.

Figure 4 displays molybdenum results for MW-26, as well as BMW-1S and BMW-2S. As displayed, all sampling results for both MW-26 and the background wells are less than the PQL. The absence of molybdenum in MW-26 reveals that elevated concentrations for other constituents, such as chloride are likely related to an alternative source, rather than the LCL1.

4.2.4 Geochemical Analysis

Since November 2017, during Detection Monitoring events, major cation and anion concentrations have been tested. These data are used to compare major ion chemistry over time to see if the groundwater chemistry is changing, which is expected to be a key indicator if impacts are present from the LCL1.

4.2.4.1 Stiff Diagrams

Stiff diagrams visually display the major cation and anion data. **Figure 5** displays the Stiff diagrams from the April 2021 and previous Detection Monitoring events. Data from the April 2021 Detection Monitoring event and all the previous Detection Monitoring events display nearly identical distribution (i.e., the shape of the Stiff diagram is very consistent over time). If impacts from the LCL1 were causing the apparent SSIs, a shift in groundwater chemistry would be expected. **Figure 5** demonstrates that there has not been a shift in groundwater chemistry over time and thus the recent SSIs are not a result of influence from LCL1.

4.2.4.2 Piper Diagrams

A Piper diagram is a graphical technique used to classify and compare different groundwater chemistries. The same data used to generate the Stiff diagram were plotted on a ternary Piper diagram according to major cation and anion concentrations. In addition to showing instantaneous concentrations, Piper diagrams can be used to determine if groundwater chemistry is changing, either spatially or temporally. **Figure 6** displays a Piper diagram

for MW-26 over time. If CCR impacts from the LCL1 were causing the apparent SSIs, a shift in groundwater chemistry over time would be expected. **Figure 6** demonstrates that there has not been a shift in groundwater chemistry and thus the recent SSIs are not a result of influence from LCL1.

Additionally, a comparison of this diagram with those in the previous LCPB and LCL1 ASDs, found in the respective LCPB and LCL1 Annual Reports, (Golder, 2019a; Golder, 2019b; Golder, 2020b, Golder, 2020c) shows that groundwater chemistry in MW-26 plots in the area for background groundwater, further indicating a lack of impact from LCL1.

4.3 Evaluation of SSIs at MW-26

4.3.1 Chloride Concentrations

Chloride is not listed in **Table 2** as a typical indicator of fly ash or boiler slag/bottom ash (EPRI 2012, EPRI 2017) because it typically has low concentrations in CCR leachate relative to typical background. As discussed in the ASD for the November 2020 sampling event (Golder, 2021), chloride can be a CCR indicator if concentrations in the source are higher than background levels, which is the case for the LCPA. Chloride is typically a key indicator for FGD type wastes, and it can be a good indicator because chloride, like boron, has high mobility and low reactivity in most aquifer conditions. No FGD Wastes are managed at the LEC.

Concentrations for the April 2021 sampling event and subsequent June 2021 verification sampling event were 7.7 and 6.3 mg/L, respectively. The calculated UPL for MW-26 is 5.922 mg/L. Historically, based on CCR Rule sampling, chloride concentrations have ranged from 2.7 to 22.5 mg/L. Background monitoring wells located approximately 2.5-miles upgradient from the LCL1 have had chloride concentrations ranging from 1.3 to 7.4 mg/L (with outliers at 8.2 and 21.2 mg/L) and an UPL of 7.654 mg/L. As displayed in **Figure 7**, chloride results from April and June 2021 in MW-26 are within the range of historical background results.

Figure 7 displays chloride concentrations over the entire historical monitoring period at MW-26 as well as background monitoring wells BMW-1S and BMW-2S. Prior to the placement of CCR material in the LCL1, chloride concentrations in MW-26 ranged between 4.0 and 18.0 mg/L. Based on the review of these historical results, it is evident that fluctuations within the alluvial aquifer prior to the placement of CCR at the LCL1 resulted in higher concentrations than those currently observed in MW-26. Thus, the April 2021 SSI for chloride in MW-26 is likely not a result of the LCL1, but rather an alternative source.

This information, along with an apparent lack of elevated boron, sulfate, or molybdenum concentrations and the statistical consistency of the geochemical signature in MW-26, indicate that the recent SSI for chloride in MW-26 in April 2021 was not a result of a release from the LCL1, but instead is attributed to one of three potential sources, including: (1) geochemical variability in the alluvial aquifer, (2) a relatively small set of baseline data that do not reflect the full natural and temporal and spatial variability within the aquifer, and (3) pre-existing impacts from the LCPA. This further displays the temporal variability within the shallow zone of the alluvial aquifer and that elevated concentrations during the April 2021 sampling event are not from the LCL1.

5.0 DEMONSTRATION THAT SSI WAS NOT CAUSED BY LCL1 IMPACT

Based on the information presented in Section 4.0 above, the SSI reported for the April 2021 monitoring event at MW-26 is not a result of impacts from the LCL1. The SSI appears to be a result of numerous factors, including: (1) geochemical variability within the alluvial aquifer and (2) a relatively small set of baseline data that do not reflect the full natural, temporal, and spatial variability within the aquifer. Only twelve (12) samples have been used thus far to calculate the intrawell UPLs. It can take many years of data gathering to experience a range of variability

that is representative of natural conditions for any given aquifer. The results gathered thus far have apparently not captured the full extent of the natural spatial and temporal variability in the alluvial aquifer at the LEC.

Further, the verification sampling data for June 2021 also provide a strong indication that the SSI was likely a result of geochemical variability within the alluvial aquifer. The result for the June 2021 event is lower than that from April 2021 event, and just slightly elevated in relation to the UPL for chloride in MW-26. However, the chloride results for June 2021 in MW-26 was below the background UPL.

Finally, the construction of the LCL1, with 2-feet of compacted clay overlain by a 60-mil HDPE liner, also limits the potential that the April 2021 SSI reported for MW-26 is a result influence from LCL1. SSIs observed in MW-26 are not the result of impacts from the LCL1.

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Tables

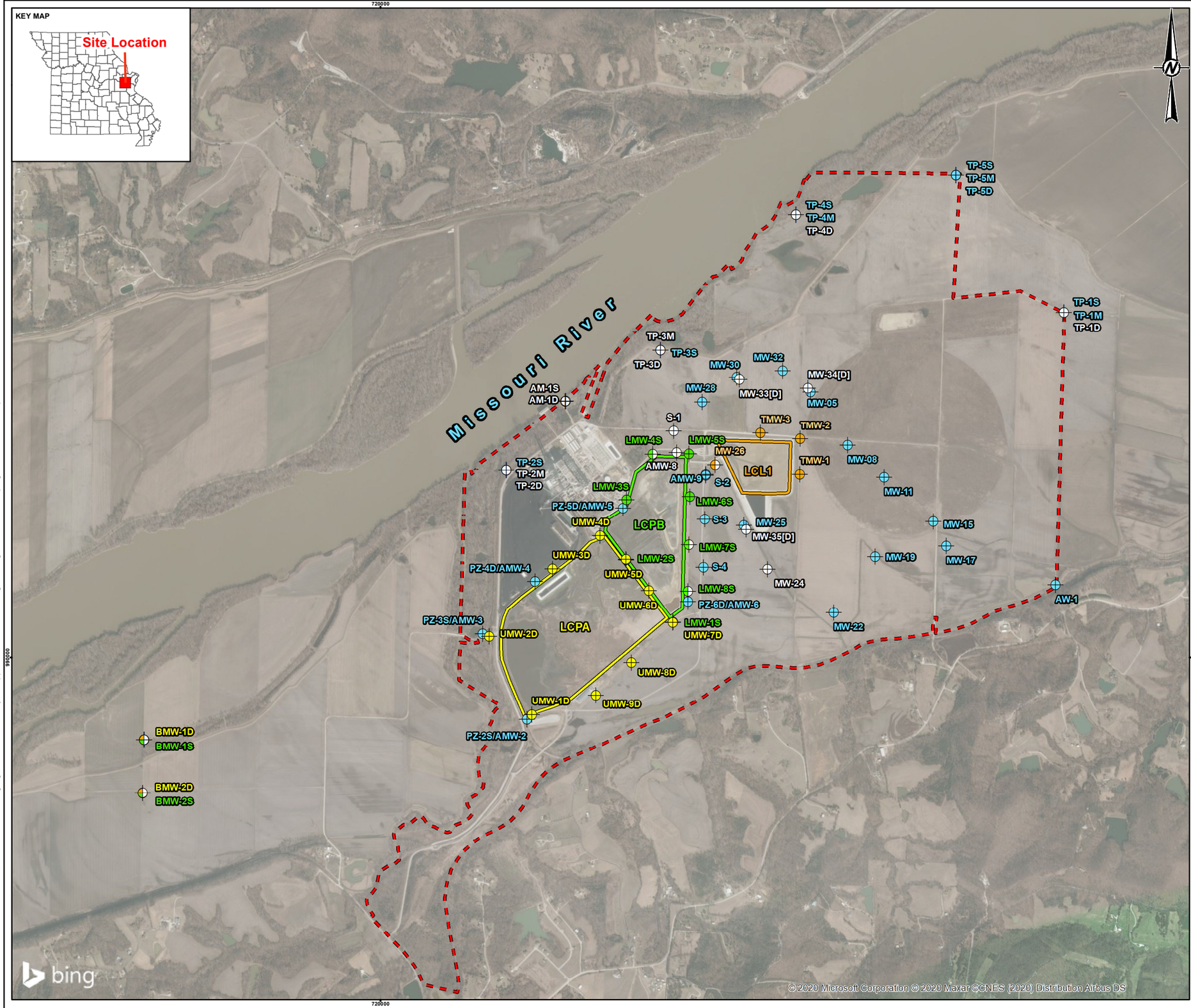
Table 1
February-April 2021 Detection Monitoring Results
LCL1 - Utility Waste Landfill Cell 1
Labadie Energy Center, Franklin County, MO

		BACKGROUND		GROUNDWATER MONITORING WELLS							
ANALYTE	UNITS	BMW-1S	BMW-2S	Prediction Limit MW-26	MW-26	Prediction Limit TMW-1	TMW-1	Prediction Limit TMW-2	TMW-2	Prediction Limit TMW-3	TMW-3
February - April 2021 Detection Monitoring Event											
DATE	NA	2/18/2021	2/18/2021	NA	4/16/2021	NA	4/19/2021	NA	4/19/2021	NA	4/19/2021
pH	SU	6.73	7.16	6.02-7.44	7.03	6.623-7.19	7.07	6.42-7.17	6.96	5.83-7.07	6.90
BORON, TOTAL	µg/L	97.3 J	42.0 J	DQR	164	139.7	108	136.3	98.3 J	139.7	120
CALCIUM, TOTAL	µg/L	212,000	133,000	182,000	138,000	177,907	176,000	195,768	198,000	208,416	177,000
CHLORIDE, TOTAL	mg/L	5.1	4.0	5.922	7.7	4.246	3.9 J	7.116	6.3	8.166	5.5
FLUORIDE, TOTAL	mg/L	ND	0.14 J	0.2237	0.29	0.2916	0.29	0.2707	ND	DQR	ND
SULFATE, TOTAL	mg/L	70.4	60.6	33.4	24.1	122.2	78.7	109.9	103	109.6	52.2
TOTAL DISSOLVED SOLIDS	mg/L	792	483	520.2	512	733.7	735	767.8	750	756.6	829
June 2021 Verification Sampling Event											
DATE	NA				6/7/2021		6/7/2021		6/7/2021		6/7/2021
pH	SU										
BORON, TOTAL	µg/L				82.5 J						
CALCIUM, TOTAL	µg/L								185,000		
CHLORIDE, TOTAL	mg/L				6.3 J						
FLUORIDE, TOTAL	mg/L				0.15 J						
SULFATE, TOTAL	mg/L										
TOTAL DISSOLVED SOLIDS	mg/L						630				596

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. NA - Not applicable.
4. ND - Constituent was analyzed but was not detected above the Method Detection Limit (MDL) or the adjusted Practical Quantitation Limit (PQL) based on data validation and is considered a non-detect. Values displayed as ND.
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.
9. If all background values are less than the Practical Quantitation Limit (PQL) then the Double Quantification Rule (DQR) is used.

Prepared By: JSI
Checked By: EMS
Reviewed By: SCP

Figures



LEGEND

Approximate Property Boundary

Labadie Energy Center CCR Units

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment
- LCL1 - Utility Waste Landfill Cell 1

Monitoring Well Network

- Corrective Action Monitoring Well
- LCPA Monitoring Well
- LCPB Monitoring Well
- LCPB and Corrective Action Monitoring Well
- LCL1 Monitoring Well
- LCL1 and Corrective Action Monitoring Well
- Background Well Used for LCPA, Corrective Action, LCPB, and LCL1 Monitoring
- Monitoring Well Used for Water Level Elevation Measurements Only

0 1,000 2,000 3,000 4,000

Feet

NOTE(S)

1.) ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.

REFERENCE(S)

1.) ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2.) COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
GROUNDWATER MONITORING PROGRAM

TITLE
LABADIE ENERGY CENTER GROUNDWATER MONITORING PROGRAMS AND MONITORING WELL LOCATION MAP

CONSULTANT
GOLDER

YYYY-MM-DD	2021-10-12
DESIGNED	JSI
PREPARED	BTT
REVIEWED	JSI
APPROVED	SCP

PROJECT NO.	CONTROL	REV.	FIGURE
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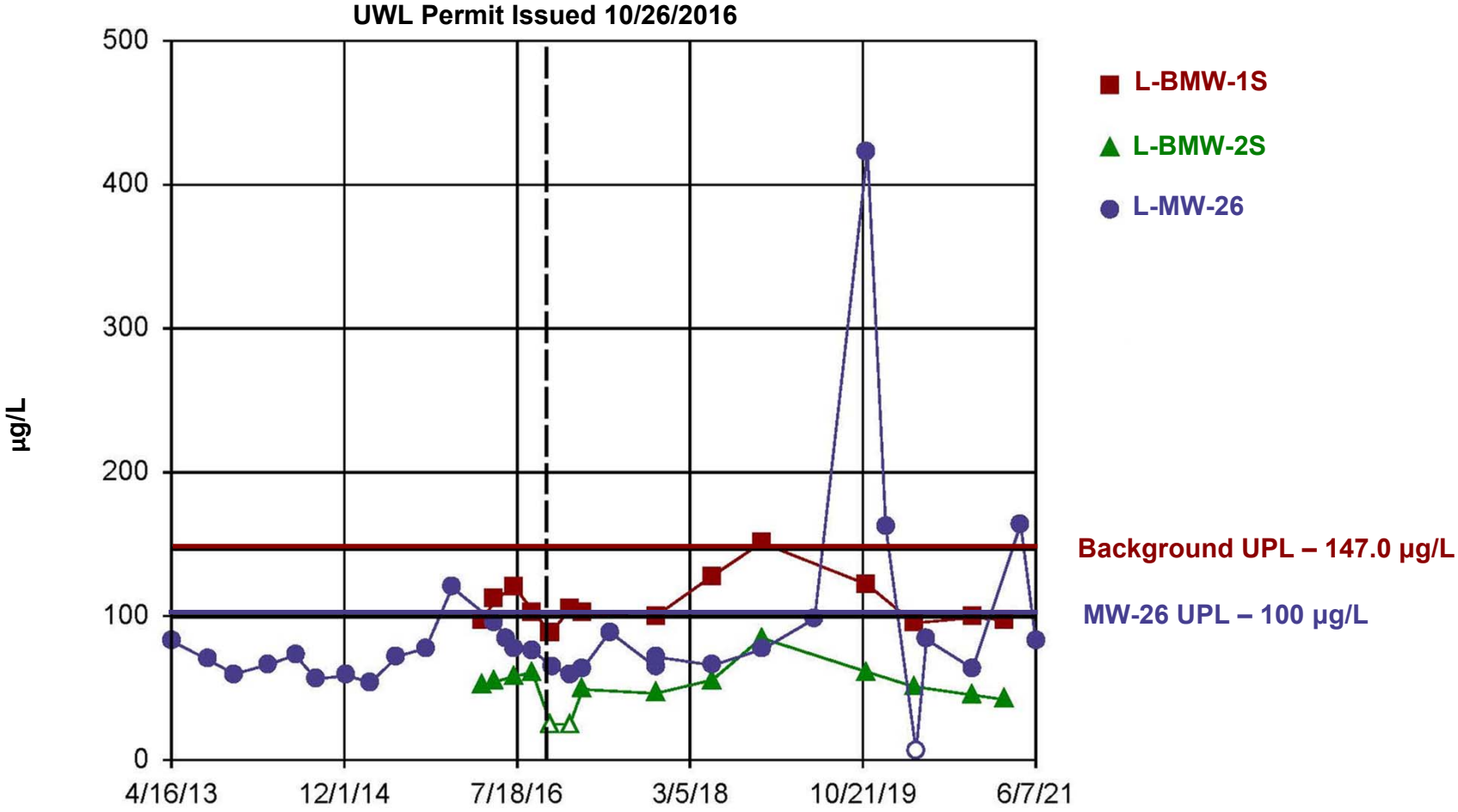
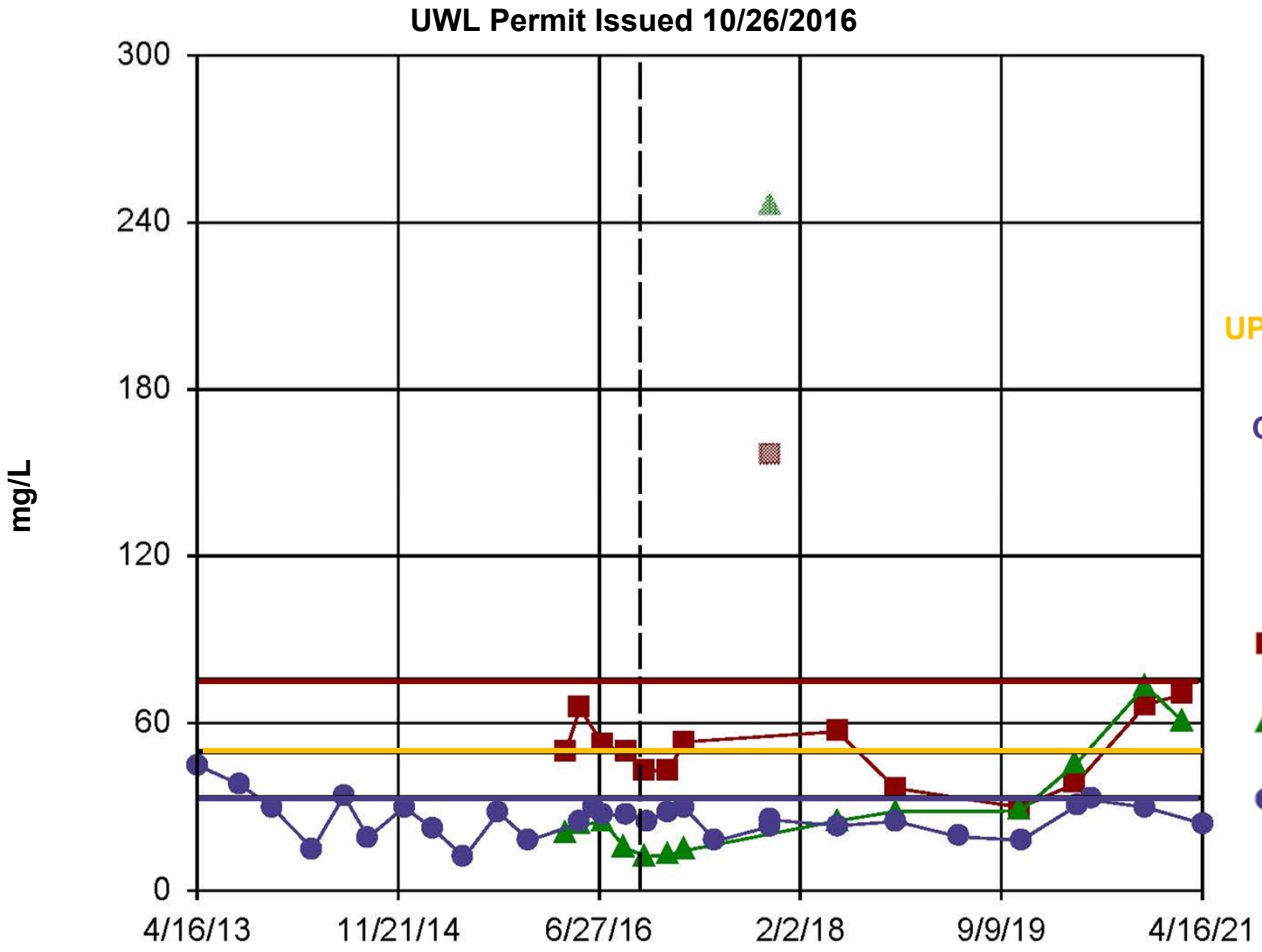


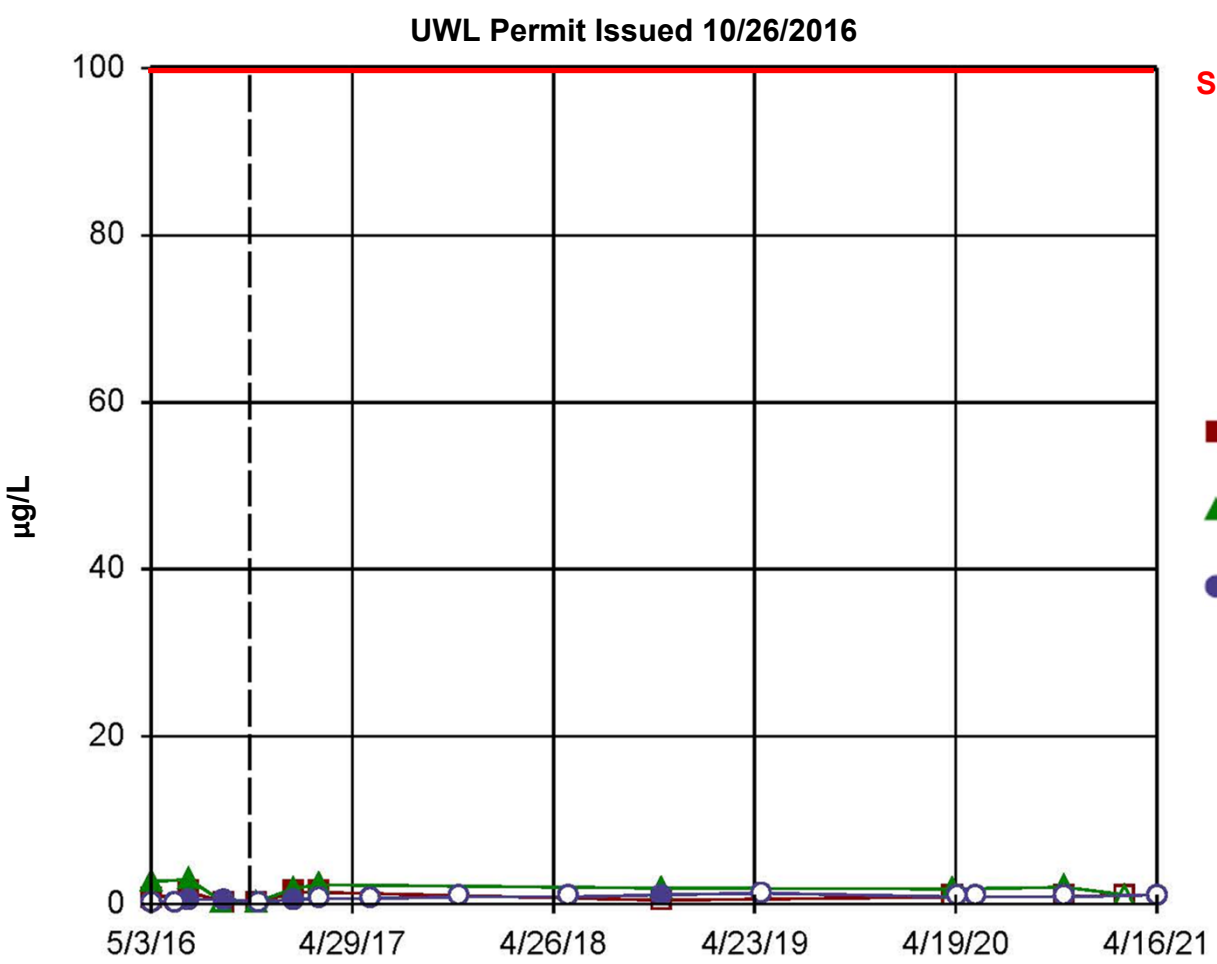
Notes
1) µg/L – Micrograms per liter.
2) UWL – Utility Waste Landfill.
3) UPL – Upper Prediction Limit.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Timeseries Plot of Boron Concentrations at MW-26**		
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
EMS	ANT	SCP	2021-11-01	N/A	N/A	153140603.0001	N/A	N/A	N/A	**2**



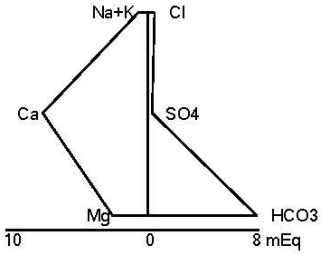
Notes
1) mg/L – Milligrams per liter.
2) UWL – Utility Waste Landfill.
3) UPL – Upper Prediction Limit.
4) Data points not connected to lines are considered outliers.

CLIENT/PROJECT							TITLE	
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Timeseries Plot of Sulfate Concentrations at MW-26**	
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
EMS	ANT	SCP	2021-11-01	N/A	N/A	153140603.0001	N/A	N/A	N/A	**3**



Notes
1) µg/L – Micrograms per liter.
2) UWL – Utility Waste Landfill.
3) UPL – Upper Prediction Limit.

CLIENT/PROJECT							TITLE		
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Timeseries Plot of Molybdenum Concentrations at MW-26**		
DRAWN EMS	CHECKED ANT	REVIEWED SCP	DATE 2021-11-01	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **4**



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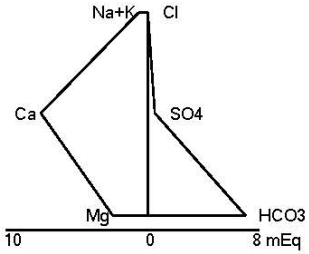
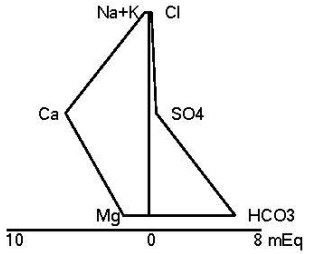


4/21/2020



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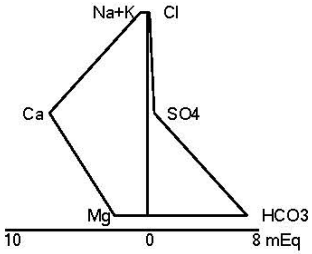

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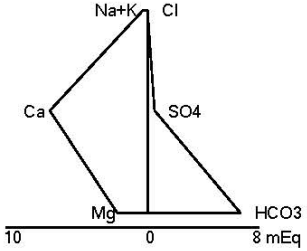

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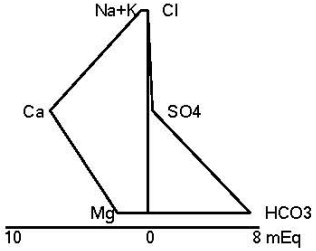

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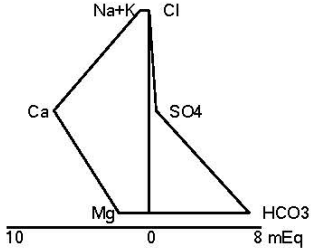

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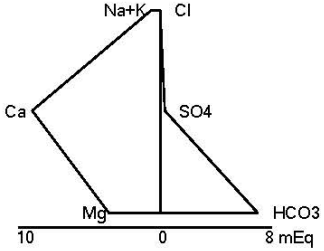
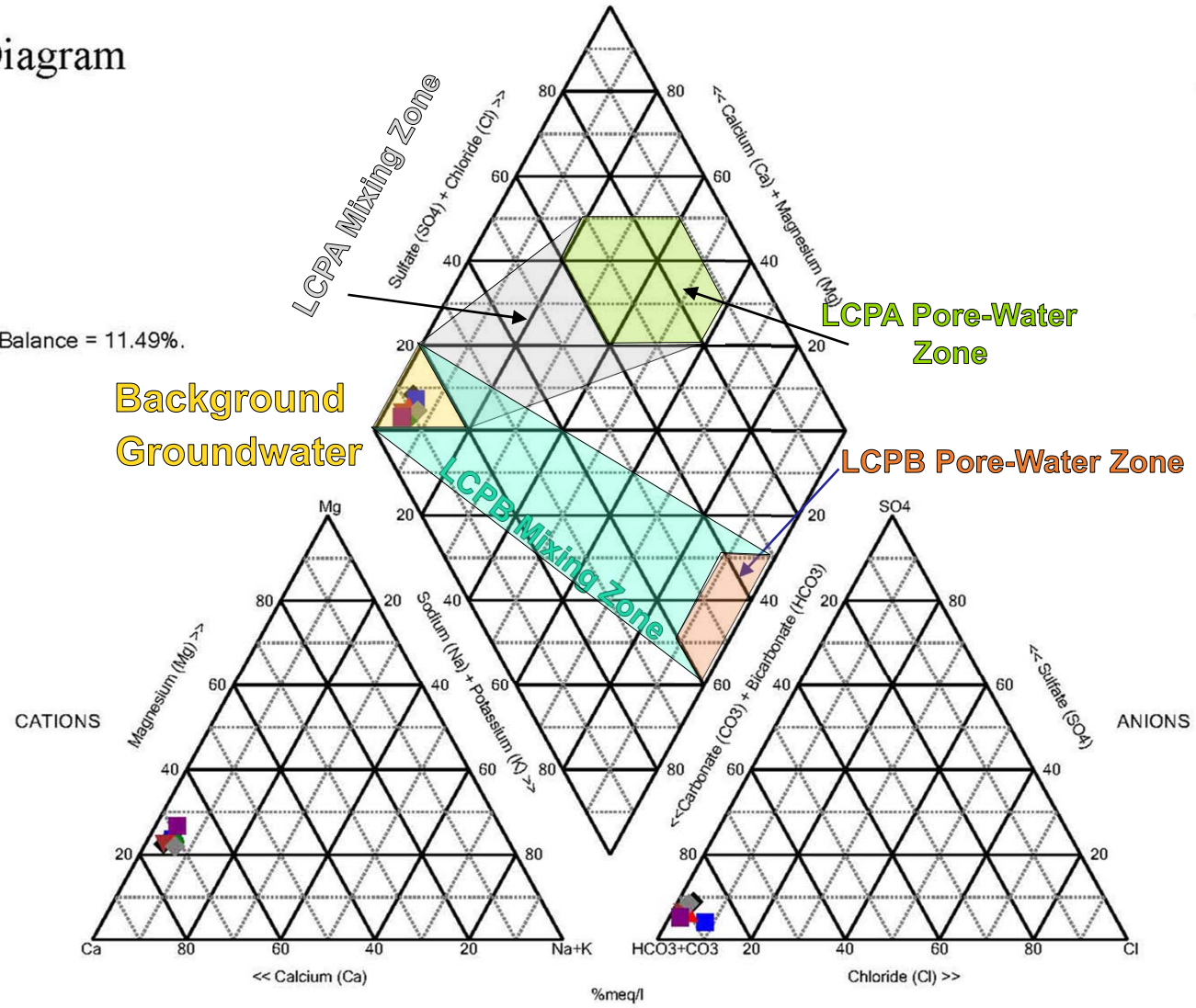


5/8/2019

Notes
1) Stiff diagrams calculated using Sanitas Software.
2) Data used to calculate diagrams provided in previous Annual Reports for the LCL1, LCPB, and Table 1.
3) Na + K – Sodium plus Potassium.
4) SO4 – Sulfate.
5) HCO3 – Alkalinity.
6) Mg – Magnesium.
7) Ca – Calcium.
8) Cl – Chloride.
9) mEq – milliequivalents.

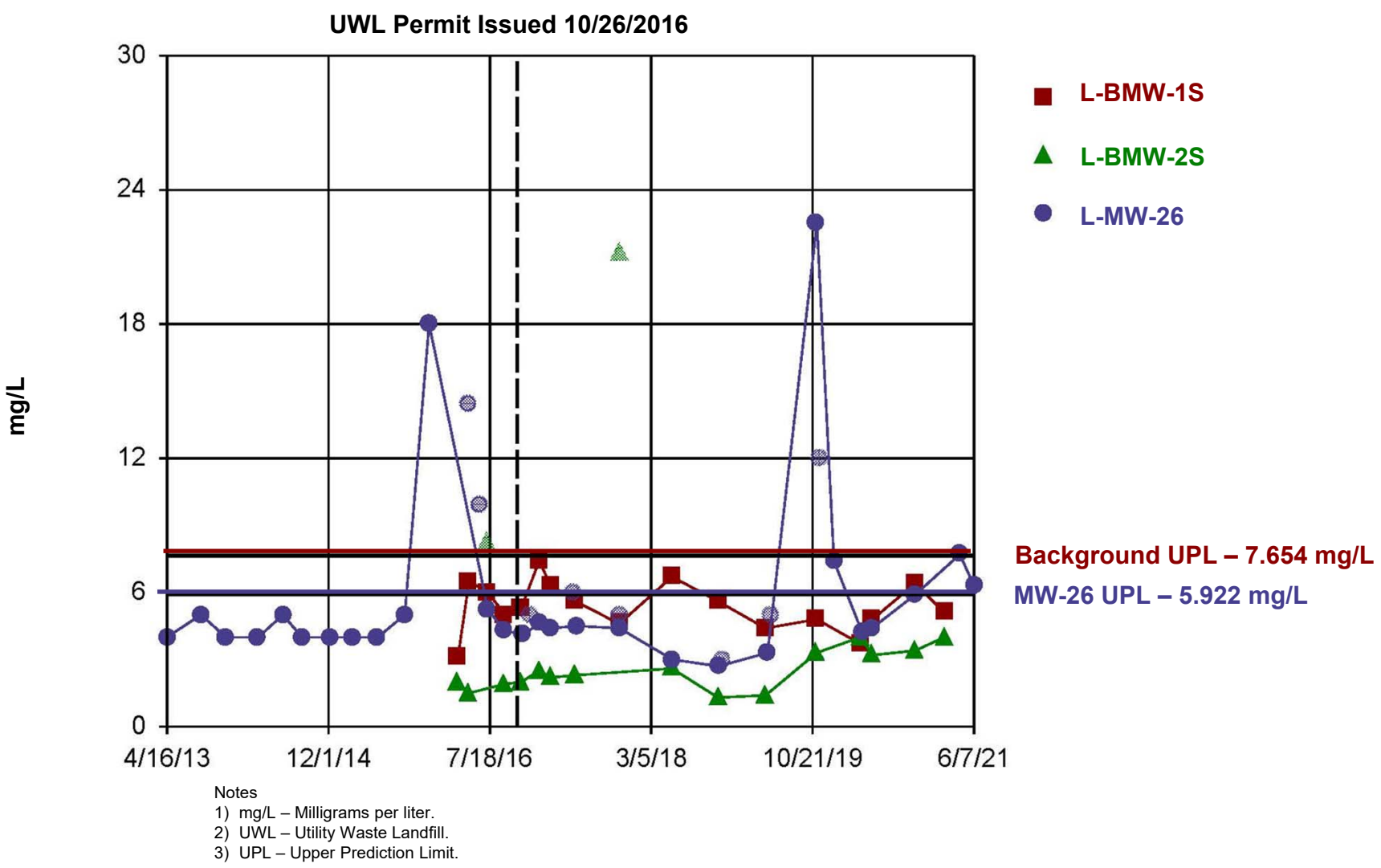
CLIENT/PROJECT							TITLE			
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**MW-26 Stiff Diagrams**			
DRAWN EMS	CHECKED ANT	REVIEWED SCP	DATE 2021-11-01	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **5**

Piper Diagram



Notes
1) Piper diagram generated using Sanitas Software.
2) Data used to calculate diagrams provided in previous Annual Reports for the LCL1, LCPB, and Table 1.
3) %mEq/l – milliequivalents per liter

CLIENT/PROJECT **AMEREN MISSOURI** **LABADIE ENERGY CENTER**				GOLDER			TITLE **MW-26 Piper Diagram**			
DRAWN EMS	CHECKED ANT	REVIEWED SCP	DATE 2021-11-01	SCALE N/A	FILE NO. N/A	JOB NO. 153140603.0001	DWG NO. N/A	SUBTITLE N/A	REV. NO. N/A	FIGURE **6**



Notes
1) mg/L – Milligrams per liter.
2) UWL – Utility Waste Landfill.
3) UPL – Upper Prediction Limit.

CLIENT/PROJECT							TITLE	
AMEREN MISSOURI **LABADIE ENERGY CENTER**				GOLDER			**Timeseries Plot of Chloride Concentrations at MW-26**	
DRAWN	CHECKED	REVIEWED	DATE	SCALE	FILE NO.	JOB NO.	DWG NO.	SUBTITLE	REV. NO.	FIGURE
EMS	ANT	SCP	2021-11-01	N/A	N/A	153140603.0001	N/A	N/A	N/A	**7**

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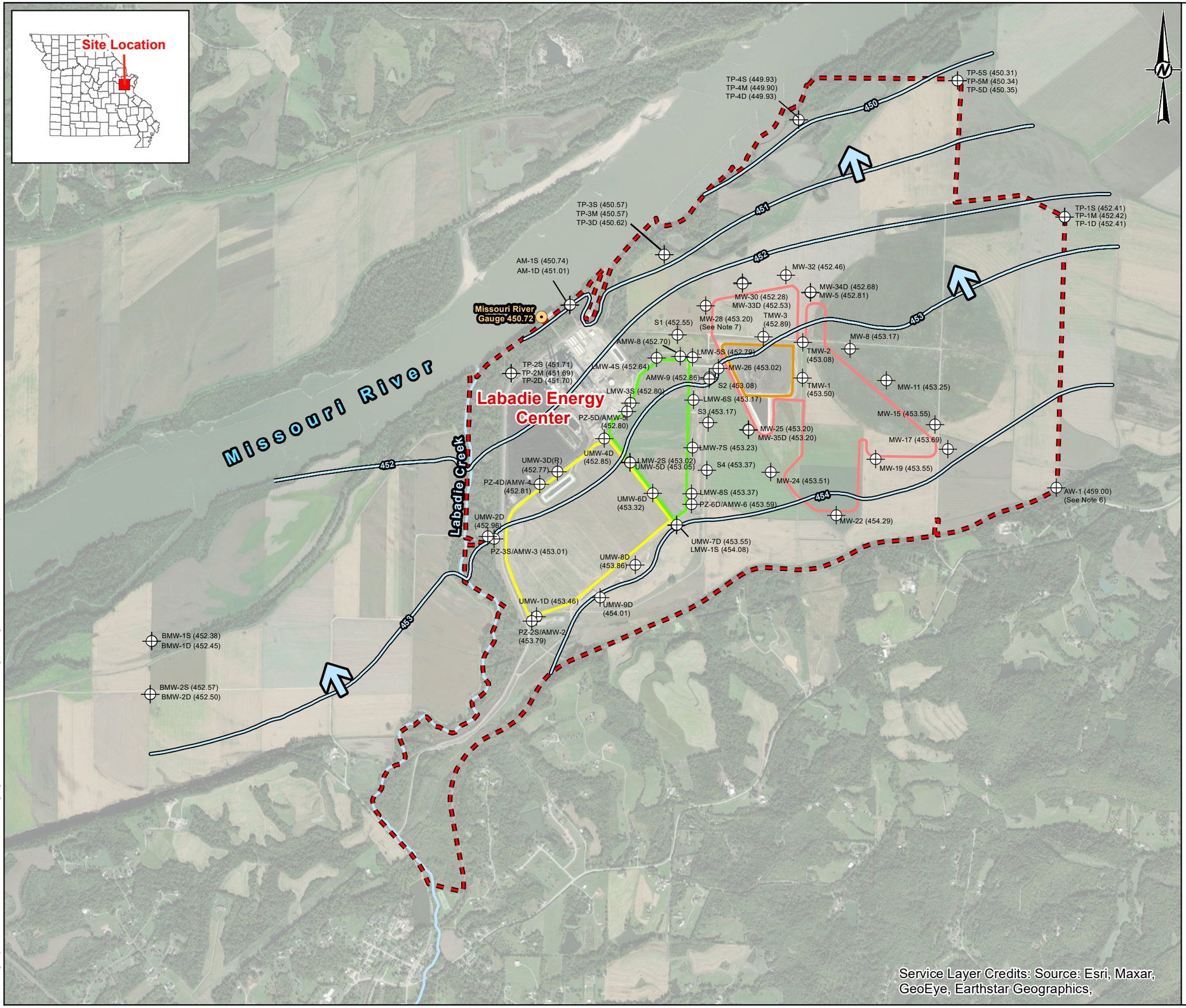
APPENDIX D

2021 Potentiometric Surface Maps



LEGEND

Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

Proposed Final UWL Fence Perimeter

LCL1 - Utility Waste Landfill Cell 1

Surface Impoundments

LCPA - Bottom Ash Surface Impoundment

LCPB - Fly Ash Surface Impoundment

Monitoring Well or Piezometer

Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

Missouri River Gauge

Groundwater Elevation Contours

Groundwater Elevation Contour (FT MSL)

Inferred Groundwater Elevation Contour (FT MSL)

Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
6. AW-1 WAS NOT USED IN POTENTIOMETRIC SURFACE CONTOURING.
7. MW-28 WAS NOT USED IN POTENTIOMETRIC SURFACE CONTOURING DUE TO MEASUREMENT ERROR.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000

Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JANUARY 4, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-01-27
PREPARED	BTT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153140603
PHASE 0001
FIGURE **D1**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM:
1 in
0

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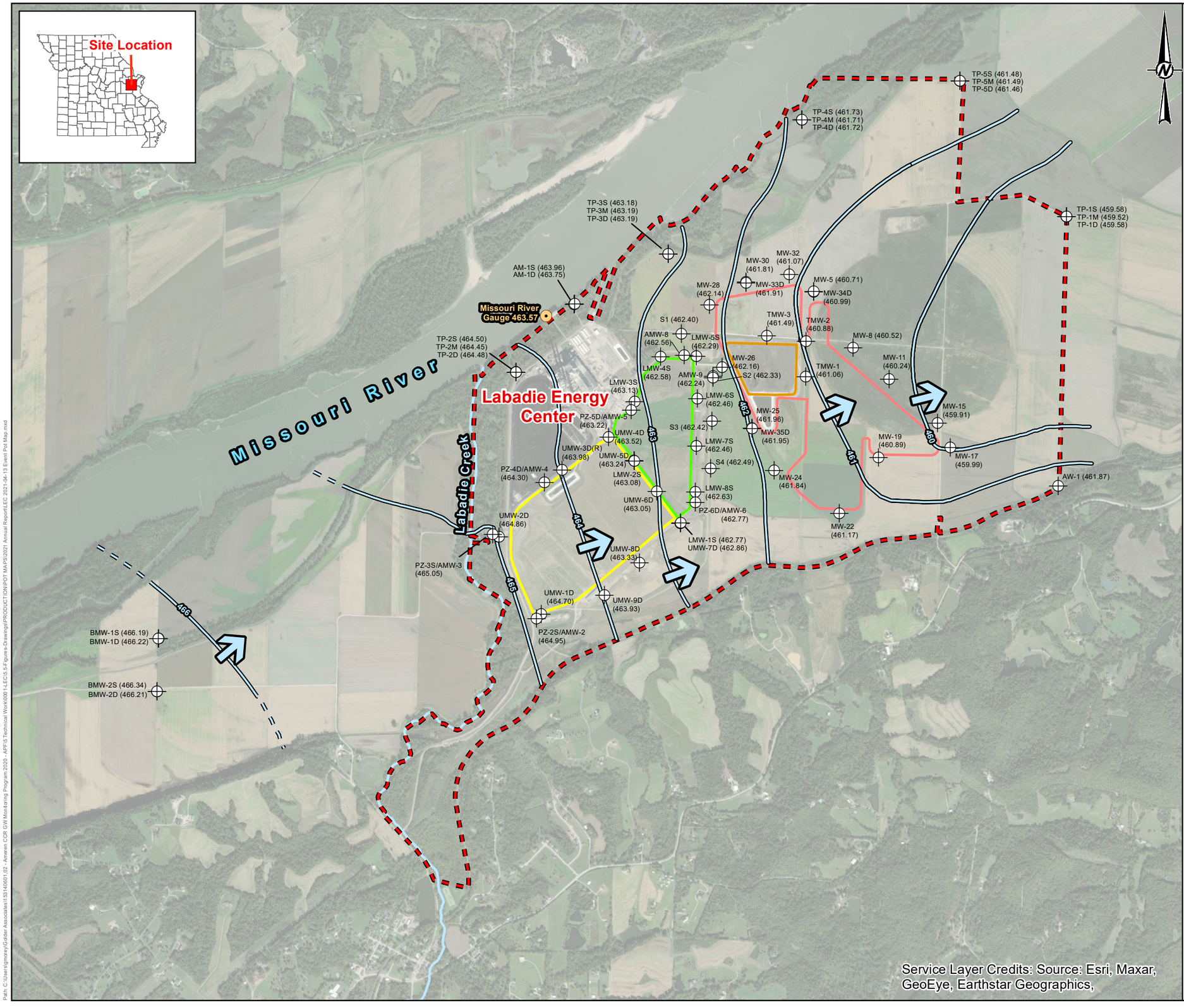

LEGEND

Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

Proposed Final UWL Fence Perimeter

LCL1 - Utility Waste Landfill Cell 1

Surface Impoundments

LCPA - Bottom Ash Surface Impoundment

LCPB - Fly Ash Surface Impoundment

Monitoring Well or Piezometer

Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

Missouri River Gauge

Groundwater Elevation Contours

Groundwater Elevation Contour (FT MSL)

Inferred Groundwater Elevation Contour (FT MSL)

Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000

Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
APRIL 15, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-05-14
PREPARED	BTT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153140603 | PHASE 0001 | FIGURE **D2**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 1in

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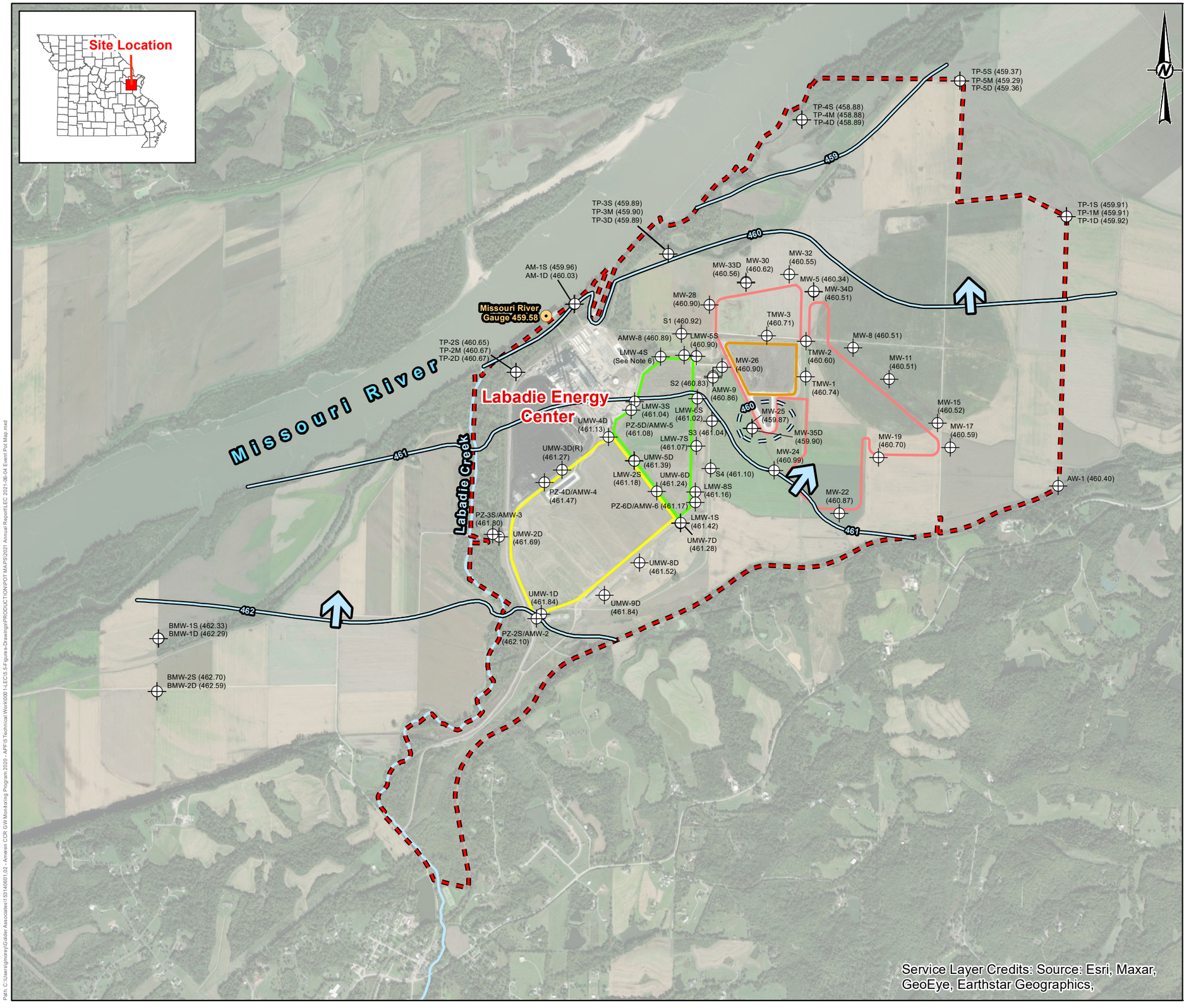

LEGEND

- Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

- Proposed Final UWL Fence Perimeter
- LCL1 - Utility Waste Landfill Cell 1

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
6. LMW-4S WAS NOT USED IN POTENTIOMETRIC SURFACE CONTOURING DUE TO MEASUREMENT ERROR.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000

Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
JUNE 4, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-09-03
PREPARED	ETF/BTT
DESIGN	JSI
REVIEW	EMS
APPROVED	MNH

PROJECT No. 153140603
PHASE 0001
FIGURE **D3**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 0 1in

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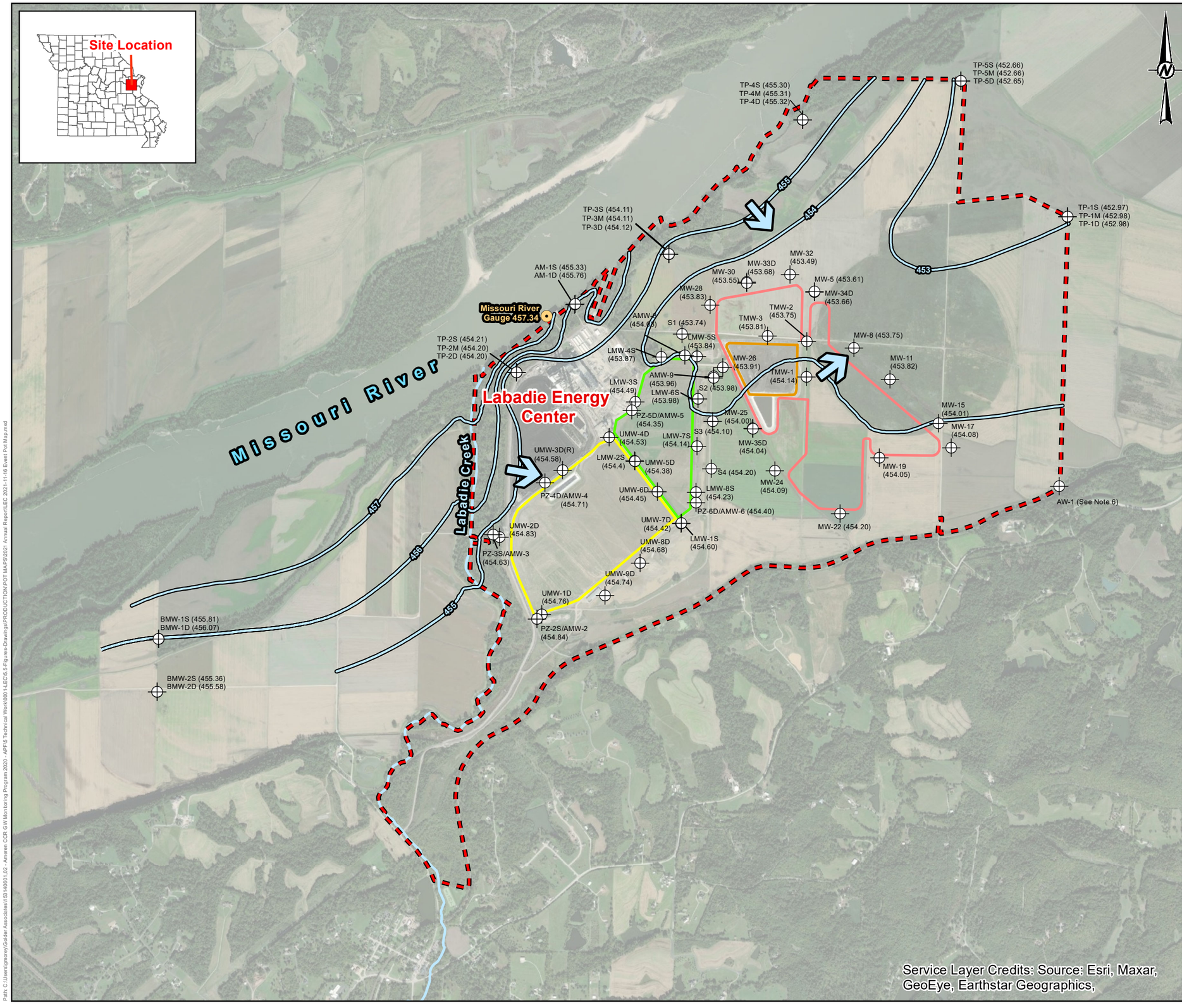

LEGEND

- Labadie Energy Center Property Boundary

Utility Waste Landfill (UWL)

- Proposed Final UWL Fence Perimeter
- LCL1 - Utility Waste Landfill Cell 1

Surface Impoundments

- LCPA - Bottom Ash Surface Impoundment
- LCPB - Fly Ash Surface Impoundment

Monitoring Well or Piezometer

- Monitoring Well or Piezometer

Surface Water Elevation Measurement Location

- Missouri River Gauge

Groundwater Elevation Contours

- Groundwater Elevation Contour (FT MSL)
- Inferred Groundwater Elevation Contour (FT MSL)
- Groundwater Flow Direction

NOTES

1. ALL LOCATIONS AND BOUNDARIES ARE APPROXIMATE.
2. GROUNDWATER ELEVATION MEASUREMENTS OBTAINED BY GOLDER.
3. GROUNDWATER ELEVATIONS DISPLAYED IN FT MSL (FEET ABOVE MEAN SEA LEVEL).
4. MISSOURI RIVER LEVEL OBTAINED FROM USGS LABADIE GAUGE 06935550.
5. THE UWL BOUNDARIES AND DESIGNATIONS ARE BASED ON AMEREN LABADIE CONSTRUCTION PERMIT APPLICATION DRAWINGS.
6. AW-1 WAS NOT USED IN POTENTIOMETRIC SURFACE CONTOURING.

REFERENCES

1. ZAHNER AND ASSOCIATES, INC. 2016. LOT CONSOLIDATION PLAT OF "LABADIE ENERGY CENTER" - PREPARED FOR AMEREN MISSOURI. REVISED JUNE 15, 2016.
2. COORDINATE SYSTEM: NAD 1983 STATEPLANE MISSOURI EAST FIPS 2,401 FEET.
3. USGS (UNITED STATES GEOLOGICAL SURVEY), NATIONAL WATER INFORMATION SYSTEM, USGS GAUGE 06935550 MISSOURI RIVER NEAR LABADIE, MO.

0 1,000 2,000 3,000 4,000 5,000 6,000

Feet

CLIENT
AMEREN MISSOURI
LABADIE ENERGY CENTER

PROJECT
CCR GROUNDWATER MONITORING PROGRAM

TITLE
NOVEMBER 1, 2021 POTENTIOMETRIC SURFACE MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-12-01
PREPARED	ETF
DESIGN	JSI
REVIEW	BTT
APPROVED	MNH

PROJECT No. 153140603
PHASE 0001
FIGURE **D4**

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: 1in 0

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