2020 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

UPPER AQC IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:
Evergy Metro, Inc.

SCS ENGINEERS

27217233.20 | January 2021

8575 W 110th Street, Suite 100
Overland Park, Kansas 66210
913-681-0030

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Professional Geologist in the State of Kansas, do hereby certify that the 2020 Annual Groundwater Monitoring and Corrective Action Report for the Upper AQC Impoundment at the La Cygne Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).

John R. Rockhold, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify that the 2020 Annual Groundwater Monitoring and Corrective Action Report for the Upper AQC Impoundment at the La Cygne Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).

Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions

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Appendices

1 INTRODUCTION

This 2020 Annual Groundwater Monitoring and Corrective Action Report was prepared to support compliance with the groundwater monitoring requirements of the "Coal Combustion Residuals (CCR) Final Rule" (Rule) published by the United States Environmental Protection Agency (USEPA) in the *Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule*, dated April 17, 2015 (USEPA, 2015), and subsequent revisions. Specifically, this report was prepared for Evergy Metro, Inc. (Evergy) to fulfill the requirements of 40 CFR 257.90 (e). The applicable sections of the Rule are provided below in *italics*, followed by applicable information relative to the 2020 Annual Groundwater Monitoring and Corrective Action Report for the Upper AQC Impoundment at the La Cygne Generating Station.

1.1 § 257.90(e)(6) SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

1.1.1 § 257.90(e)(6)(i) Initial Monitoring Program

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period, (January 1, 2020), the CCR Impoundment was operating under a detection monitoring program in compliance with § 257.94.

1.1.2 § 257.90(e)(6)(ii) Final Monitoring Program

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period, (December 31, 2020), the CCR Impoundment was operating under a detection monitoring program in compliance with § 257.94.

1.1.3 § 257.90(e)(6)(iii) Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to § 257.94(e):

(A) Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase; and

Monitoring Event	Monitoring Well	Constituent	ASD
Fall 2019	MW-706	Sulfate	Successful
Spring 2020	MW-704	Chloride	Successful
Spring 2020	MW-706	Sulfate	Successful
Spring 2020	TW-1	Sulfate	Successful

(B) Provide the date when the assessment monitoring program was initiated for the CCR unit.

Not applicable because an assessment monitoring program was not initiated.

1.1.4 § 257.90(e)(6)(iv) Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to § 257.95(g) include all of the following:

(A) Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase;

Not applicable because there was no assessment monitoring conducted.

(B) Provide the date when the assessment of corrective measures was initiated for the CCR unit;

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

(C) Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit*; and*

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

(D) Provide the date when the assessment of corrective measures was completed for the CCR unit.

Not applicable because there was no assessment of corrective measures initiated for the CCR Unit.

1.1.5 § 257.90(e)(6)(v) Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

Not applicable because corrective measures are not required.

1.1.6 § 257.90(e)(6)(vi) Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

Not applicable because corrective measures are not required.

2 § 257.90(E) ANNUAL REPORT REQUIREMENTS

Annual groundwater monitoring and corrective action report. *For existing CCR landfills and existing CCR surface impoundments, no later than January 31, 2018, and annually thereafter, the owner or operator must prepare an annual groundwater monitoring and corrective action*

report. For new CCR landfills, new CCR surface impoundments, and all lateral expansions of CCR units, the owner or operator must prepare the initial annual groundwater monitoring and corrective action report no later than January 31 of the year following the calendar year a groundwater monitoring system has been established for such CCR unit as required by this subpart, and annually thereafter. For the preceding calendar year, the annual report must document the status of the groundwater monitoring and corrective action program for the CCR unit, summarize key actions completed, describe any problems encountered, discuss actions to resolve the problems, and project key activities for the upcoming year. For purposes of this section, the owner or operator has prepared the annual report when the report is placed in the facility's operating record as required by § 257.105(h)(1). At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.1 § 257.90(E)(1) SITE MAP

A map, aerial image, or diagram showing the CCR unit and all background (or upgradient) and downgradient monitoring wells, to include the well identification numbers, that are part of the groundwater monitoring program for the CCR unit;

A site map with an aerial image showing the Upper AQC Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Upper AQC Impoundment groundwater monitoring program is provided as **Figure 1** in **Appendix A**.

2.2 § 257.90(E)(2) MONITORING SYSTEM CHANGES

Identification of any monitoring wells that were installed or decommissioned during the preceding year, along with a narrative description of why those actions were taken;

No new monitoring wells were installed and no wells were decommissioned as part of the CCR groundwater monitoring program for the Upper AQC Impoundment in 2020.

2.3 § 257.90(E)(3) SUMMARY OF SAMPLING EVENTS

In addition to all the monitoring data obtained under §§ 257.90 through 257.98, a summary including the number of groundwater samples that were collected for analysis for each background and downgradient well, the dates the samples were collected, and whether the sample was required by the detection monitoring or assessment monitoring programs;

Only detection monitoring was required to be conducted during the reporting period (2020). Samples collected in 2020 were collected and analyzed for Appendix III detection monitoring constituents. Additionally, Appendix IV constituents were analyzed with the spring event for potential future updating of background data in conformance with EPA Unified Guidance and industry standards. Results of the sampling events are provided in **Appendix B**, **Table 1** (Appendix III Detection Monitoring Results and Appendix IV Results), and **Table 2** (Detection Monitoring Field Measurements). These tables include Fall 2019 semiannual detection monitoring event verification sample data collected and analyzed in 2020; Spring 2020 semiannual detection monitoring data, verification sample data, and supplementary Appendix IV sample data; and, the initial Fall 2020 semiannual detection monitoring data. The dates of sample collection and the monitoring program requiring the sample are also provided in these tables.

2.4 § 257.90(E)(4) MONITORING TRANSITION NARRATIVE

A narrative discussion of any transition between monitoring programs (e.g., the date and circumstances for transitioning from detection monitoring to assessment monitoring in addition to identifying the constituent(s) detected at a statistically significant increase over background levels); and

There was no transition between monitoring programs in 2020. Only detection monitoring was conducted in 2020.

2.5 § 257.90(e)(5) OTHER REQUIREMENTS

Other information required to be included in the annual report as specified in §§ 257.90 through 257.98.

A summary of potentially required information and the corresponding section of the Rule is provided in the following sections. In addition, the information, if applicable, is provided.

2.5.1 § 257.90(e) Program Status

Status of Groundwater Monitoring and Corrective Action Program.

The groundwater monitoring and corrective action program is in detection monitoring.

Summary of Key Actions Completed.

a. completion of the Fall 2019 verification sampling and analyses per the certified statistical method,

b. completion of the statistical evaluation of the Fall 2019 semiannual detection monitoring sampling and analysis event per the certified statistical method,

c. completion of the 2019 Annual Groundwater Monitoring and Corrective Action Report,

d. completion of a successful alternative source demonstration for the Fall 2019 semiannual detection monitoring sampling and analysis event,

e. completion of the Spring 2020 semiannual detection monitoring sampling and analysis event with subsequent verification sampling per the certified statistical method, and supplemental Appendix IV sample analysis,

f. completion of the statistical evaluation of the Spring 2020 semiannual detection monitoring sampling and analysis event per the certified statistical method,

g. completion of a successful alternative source demonstration for the Spring 2020 semiannual detection monitoring sampling and analysis event, and

h. initiation of the Fall 2020 semiannual detection monitoring sampling and analysis event.

Description of Any Problems Encountered.

No noteworthy problems were encountered.

Discussion of Actions to Resolve the Problems.

Not applicable because no noteworthy problems were encountered.

Projection of Key Activities for the Upcoming Year (2021).

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2020 detection monitoring sampling and analysis event. Semiannual Spring and Fall 2020 groundwater sampling and analysis. Completion of the statistical evaluation of the Spring 2020 detection monitoring sampling and analysis event, and, if required, alternative source demonstration(s).

2.5.2 § 257.94(d)(3) Demonstration for Alternative Detection Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because no alternative monitoring frequency for detection monitoring and certification was pursued.

2.5.3 § 257.94(e)(2) Detection Monitoring Alternate Source Demonstration

Demonstration that a source other than the CCR unit caused the statistically significant increase (SSI) over background levels for a constituent or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. In addition, certification of the demonstration is to be included in the annual report.

The following demonstration reports are included as **Appendix C**:

C1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (June 2020)

C2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2020 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (December 2020)

2.5.4 § 257.95(c)(3) Demonstration for Alternative Assessment Monitoring Frequency

The owner or operator must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority stating that the demonstration for an alternative groundwater sampling and analysis frequency meets

the requirements of this section. The owner or operator must include the demonstration providing the basis for the alternative monitoring frequency and the certification by a qualified professional engineer or the approval from the Participating State Director or the approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

Not applicable because there was no assessment monitoring conducted.

2.5.5 § 257.95(d)(3) Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the concentrations of Appendix III and detected Appendix IV constituents from the assessment monitoring, the established background concentrations, and the established groundwater protection standards.

Not applicable because there was no assessment monitoring conducted.

2.5.6 § 257.95(g)(3)(ii) Assessment Monitoring Alternate Source Demonstration

Demonstrate that a source other than the CCR unit caused the contamination, or that the statistically significant increase resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Any such demonstration must be supported by a report that includes the factual or evidentiary basis for any conclusions and must be certified to be accurate by a qualified professional engineer. If a successful demonstration is made, the owner or operator must continue monitoring in accordance with the assessment monitoring program pursuant to this section, and may return to detection monitoring if the constituents in appendices III and IV to this part are at or below background as specified in paragraph (e) of this section. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.5.7 § 257.96(a) Demonstration for Additional Time for Assessment of Corrective Measures

Within 90 days of finding that any constituent listed in appendix IV to this part has been detected at a statistically significant level exceeding the groundwater protection standard defined under § 257.95(h), or immediately upon detection of a release from a CCR unit, the owner or operator must initiate an assessment of corrective measures to prevent further releases, to remediate any releases and to restore affected area to original conditions. The assessment of corrective measures must be completed within 90 days, unless the owner or operator demonstrates the need for additional time to complete the assessment of corrective measures due to site-specific conditions or circumstances. The owner or operator must obtain a certification from a qualified professional engineer attesting that the demonstration is accurate. The 90-day deadline to complete the assessment of corrective measures may be extended for no longer than 60 days. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer or the approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

Not applicable because there was no assessment monitoring conducted.

2.6 § 257.90(e)(6) OVERVIEW SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit.

§ 257.90(e)(6) is addressed in Section 1.1 of this report.

3 GENERAL COMMENTS

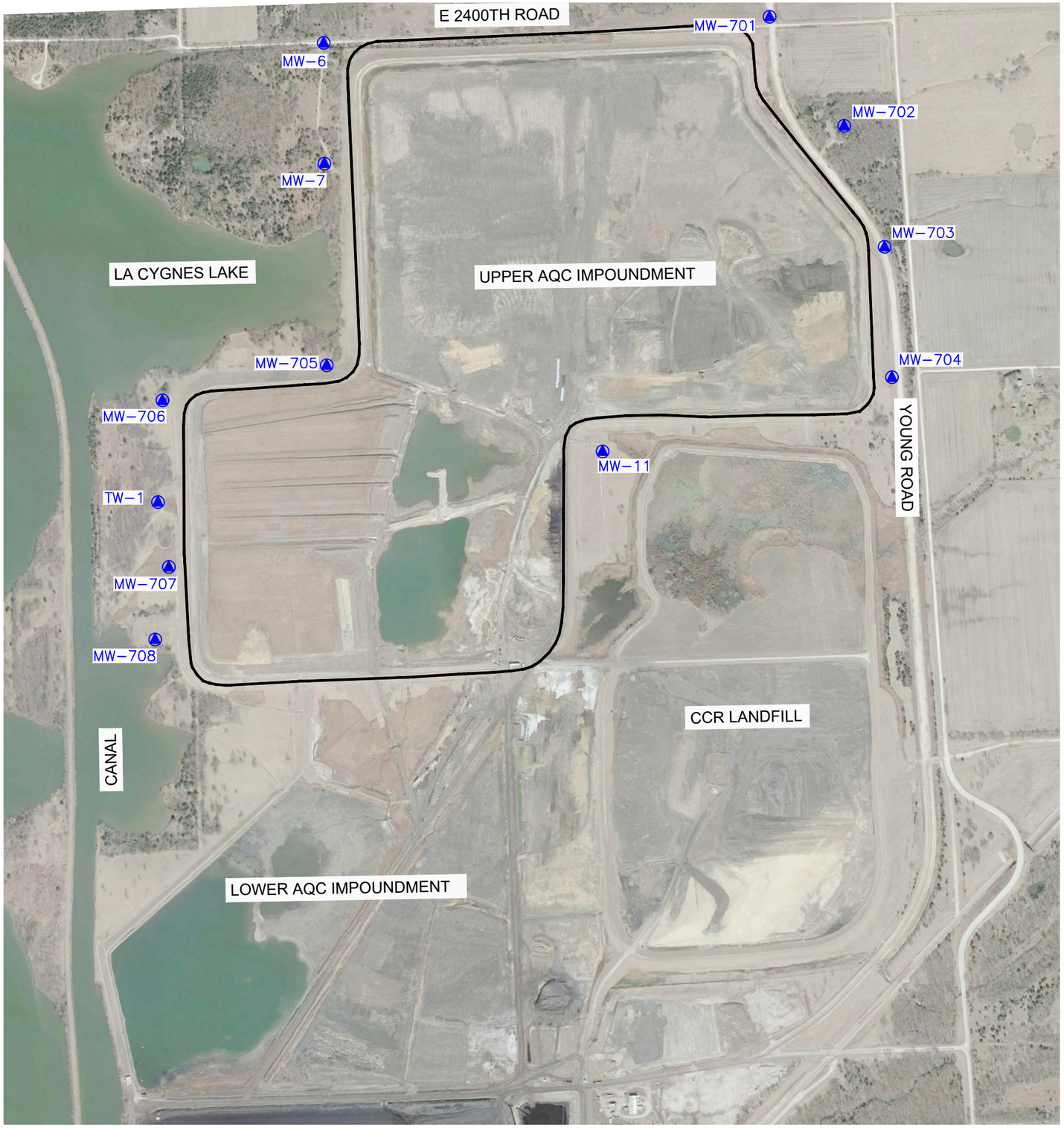
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. The information contained in this report is a reflection of the conditions encountered at the La Cygne Generating Station at the time of fieldwork. This report includes a review and compilation of the required information and does not reflect any variations of the subsurface, which may occur between sampling locations. Actual subsurface conditions may vary and the extent of such variations may not become evident without further investigation.

Conclusions drawn by others from the result of this work should recognize the limitation of the methods used. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Metro, Inc. for specific application to the La Cygne Generating Station Upper AQC Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map



LEGEND

CCR UNIT BOUNDARY
(APPROXIMATE LIMITS OF UPPER AQC IMPOUNDMENT)

MW-703 CCR GROUNDWATER MONITORING SYSTEM WELLS

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. GOOGLE EARTH IMAGE DATED MARCH 2020. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.

800 0 800 1600
SCALE FEET

REV.	DATE	CK BY
0	-	-
1	-	-
2	-	-
3	-	-
4	-	-

SHEET TITLE
SITE MAP
UPPER AQC IMPOUNDMENT
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2020 CCR GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT

CLIENT
EVERGY METRO, INC
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

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PROJ. NO. 27217233.20
DSN. BY: ALR
CHK. BY: JF
Q/A RVW BY: JRR
PROJ. MGR JRR
DSN. BY: ALR

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LA CYGNE LF LAQC IMP & UAQC FIG 1_NOVEMBER 2020 - COMBINED.DWG

DATE:
1/15/21

FIGURE NO.
1

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APPENDIX B

TABLES

Table 1: Appendix III with Supplemental Appendix IV Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Upper AQC Impoundment
Appendix III with Supplemental Appendix IV Detection Monitoring Results
Evergy LaCygne Generating Station

Well Number	Sample Date	Appendix III Constituents							Appendix IV Constituents															
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Fluoride (mg/L)	Lead (mg/L)	Lithium (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)	Selenium (mg/L)	Thallium (mg/L)	Radium Combined (pCi/L)
MW-6	1/14/2020	---	---	---	---	*7.43	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	2/3/2020	---	---	---	---	*7.30	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6	5/19/2020	1.11	78.8	191	0.541	7.31	133	1140	<0.00400	<0.00200	0.137	<0.00200	<0.00100	<0.0100	<0.0100	0.541	<0.00500	0.0432	<0.000200	<0.00500	<0.00200	<0.00200	2.42
MW-6	11/12/2020	1.14	82.4	205	0.561	7.28	133	1130	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	5/19/2020	1.53	21.8	95.9	1.18	7.81	<5.00	896	<0.00400	<0.00200	0.490	<0.00200	<0.00100	<0.0100	<0.0100	1.18	<0.00500	0.0683	<0.000200	<0.00500	<0.00200	<0.00200	1.72
MW-7	11/12/2020	1.56	20.5	94.2	1.25	7.80	1.12	917	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-11	5/19/2020	0.891	62.2	112	0.507	7.48	194	904	<0.00400	<0.00200	0.0323	<0.00200	<0.00100	<0.0100	<0.0100	0.507	<0.00500	0.0590	<0.000200	<0.00500	<0.00200	<0.00200	2.54
MW-11	11/12/2020	1.19	54.2	84.1	0.573	7.24	179	920	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-701	5/19/2020	0.913	44.7	48.3	0.630	7.53	84.0	545	<0.00400	<0.00200	0.201	<0.00200	<0.00100	<0.0100	<0.0100	0.630	<0.00500	0.0362	<0.000200	<0.00500	<0.00200	<0.00200	2.08
MW-701	7/13/2020	---	*41.3	---	---	**7.71	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-701	11/12/2020	0.920	45.4	49.1	0.607	7.65	86.2	569	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-702	5/19/2020	1.34	3.33	38.0	1.19	8.92	<5.00	406	<0.00400	<0.00200	0.133	<0.00200	<0.00100	<0.0100	<0.0100	1.19	<0.00500	0.118	<0.000200	<0.00500	<0.00200	<0.00200	0.5
MW-702	11/12/2020	1.53	3.60	39.4	1.19	8.95	1.64	563	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-703	5/19/2020	1.78	18.5	107	1.41	7.44	<5.00	823	<0.00400	<0.00200	0.275	<0.00200	<0.00100	<0.0100	<0.0100	1.41	<0.00500	0.0596	<0.000200	<0.00500	<0.00200	<0.00200	1.33
MW-703	11/12/2020	1.83	18.4	109	1.61	7.27	<5.00	934	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-704	5/19/2020	1.87	20.9	93.0	0.857	7.53	148	1050	<0.00400	<0.00200	0.0726	<0.00200	<0.00100	<0.0100	<0.0100	0.857	<0.00500	0.0921	<0.000200	0.00509	<0.00200	<0.00200	3.52
MW-704	7/13/2020	---	---	*90.1	---	**7.73	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-704	8/27/2020	---	---	*92.2	---	**7.41	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-704	11/12/2020	1.97	21.5	90.2	0.885	7.56	171	1200	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-705	1/14/2020	---	---	---	---	*7.31	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-705	5/19/2020	2.10	29.4	132	0.955	7.30	39.3	822	<0.00400	<0.00200	0.0887	<0.00200	<0.00100	<0.0100	<0.0100	0.955	<0.00500	0.113	<0.000200	<0.00500	<0.00200	<0.00200	0.343
MW-705	11/12/2020	2.07	28.8	141	1.02	6.92	40.1	1000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-706	1/14/2020	---	---	---	---	**7.79	*9.78	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-706	2/3/2020	---	---	---	---	**7.38	*32.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-706	5/19/2020	1.94	24.8	225	1.03	7.55	24.6	952	<0.00400	<0.00200	0.199	<0.00200	<0.00100	<0.0100	<0.0100	1.03	<0.00500	0.116	<0.000200	<0.00500	<0.00200	<0.00200	1.52
MW-706	7/13/2020	---	---	---	---	**7.60	*21.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-706	8/27/2020	---	---	---	---	**7.20	*20.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-706	11/12/2020	1.98	24.4	244	1.05	7.11	20.0	1180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-707B	5/19/2020	1.81	424	172	0.325	6.78	5310	5810	<0.00400	<0.00200	0.0241	<0.00200	<0.00100	<0.0100	0.0121	0.325	<0.00500	1.01	<0.000200	<0.00500	<0.00200	<0.00200	0.21
MW-707B	7/13/2020	---	*421	---	---	**6.88	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-707B	11/12/2020	1.83	404	267	0.196	7.15	5250	8180	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-708	1/14/2020	---	---	---	---	**7.58	*9.45	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-708	5/19/2020	1.26	30.2	43.6	0.502	7.48	9.42	586	<0.00400	<0.00200	0.202	<0.00200	<0.00100	<0.0100	<0.0100	0.502	<0.00500	0.0691	<0.000200	<0.00500	<0.00200	<0.00200	0.123
MW-708	11/12/2020	1.32	30.1	45.5	0.590	7.52	9.88	632	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TW-1	5/19/2020	1.37	25.0	40.5	0.405	7.82	69.1	864	<0.00400	<0.00200	0.0656	<0.00200	<0.00100	<0.0100	<0.0100	0.405	<0.00500	0.127	<0.000200	<0.00500	<0.00200	<0.00200	1.18
TW-1	7/13/2020	---	---	---	---	**7.76	*69.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TW-1	8/27/2020	---	---	---	---	**7.45	*72.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TW-1	11/12/2020	1.38	24.6	40.5	0.384	7.72	73.8	1050	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.
**Extra Sample for Quality Control Validation or per Standard Sampling Procedure
mg/L - miligrams per liter
pCi/L - picocuries per liter
S.U. - Standard Units
--- Not Sampled

Table 2
Upper AQC Impoundment
Detection Monitoring Field Measurements
Evergy LaCygne Generating Station

Well Number	Sample Date	pH (S.U.)	Specific Conductivity (µS)	Temperature (°C)	Turbidity (NTU)	ORP (mV)	DO (mg/L)	***Water Level (ft btoc)	Groundwater Elevation (ft NGVD)
MW-6	1/14/2020	*7.43	2030	13.69	3.1	-104	0.00	9.64	851.04
MW-6	2/3/2020	*7.30	2040	11.95	0.0	-92	2.27	8.45	852.23
MW-6	5/19/2020	7.31	1890	15.93	0.0	-28	0.00	9.52	851.16
MW-6	11/12/2020	7.28	1730	14.82	0.0	-45	0.00	9.63	851.05
MW-7	5/19/2020	7.81	1490	14.93	0.0	-48	9.31	5.90	849.76
MW-7	11/12/2020	7.80	1400	14.48	0.0	65	0.00	7.15	848.51
MW-11	5/19/2020	7.48	1580	15.59	0.9	117	0.00	2.61	874.37
MW-11	11/12/2020	7.24	1440	15.60	0.0	-38	0.35	4.41	872.57
MW-701	5/19/2020	7.53	952	15.55	12.7	62	0.00	7.16	878.07
MW-701	7/13/2020	**7.71	862	20.83	0.0	-23	1.22	9.30	875.93
MW-701	11/12/2020	7.65	958	15.83	0.0	-15	0.69	12.15	873.08
MW-702	5/19/2020	8.92	929	14.66	0.0	86	0.00	18.02	865.15
MW-702	11/12/2020	8.95	963	14.53	1.9	132	2.37	20.67	862.50
MW-703	5/19/2020	7.44	1580	14.61	4.8	11	0.00	6.17	877.67
MW-703	11/12/2020	7.27	1640	15.66	0.0	-110	1.71	6.40	877.44
MW-704	5/19/2020	7.53	1950	15.68	4.1	92	0.00	10.60	872.57
MW-704	7/13/2020	**7.73	1770	18.88	0.0	10	1.95	15.90	867.27
MW-704	8/27/2020	**7.41	2000	21.89	0.0	31	5.10	15.24	867.93
MW-704	11/12/2020	7.56	1890	16.23	0.0	7	0.49	13.65	869.52
MW-705	1/14/2020	*7.31	1760	13.55	6.1	-50	0.00	8.92	847.03
MW-705	5/19/2020	7.30	1690	15.41	0.0	-46	0.00	9.58	846.37
MW-705	11/12/2020	6.92	1760	16.35	0.0	-71	1.47	9.90	846.05
MW-706	1/14/2020	**7.79	2200	13.54	10.6	-28	0.00	8.81	845.47
MW-706	2/3/2020	**7.38	2160	13.22	0.0	-107	1.57	8.73	845.55
MW-706	5/19/2020	7.55	2030	16.12	7.5	-47	0.00	8.78	845.50
MW-706	7/13/2020	**7.60	1880	18.07	1.0	-13	1.46	10.17	844.11
MW-706	8/27/2020	**7.20	2110	20.53	0.0	-74	5.92	10.82	843.46
MW-706	11/12/2020	7.11	2180	15.97	0.0	-76	1.96	10.27	844.01
MW-707B	5/19/2020	6.78	8310	17.19	31.8	42	0.00	5.62	853.18
MW-707B	7/13/2020	**6.88	7670	18.72	42.0	45	1.37	8.60	850.20
MW-707B	11/12/2020	7.15	7530	15.26	27.9	124	0.00	7.26	851.54
MW-708	1/14/2020	**7.58	1190	14.06	7.0	62	0.00	6.77	846.26
MW-708	5/19/2020	7.48	1110	16.73	0.0	44	0.00	7.10	845.93
MW-708	11/12/2020	7.52	1040	15.55	0.0	100	0.00	8.60	844.43
TW-1	5/19/2020	7.82	1650	17.75	0.0	38	4.49	17.14	844.96
TW-1	7/13/2020	**7.76	1590	18.08	0.0	98	4.02	17.81	844.29
TW-1	8/27/2020	**7.45	1610	24.63	0.0	49	1.80	18.03	844.07
TW-1	11/12/2020	7.72	1540	15.28	0.0	102	0.00	17.33	844.77

* Verification Sample obtained per certified statistical method and Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009.

**Extra Sample for Quality Control Validation or per Standard Sampling Procedure

***Depth to water measured in all monitoring wells within 24 hour period prior to the sampling event

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

APPENDIX C

ALTERNATIVE SOURCE DEMONSTRATIONS

C1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (June 2020)

C2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2020 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (December 2020)

C1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2019 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (June 2020)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
NOVEMBER 2019 GROUNDWATER MONITORING EVENT

UPPER AQC IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

(913) 681-0030

June 2020

File No. 27217233.20

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and licensed Professional Geologist in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Upper AQC Impoundment at the La Cygne Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Upper AQC Impoundment at the La Cygne Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.

Douglas L. Doerr, P.E.

SCS Engineers

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Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the CCR Upper AQC Impoundment at the La Cygne Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on November 7, 2019. Review and validation of the results from the November 2019 Detection Monitoring Event was completed on December 17, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on January 14, 2020 and February 3, 2020.

The completed statistical evaluation identified one Appendix III constituent above the prediction limit established for monitoring well MW-706.

Constituent/Monitoring Well	*UPL	Observation November 7, 2019	1st Verification January 14, 2020	2nd Verification February 3, 2020
Sulfate				
MW-706	8.79	9.68	9.78	32.8

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified a SSI above the background prediction limit for sulfate in monitoring well MW-706.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above identified SSI for the Upper AQC Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate they are not caused by a release from the Upper AQC Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Upper AQC Impoundment at the time of sampling. The groundwater flow directions indicated are for the November 2019 groundwater monitoring event and are typical flow directions for this unit. As seen in the map, monitoring well MW-701 is located upgradient from the Upper AQC Impoundment indicating that naturally occurring sulfate levels can be significantly higher than the sulfate levels in MW-706. Therefore, natural groundwater flow from upgradient of the Upper AQC Impoundment could contribute to the geochemistry of groundwater downgradient of the Upper AQC Impoundment and cause the sulfate level to increase. This demonstrates that a source other than the Upper AQC Impoundment caused the SSI above the background level for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

Box and whiskers plots were prepared for sulfate for upgradient wells MW-701, MW-702, and MW-703 and downgradient well MW-706. Although the sulfate SSI was only identified in downgradient well MW-706 the box and whiskers plots show that it is below the sulfate range for upgradient well MW-701. The comparison indicates the sulfate level in upgradient well MW-701 is greater than the sulfate level in MW-706. This demonstrates that a source other than the Upper AQC Impoundment caused the SSI above background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whiskers plots are provided in **Appendix B**.

3.3 TIME SERIES PLOTS

Time series plots provide a graphical method to view changes in data at a particular well (monitoring point) or wells over time. Time series plots display the variability in concentration levels over time and can

be used to indicate possible outliers or data errors. More than one well can be compared on the same plot to look for differences between wells. Non-detect data is plotted as censored data at one-half of the laboratory reporting limit. Time series plots can also be used to examine the data for trends.

Time series plots for sulfate were prepared for the CCR monitoring system upgradient wells MW-701, MW-702, and MW-703 and downgradient well MW-706. Although the sulfate SSI was only identified in downgradient well MW-706, the time series plots show that sulfate in downgradient well MW-706 is below the sulfate range for upgradient well MW-701. The comparison indicates the sulfate level in upgradient well MW-701 is greater than the sulfate level in downgradient well MW-706. This demonstrates that a source other than the Upper AQC Impoundment caused the sulfate SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

3.4 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram was generated for samples from upgradient wells MW-701, MW-702, and MW-703 and from downgradient well MW-706. The samples from downgradient well MW-706 plot between the samples from upgradient wells MW-701 and MW-702 and between samples from MW-701 and MW-703 indicating similar geochemical characteristics to upgradient wells. Additionally of note, the difference between the upgradient wells indicates that natural variability occurs between relatively close upgradient wells and is likely to occur across the site. This demonstrates that a source other than the Upper AQC Impoundment caused the SSI for sulfate in MW-706, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The piper diagram plots and analytical results are provided in **Appendix D**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Upper AQC Impoundment caused the SSI for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the

successful ASD, the owner or operator of the Upper AQC Impoundment may continue with the detection monitoring program under § 257.94.

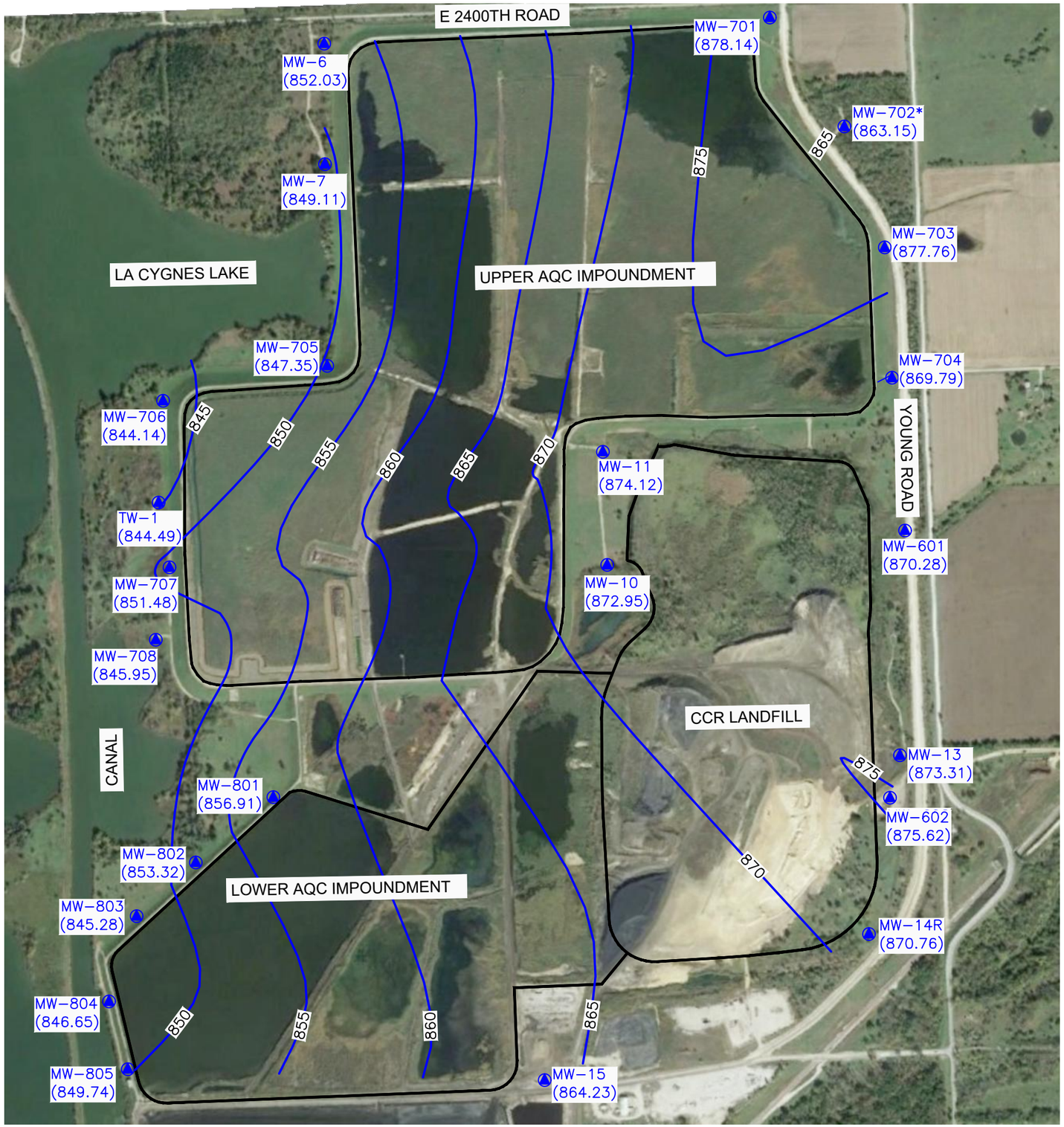
5 GENERAL COMMENTS

This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Metro, Inc. for specific application to the La Cygne Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinions that the aforementioned information is accurate as of the date of such signatures. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1



LEGEND

- CCR UNIT BOUNDARY (APPROXIMATE LIMITS OF UPPER AQC IMPOUNDMENT)
- MW-703 (877.00) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- —875— GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS (REPRESENTATIVE FOR THIS UNIT)
- MW-702* INDICATES WELL NOT USED IN POTENTIOMETRIC SURFACE MAP CREATION

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. GOOGLE EARTH IMAGE DATED OCTOBER 2014. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.

800 0 800 1600
SCALE FEET

REV.	DATE	CK. BY
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-

SHEET TITLE: POTENTIOMETRIC SURFACE MAP (NOVEMBER 2019) COMBINED UAQC/LANDFILL - LAQC IMPOUNDMENT

PROJECT TITLE: ALTERNATIVE SOURCE DEMONSTRATION

CLIENT: EVERGY METRO, INC.
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

SCS ENGINEERS
7311 W. 130th St, Ste. 100
Overland Park, Kansas 66213
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DWN. BY:	O/A RVW BY:
27217233.00	DAW	JRR
DSN. BY:	CHK. BY:	PROJ. MGR:
DAW	JF	JRR

CADD FILE: LA CYGNE LF LAQC IMP & UAQC FIG 1_NOV 2019 - COMBINED.DWG

DATE: 1/30/20

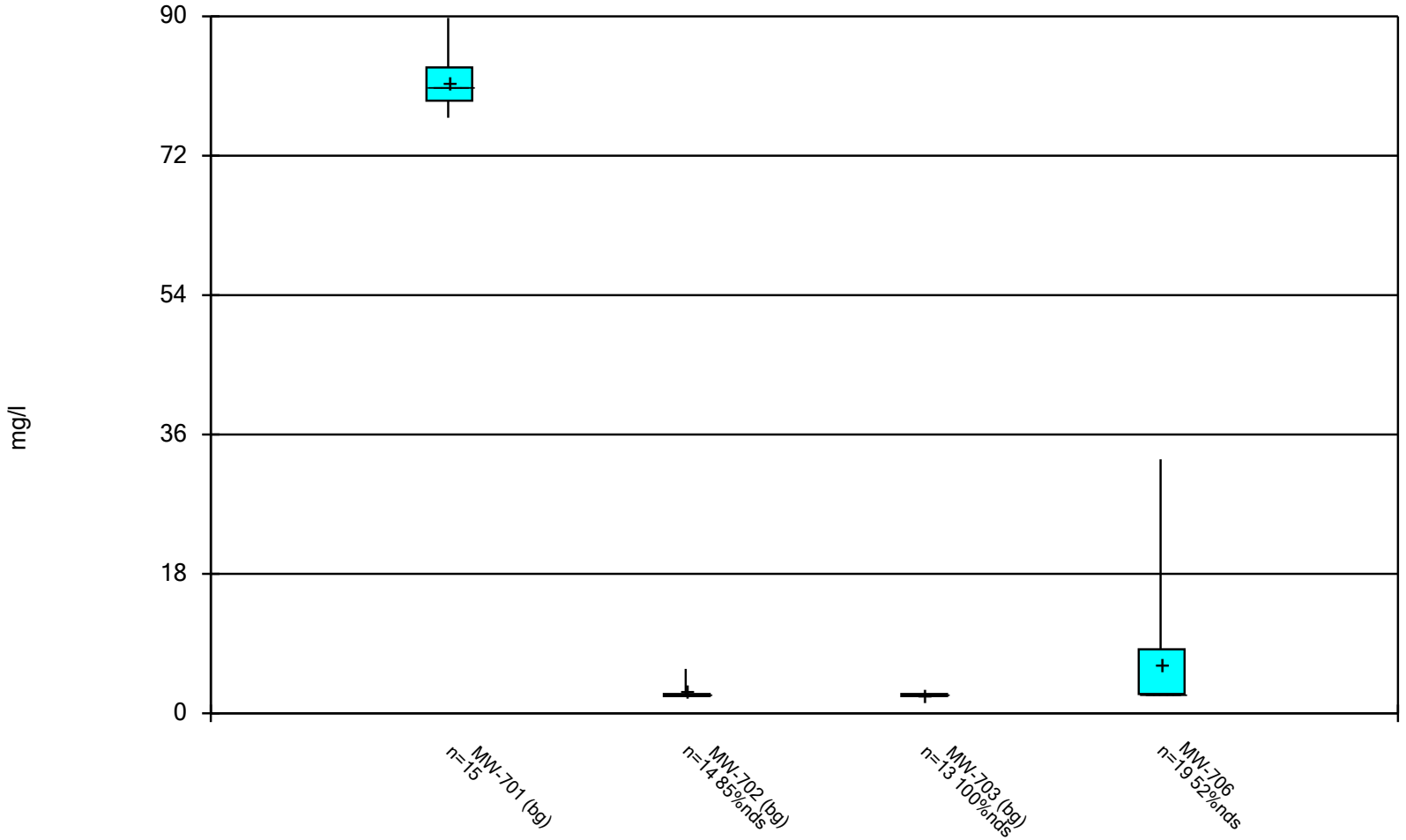
FIGURE NO. 1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\2019\La Cygne LF LAQC Imp & UAQC Fig 1_NOV 2019 - COMBINED.dwg Jan 30, 2020 - 10:51am Layout Name: Fig 1 Combined By: 4470daw

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: SULFATE Analysis Run 3/13/2020 10:18 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 3/13/2020, 10:20 AM

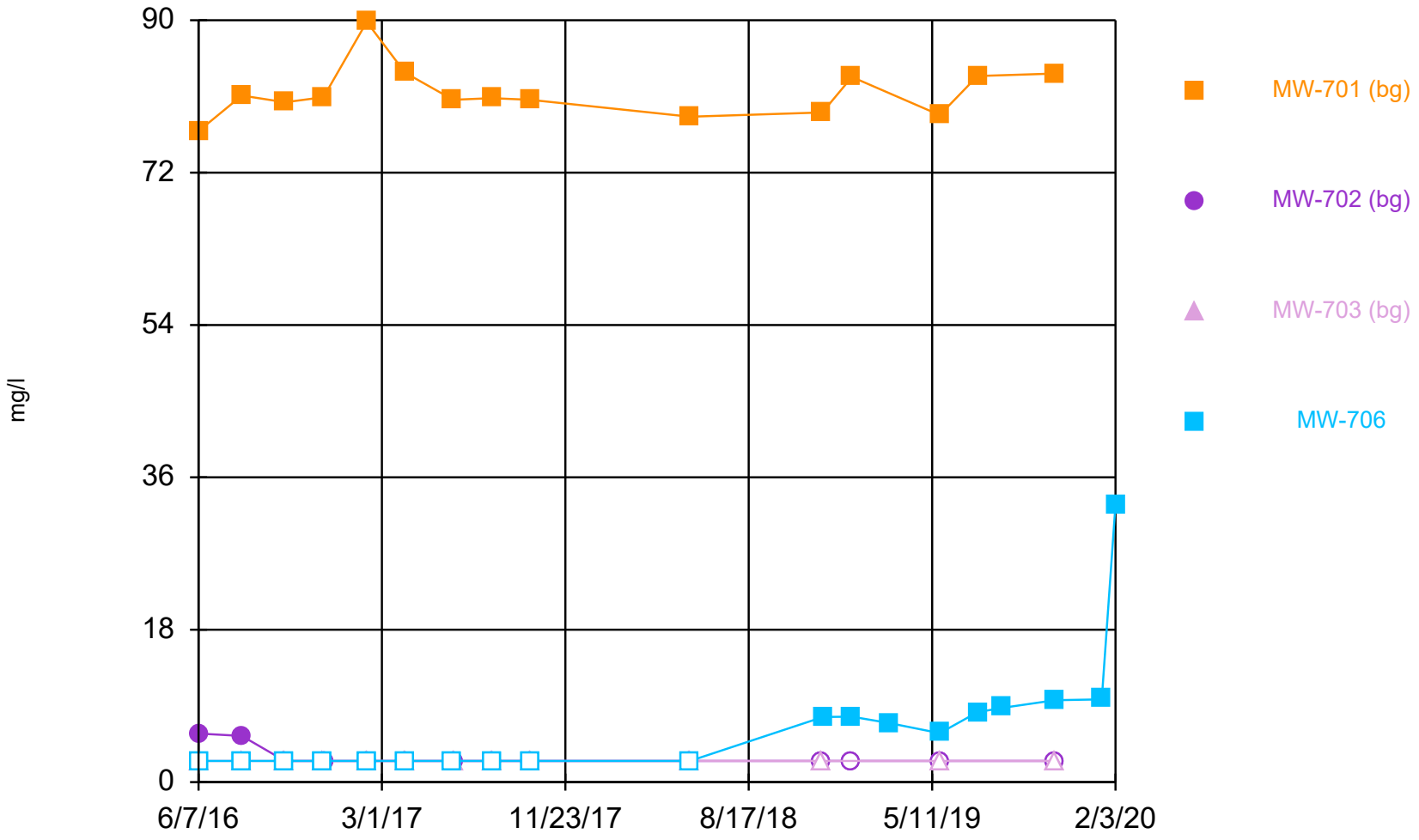
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
SULFATE (mg/l)	MW-701 (bg)	15	81.45	3.077	0.7944	80.8	76.9	89.8	0
SULFATE (mg/l)	MW-702 (bg)	14	2.942	1.125	0.3007	2.5	2.5	5.73	85.71
SULFATE (mg/l)	MW-703 (bg)	13	2.5	0	0	2.5	2.5	2.5	100
SULFATE (mg/l)	MW-706	19	6.446	7.01	1.608	2.5	2.5	32.8	52.63

Appendix C

Time Series Plots

Sanitas™ v.9.6.25 Sanitas software licensed to SCS Engineers. UG
Hollow symbols indicate censored values.

Time Series



Constituent: SULFATE Analysis Run 3/13/2020 10:21 AM View: Upper AQC III

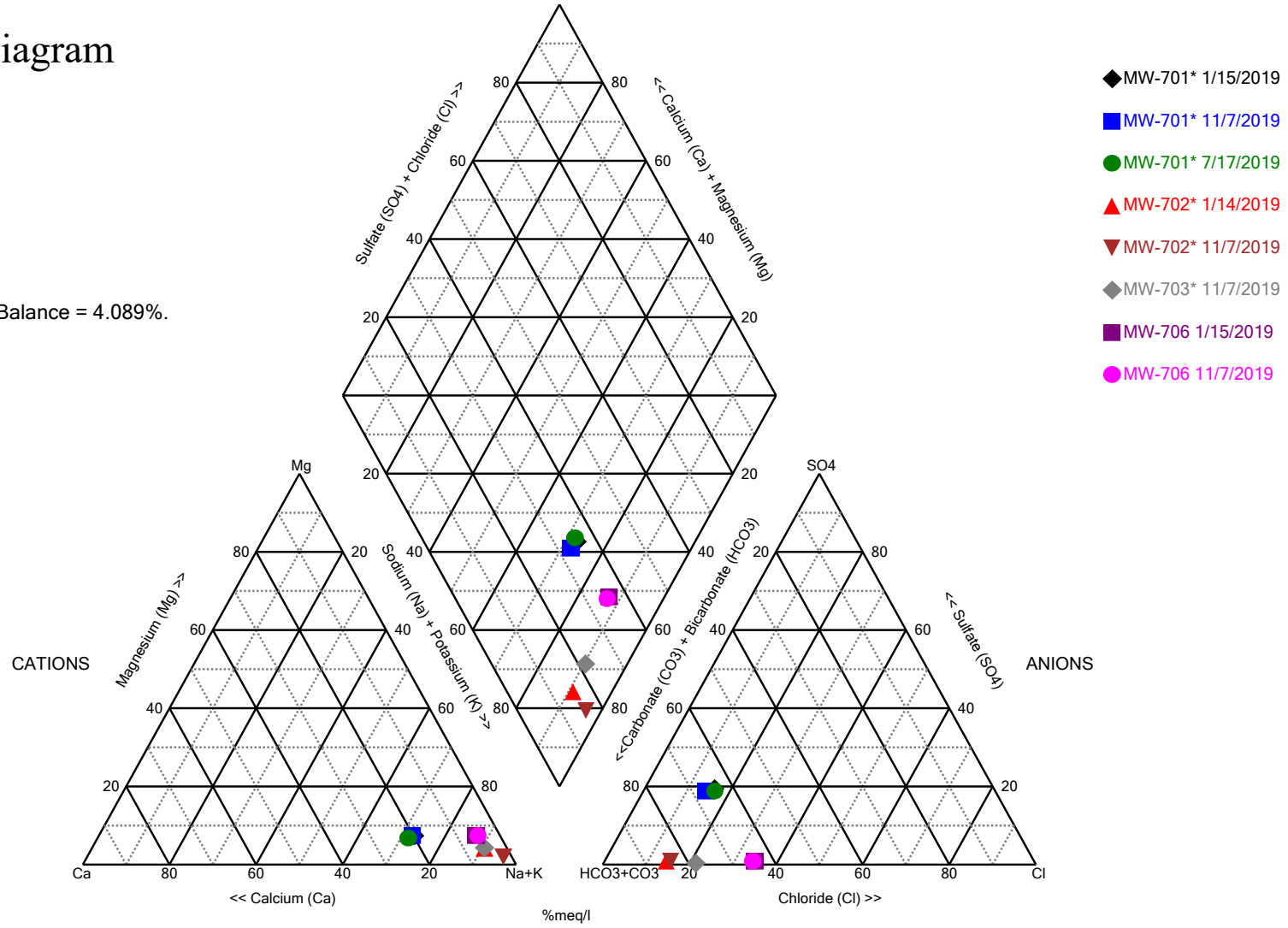
LaCygne Client: SCS Engineers Data: LaC GW Data

Appendix D

Piper Diagram Plots and Analytical Results

Piper Diagram

Cation-Anion Balance = 4.089%.



Analysis Run 3/13/2020 10:37 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Piper Diagram

Analysis Run 3/13/2020 10:39 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
MW-701* 1/15/2019	169	3.11	40.2	8.79	47.9	83.3	336	10
MW-701* 7/17/2019	172	2.91	45	8.71	50.7	83.4	349	10
MW-701* 11/7/2019	163	2.85	40.4	8.6	46.2	83.7	369	10
MW-702* 1/14/2019	230	3.14	11.2	5.24	43	2.5	461	10
MW-702* 11/7/2019	167	2.58	2.73	1.7	40.7	2.5	249	87.9
MW-703* 11/7/2019	339	3.53	17.6	8.07	111	2.5	725	10
MW-706 1/15/2019	442	6.52	24.7	19.5	238	7.73	769	10
MW-706 11/7/2019	427	6.26	22.5	19	240	9.68	806	10

C2 CCR Groundwater Monitoring Alternative Source Demonstration Report May 2020 Groundwater Monitoring Event, Upper AQC Impoundment, La Cygne Generating Station (December 2020)

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
MAY 2020 GROUNDWATER MONITORING EVENT

UPPER AQC IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

(913) 681-0030

December 2020

File No. 27217233.20

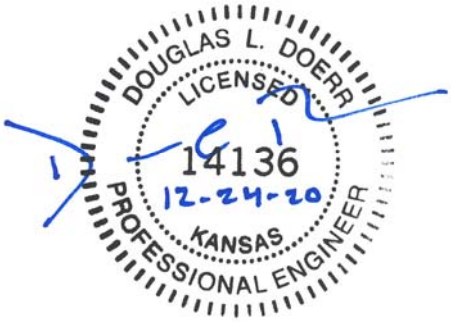
CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and licensed Professional Geologist in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Upper AQC Impoundment at the La Cygne Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted hydrogeological practices and the local standard of care.

John R. Rockhold, P.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Kansas, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the Upper AQC Impoundment at the La Cygne Generating Station. The Alternative Source Demonstration was prepared by me or under my direct supervision in accordance with generally accepted engineering practices and the local standard of care.



Douglas L. Doerr, P.E.

SCS Engineers

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Section **Page**

Appendices

1 REGULATORY FRAMEWORK

Certain owners or operators of Coal Combustion Residuals (CCR) units are required to complete groundwater monitoring activities to evaluate whether a release from the unit has occurred. Included in the activities is the completion of a statistical analysis of the groundwater quality data as prescribed in § 257.93(h) of the CCR Final Rule. If the initial analysis indicates a statistically significant increase (SSI) over background levels, the owner or operator may perform an alternative source demonstration (ASD). In accordance with § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate that a source other than the CCR unit caused the SSI over background levels for a constituent, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The owner or operator must complete the written demonstration within 90 days of detecting a SSI over background levels to include obtaining a certification from a qualified professional engineer verifying the accuracy of the information in the report. If a successful demonstration is completed within the 90-day period, the owner or operator of the CCR unit may continue with a detection monitoring program under § 257.94. If a successful demonstration is not completed within the 90-day period, the owner or operator of the CCR unit must initiate an assessment monitoring program as required under § 257.95. The owner or operator must also include the demonstration in the annual groundwater monitoring and corrective action report required by § 257.90(e), in addition to the certification by a qualified professional engineer.

2 STATISTICAL RESULTS

Statistical analysis of monitoring data from the groundwater monitoring system for the Upper AQC Impoundment at the La Cygne Generating Station has been completed in substantial compliance with the "Statistical Method Certification by A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on May 19, 2020. Review and validation of the results from the May 2020 Detection Monitoring Event was completed on June 29, 2020, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a statistically significant increase (SSI) over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring. Two rounds of verification sampling were conducted for certain constituents on July 13, 2020 and August 27, 2020.

The completed statistical evaluation identified two Appendix III constituents above their respective prediction limits established for monitoring wells MW-704, MW-706 and TW-1.

Constituent/Monitoring Well	*UPL	Observation May 19, 2020	1st Verification July 13, 2020	2nd Verification August 27, 2020
Chloride				
MW-704	88.89	93	90.1	92.2
Sulfate				
MW-706	8.79	24.6	21.3	20.7
TW-1	67.15	69.1	69.4	72.4

*UPL – Upper Prediction Limit

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified three SSIs above the background prediction limit for chloride for MW-704, and sulfate for monitoring wells MW-706 and TW-1.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration is a means to provide supporting lines of evidence that something other than a release from a regulated CCR unit caused an SSI. For the above identified SSI for the Upper AQC Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate they are not caused by a release from the Upper AQC Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 UPGRADIENT WELL LOCATION

Figure 1 in **Appendix A** shows a potentiometric surface contour map indicating the direction of groundwater flow at and near the Upper AQC Impoundment at the time of sampling. The groundwater flow directions indicated are for the November 2020 groundwater monitoring event and are typical flow directions for this unit. Upgradient monitoring well MW-701 has higher sulfate concentrations than both MW-706 and TW-1. As seen in the map, monitoring well MW-701 is located upgradient from the Upper AQC Impoundment indicating that naturally occurring sulfate levels can be significantly higher than the sulfate levels in MW-706 and TW-1. Therefore, natural groundwater flow from upgradient of the Upper AQC Impoundment likely contributed to the geochemistry of groundwater downgradient of the Upper AQC Impoundment and caused the sulfate level to increase. This demonstrates that a source other than the Upper AQC Impoundment caused the SSI above the background level for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

3.2 BOX AND WHISKERS PLOTS

A commonly accepted method to demonstrate and visualize the distribution of data in a given data set is to construct box and whiskers plots. The basic box plotted graphically locates the median, 25th and 75th percentiles of the data set; the "whiskers" extend to the minimum and maximum values of the data set. The range between the ends of a box plot represents the Interquartile Range, which can be used as an estimate of spread or variability. The mean is denoted by a "+".

When comparing multiple wells or well groups, box plots for each well can be lined up on the same axis to roughly compare the variability in each well. This may be used as an exploratory screening for the test of homogeneity of variance across multiple wells.

Box and whiskers plots were prepared for chloride for upgradient wells MW-701, MW-702, and MW-703 and MW-704. Although the chloride SSI was only identified in MW-704, the box and whiskers plots show that it is below the chloride range for upgradient well MW-703. The comparison indicates the chloride level in upgradient well MW-703 is greater than the chloride level in MW-704. This demonstrates that a

source other than the Upper AQC Impoundment caused the SSI above background levels for chloride, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whiskers plots are provided in **Appendix B**.

Box and whiskers plots were prepared for sulfate for upgradient wells MW-701, MW-702, and MW-703 and downgradient wells MW-706 and TW-1. Although sulfate SSIs were only identified in downgradient wells MW-706 and TW-1, the box and whiskers plots show that concentrations in those wells are below the sulfate range for upgradient well MW-701. The comparison indicates the sulfate level in upgradient well MW-701 is greater than the sulfate level in MW-706 and TW-1. This demonstrates that a source other than the Upper AQC Impoundment caused the SSI above background levels for sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whiskers plots are provided in **Appendix B**.

3.3 TIME SERIES PLOTS

Time series plots provide a graphical method to view changes in data at a particular well (monitoring point) or wells over time. Time series plots display the variability in concentration levels over time and can be used to indicate possible outliers or data errors. More than one well can be compared on the same plot to look for differences between wells. Non-detect data is plotted as censored data at one-half of the laboratory reporting limit. Time series plots can also be used to examine the data for trends.

Time series plots for chloride were prepared for the CCR monitoring system upgradient wells MW-701, MW-702, and MW-703 and MW-704. Although the chloride SSI was only identified in well MW-704, the time series plots show that chloride concentrations in MW-704 are below the chloride concentrations in upgradient well MW-701. The comparison indicates the chloride level in upgradient well MW-701 is greater than the chloride level in well MW-704. This demonstrates that a source other than the Upper AQC Impoundment caused the chloride SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

Time series plots for sulfate were prepared for the CCR monitoring system upgradient wells MW-701, MW-702, and MW-703 and downgradient wells MW-706 and TW-1. Although the sulfate SSIs were only identified in downgradient wells MW-706 and TW-1, the time series plots show that sulfate concentrations in these wells are below the sulfate concentrations in upgradient well MW-701. The comparison indicates the sulfate level in upgradient well MW-701 is greater than the sulfate levels in downgradient wells MW-706 and TW-1. This demonstrates that a source other than the Upper AQC Impoundment caused the sulfate SSI or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

3.4 PIPER DIAGRAM PLOTS

Piper diagrams are a form of tri-linear diagram, and a widely accepted method to provide a visual representation of the ion concentration of groundwater. Piper diagrams portray water compositions and facilitate the interpretation and presentation of chemical analyses. They may be used to visually compare the chemical composition of water quality across wells, and aid in determining whether the waters are similar or dis-similar, and can over time indicate whether the waters are mixing.

A piper diagram has two triangular plots on the right and left side of a 4-sided center field. The three major cations are plotted in the left triangle and anions in the right. Each of the three cation/anion variables, in milliequivalents, is divided by the sum of the three values, to produce a percent of total cation/anions. These percentages determine the location of the associated symbol. The data points in the center field are located by extending the points in the lower triangles to the point of intersection. In order for a piper diagram to be produced, the selected data file must contain the following constituents: Sodium (Na), Potassium (K), Calcium (Ca), Magnesium (Mg), Chloride (Cl), Sulfate (SO4), Carbonate (CO3), and Bicarbonate (HCO3).

A piper diagram was generated for samples from upgradient wells MW-701, MW-702, and MW-703 and from wells MW-704, MW-706 and TW-1. The samples from wells MW-704, MW-706 and TW-1 plot between the samples from upgradient wells MW-701 and MW-702 and between samples from MW-701 and MW-703 indicating similar geochemical characteristics to upgradient wells. Additionally of note, the difference between the upgradient wells indicates that natural variability occurs between relatively close upgradient wells and is likely to occur across the site. This demonstrates that a source other than the Upper AQC Impoundment caused the SSIs for MW-704, MW-706 and TW-1, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The piper diagram plots and analytical results are provided in **Appendix D**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Upper AQC Impoundment caused the SSIs for chloride and sulfate, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Based on the successful ASD, the owner or operator of the Upper AQC Impoundment may continue with the detection monitoring program under § 257.94.

5 GENERAL COMMENTS

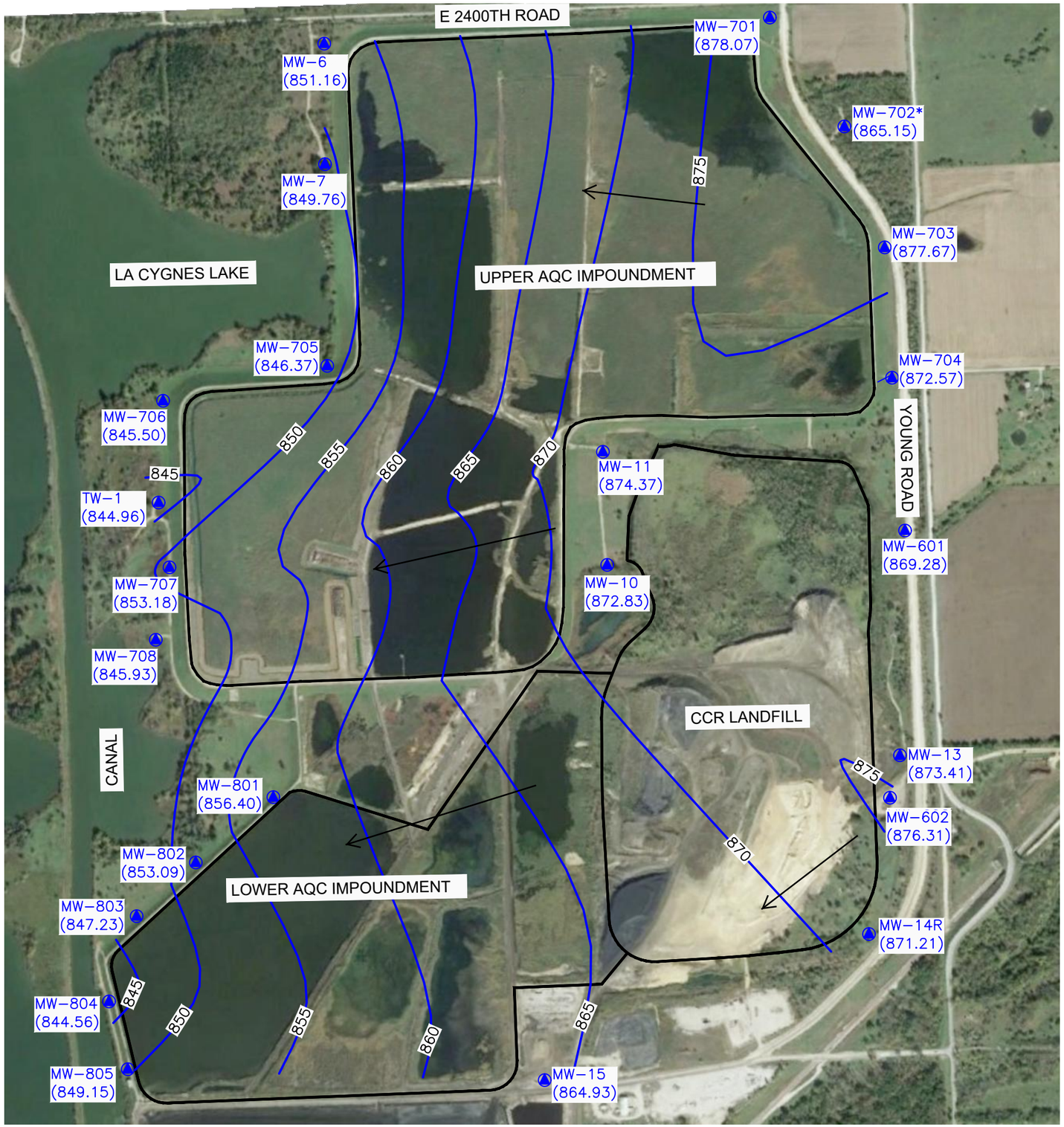
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. This report is prepared in accordance with generally accepted environmental engineering and geological practices, within the constraints of the client's directives. It is intended for the exclusive use of Evergy Metro, Inc. for specific application to the La Cygne Generating Station. No warranties, express or implied, are intended or made.

The signatures of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of their professional judgement in accordance with the standard of practice, it is their professional opinions that the aforementioned information is accurate as of the date of such signatures. Any opinion or decisions by them are made on the basis of their experience, qualifications, and professional judgement and are not to be construed as warranties or guaranties. In addition, opinions relating to regulatory, environmental, geologic, geochemical and geotechnical conditions interpretations or other estimates are based on

available data, and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Figure 1



LEGEND

- CCR UNIT BOUNDARY
- MW-703 (877.00) — CCR GROUNDWATER MONITORING WELLS
- —875— GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- MW-702* — INDICATES WELL NOT USED IN POTENTIOMETRIC SURFACE MAP CREATION
- GROUNDWATER FLOW DIRECTION

NOTES:

1. KDHE FACILITY PERMIT AND LANDFILL PERMIT BOUNDARIES VARY FROM THAT SHOWN.
2. GOOGLE EARTH IMAGE DATED OCTOBER 2014. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
3. BOUNDARY AND MONITOR WELL LOCATIONS ARE PROVIDED BY AECOM.

N

800 0 800 1600

SCALE FEET

REV.	DATE	CK. BY
0	-	-
1	-	-
2	-	-
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4	-	-
5	-	-

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (MAY 2020)

PROJECT TITLE
COMBINED UAQC/LANDFILL - LAQC IMPOUNDMENT
2020 GROUNDWATER

CLIENT
EVERGY METRO, INC
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

SCS ENGINEERS
8575 W. 110th St, Ste. 100
Overland Park, Kansas 66210
PH. (913) 681-0030 FAX. (913) 681-0012

PROJ. NO.	DSN. BY:	Q/A REW BY:
27217233.20	MBJ	JRR
DSN. BY:	CHK. BY:	PROJ. MGR
DAW	JF	JNR

CADD FILE:
LA CYGNE LF LAQC IMP & UAQC FIG 1_MAY 2020 - COMBINED.DWG

DATE:
7/16/2020

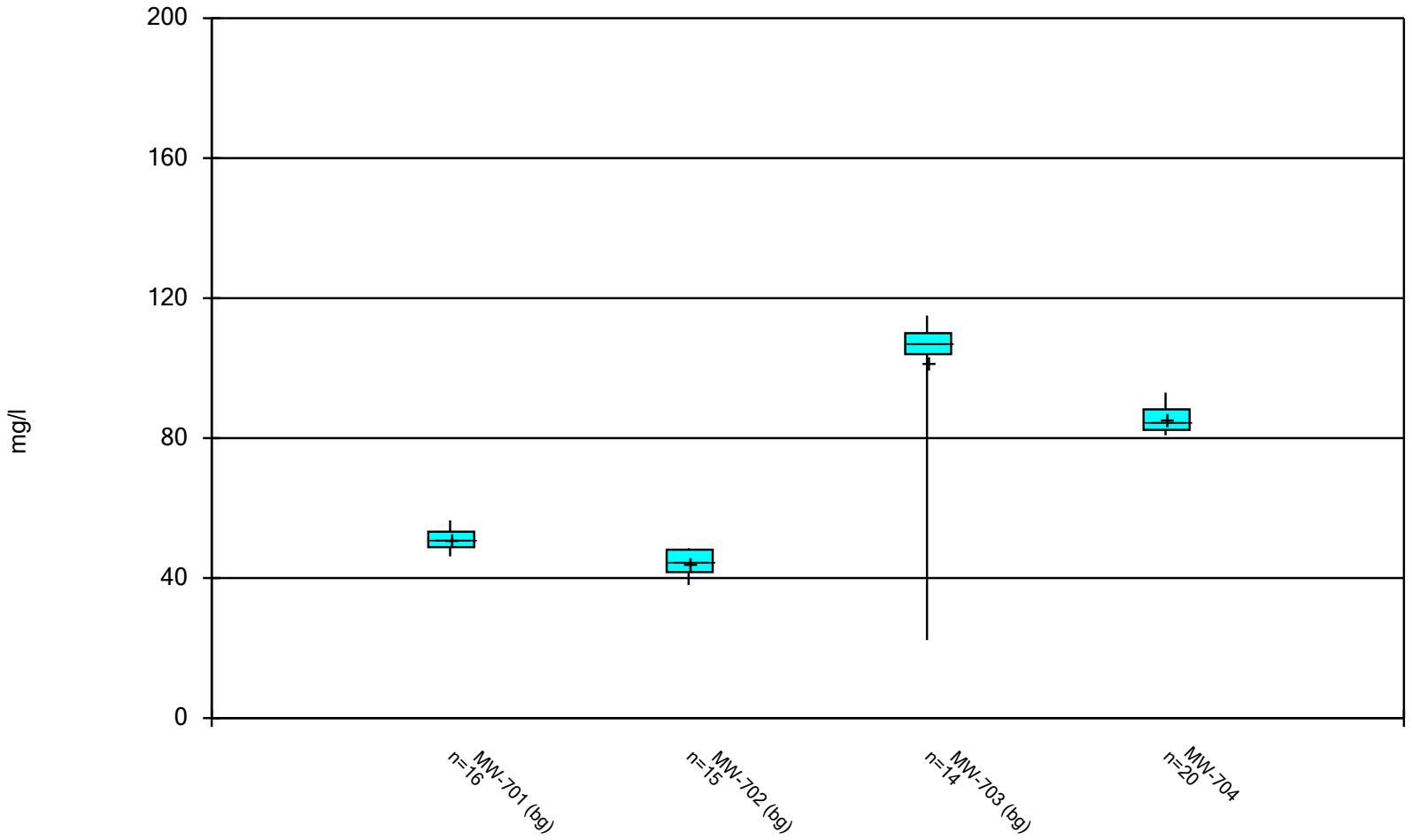
FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\2020\La Cygne LF LAQC Imp & UAQC Fig 1_MAY 2020 - COMBINED.dwg Jul 16, 2020 - 11:35am Layout Name: Fig 1 Combined By: 4503m_j

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: CHLORIDE Analysis Run 10/8/2020 8:51 AM View: Upper AQC III

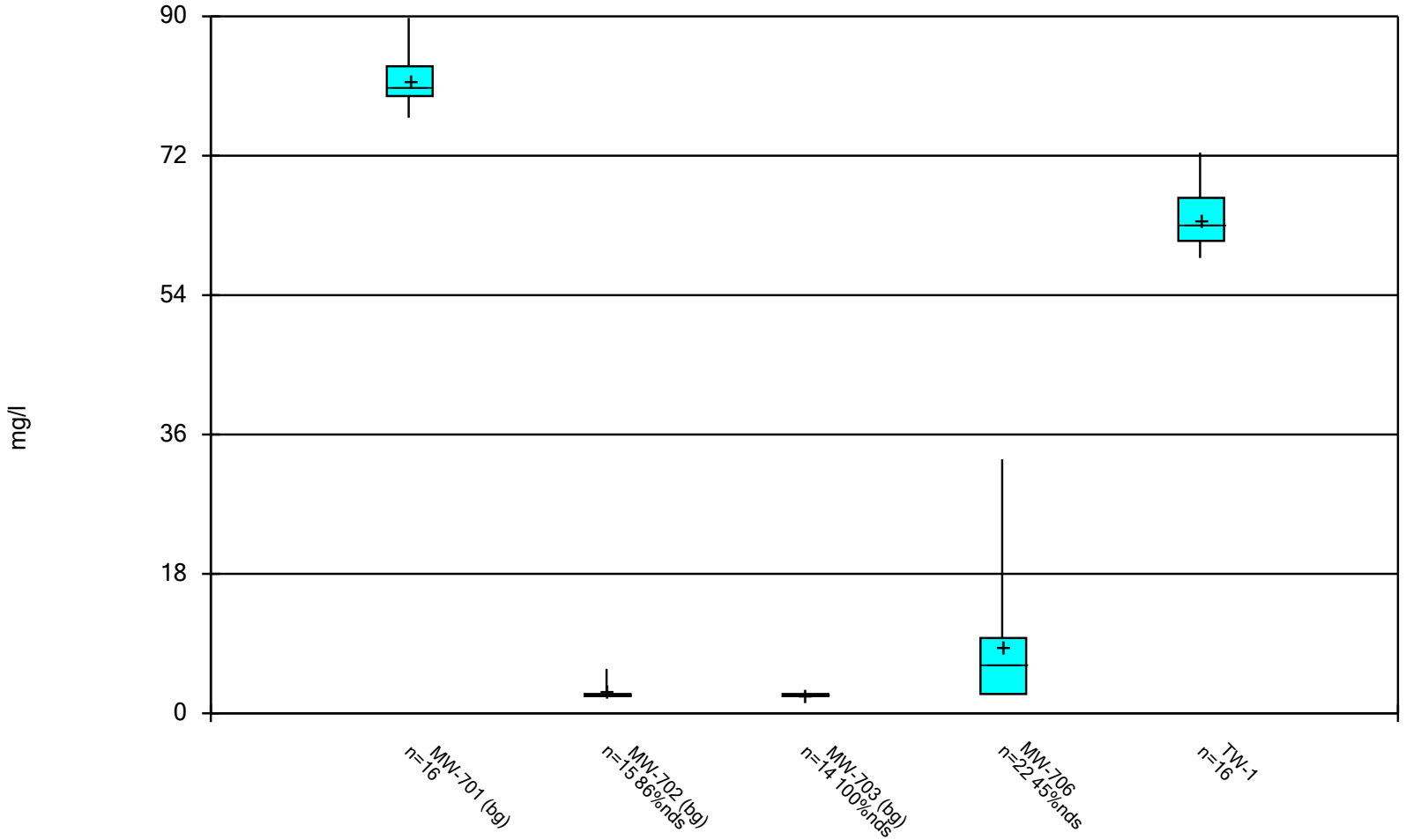
LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 10/8/2020, 8:52 AM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
CHLORIDE (mg/l)	MW-701 (bg)	16	51.01	2.894	0.7236	50.65	46.2	56.5	0
CHLORIDE (mg/l)	MW-702 (bg)	15	44.33	3.41	0.8806	44.9	38	48.5	0
CHLORIDE (mg/l)	MW-703 (bg)	14	101.5	23.05	6.16	107	22.3	115	0
CHLORIDE (mg/l)	MW-704	20	85.48	3.675	0.8218	84.6	80.8	93	0

Box & Whiskers Plot



Constituent: SULFATE Analysis Run 10/8/2020 8:56 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 10/8/2020, 8:58 AM

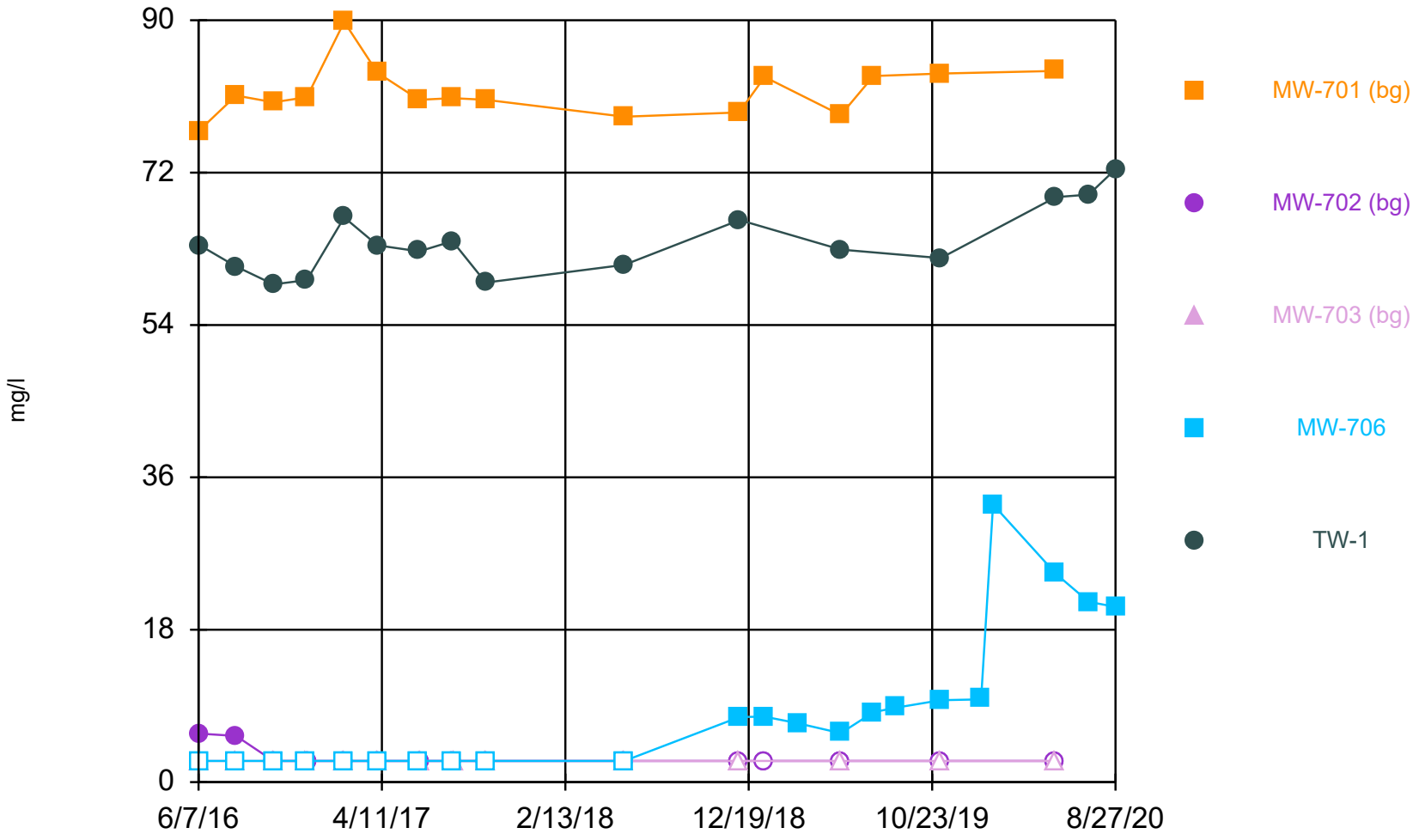
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
SULFATE (mg/l)	MW-701 (bg)	16	81.61	3.04	0.76	80.85	76.9	89.8	0
SULFATE (mg/l)	MW-702 (bg)	15	2.913	1.09	0.2815	2.5	2.5	5.73	86.67
SULFATE (mg/l)	MW-703 (bg)	14	2.5	0	0	2.5	2.5	2.5	100
SULFATE (mg/l)	MW-706	22	8.595	8.553	1.824	6.37	2.5	32.8	45.45
SULFATE (mg/l)	TW-1	16	63.83	3.988	0.9969	63.15	58.8	72.4	0

Appendix C

Time Series Plots

Hollow symbols indicate censored values.

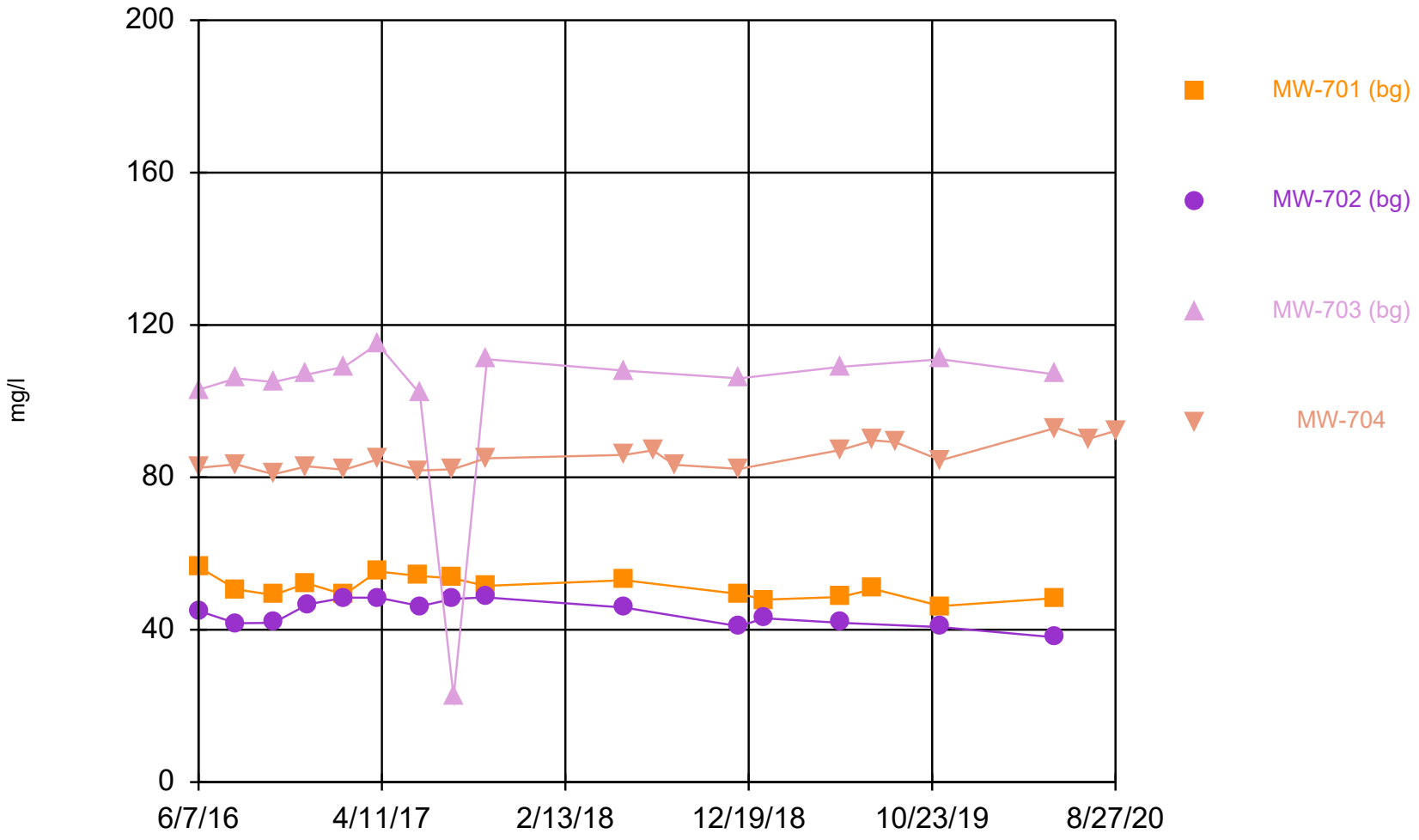
Time Series



Constituent: SULFATE Analysis Run 10/8/2020 8:54 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series



Constituent: CHLORIDE Analysis Run 10/8/2020 8:41 AM View: Upper AQC III

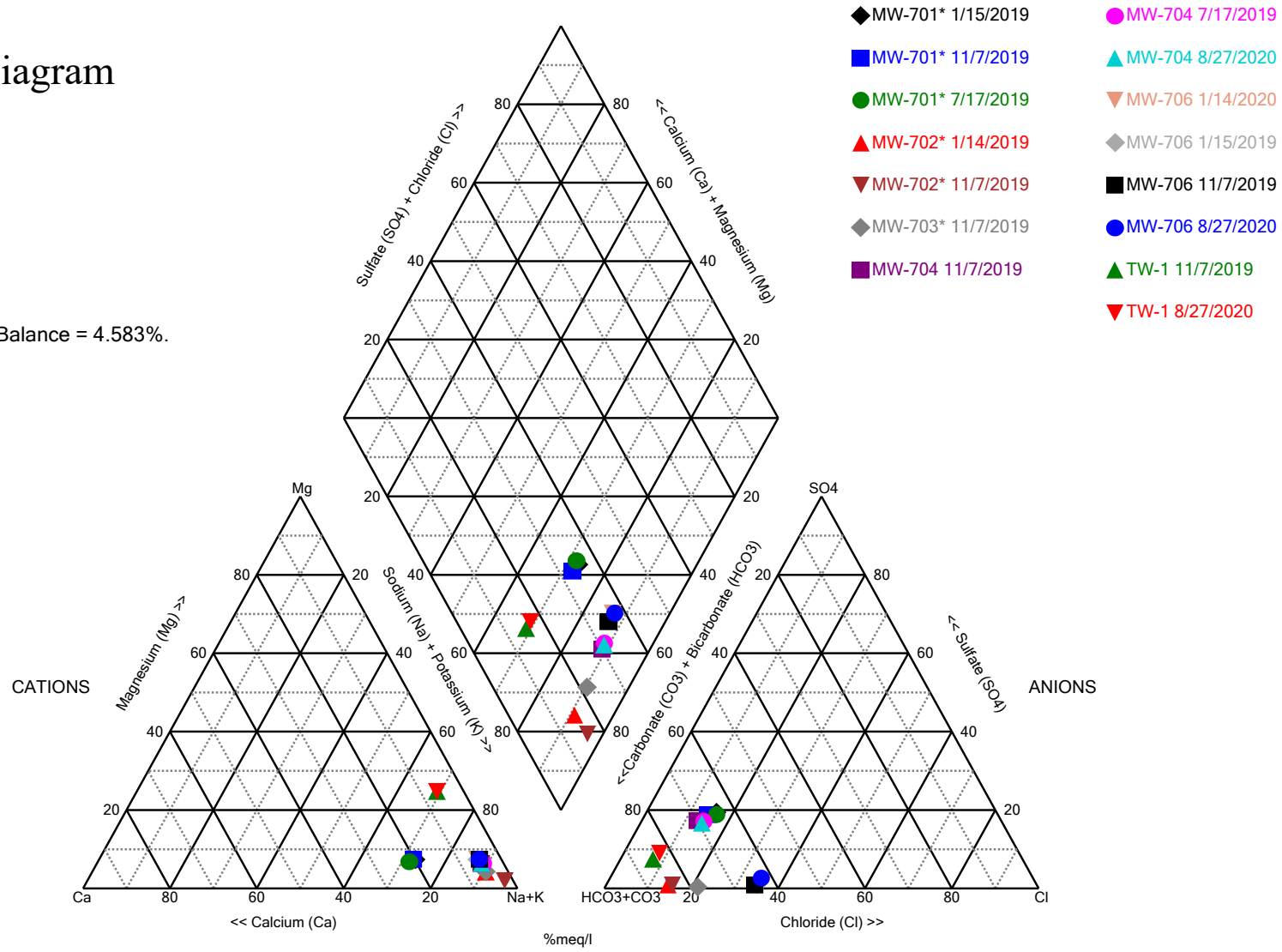
LaCygne Client: SCS Engineers Data: LaC GW Data

Appendix D

Piper Diagram Plots and Analytical Results

Piper Diagram

Cation-Anion Balance = 4.583%.



Analysis Run 10/8/2020 9:00 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Piper Diagram

Analysis Run 10/8/2020 9:02 AM View: Upper AQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
MW-701* 1/15/2019	169	3.11	40.2	8.79	47.9	83.3	336	10
MW-701* 7/17/2019	172	2.91	45	8.71	50.7	83.4	349	10
MW-701* 11/7/2019	163	2.85	40.4	8.6	46.2	83.7	369	10
MW-702* 1/14/2019	230	3.14	11.2	5.24	43	2.5	461	10
MW-702* 11/7/2019	167	2.58	2.73	1.7	40.7	2.5	249	87.9
MW-703* 11/7/2019	339	3.53	17.6	8.07	111	2.5	725	10
MW-704 7/17/2019	442	5.85	21.5	15.8	89.7	156	790	10
MW-704 11/7/2019	429	5.47	21	15.5	84.5	163	844	10
MW-704 8/27/2020	444	5.51	21.8	16.1	92.2	150	803	10
MW-706 1/15/2019	442	6.52	24.7	19.5	238	7.73	769	10
MW-706 11/7/2019	427	6.26	22.5	19	240	9.68	806	10
MW-706 1/14/2020	422	6.18	24.4	19.3	247	9.78	767	10
MW-706 8/27/2020	437	6.25	23	19.4	238	20.7	751	10
TW-1 11/7/2019	286	7.72	23.3	55.4	40.1	61.9	878	10
TW-1 8/27/2020	304	7.61	23.6	58.3	41	72.4	835	10