2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CCR LANDFILL AND LOWER AQC IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:
Evergy Metro, Inc. (f/k/a Kansas City Power & Light Co.)

SCS ENGINEERS

27217233.19 | January 2020

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

CERTIFICATIONS

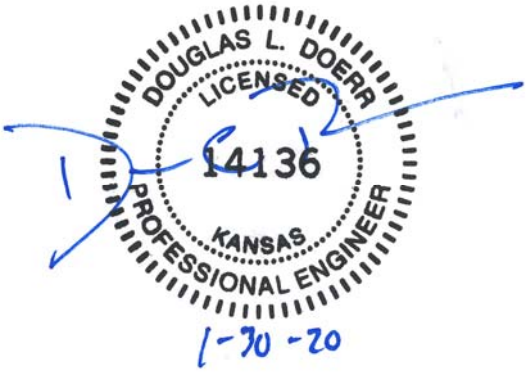
I, John R. Rockhold, being a qualified groundwater scientist and Professional Geologist in the State of Kansas, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station was prepared by 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 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower 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
Digitally signed by Douglas L. Doerr
Date: 2020.01.30 13:37:39 -06'00'



Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions

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Section **Page**

Appendices

1 INTRODUCTION

This 2019 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). Specifically, this report was prepared for Evergy Metro, Inc. (f/k/a Kansas City Power & Light Company) 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 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill and Lower AQC Impoundment at the La Cygne Generating Station.

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 CCR Landfill and Lower AQC Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR Landfill and Lower 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 CCR Landfill and Lower AQC Impoundment in 2019.

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 conducted during the reporting period (2019). Samples collected in 2019 were collected and analyzed for Appendix III detection monitoring constituents as indicated in **Appendix B**, **Table 1** (Appendix III Detection Monitoring Results, and **Table 2** (Detection Monitoring Field Measurements). The dates of sample collection, the monitoring program requiring the sample, and the results of the analyses are also provided in these tables. These tables include Fall 2018 semiannual detection monitoring event verification data taken in 2019; Spring 2019 semiannual detection monitoring data; and the initial Fall 2019 semiannual detection monitoring data.

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 2019. Only detection monitoring was conducted in 2019.

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 2018 verification sampling and analyses per the certified statistical method,

b. completion of the statistical evaluation of the Fall 2018 semiannual detection monitoring sampling and analysis event per the certified statistical method,

c. completion of the 2018 Annual Groundwater Monitoring and Corrective Action Report,

d. completion of a successful alternative source demonstration for the Fall 2018 semiannual detection monitoring sampling and analysis event,

e. completion of the Spring 2019 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,

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

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

h. initiation of the Fall 2019 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 (2020).

Completion of verification sampling and data analysis, and the statistical evaluation of Fall 2019 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:**

C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (June 2019).

C.2. Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (December 2019).

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.

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 CCR Landfill and Lower 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 CCR LANDFILL
AND LOWER AQC IMPOUNDMENT)

MW-601 CCR GROUNDWATER MONITORING SYSTEM WELLS

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
0	-	-
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-

SHEET TITLE
SITE MAP
CCR LANDFILL & LOWER AQC IMPOUNDMENT
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2019 CCR GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT

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. 27217233.19
DSN. BY: TGW
DWN. BY: TGW
CHK. BY: JRR
G/A RVW BY: JRR
PROJ. MGR JRR

CADD FILE:
FIG 1 -LA CYGNE LF LAQC IMP.DWG

DATE:
1/07/20

FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\CCR Annual Report\2018\Fig 1 -La Cygne LF LAQC Imp.dwg Jan 08, 2020 - 10:58am Layout Name: Fig 1 By: 4648jdj

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
CCR Landfill and Lower AQC Impoundment
Appendix III Detection Monitoring Results
Evergy La Cygne Generating Station

Well Number	Sample Date	Appendix III Constituents						
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-10	5/23/2019	0.885	52.9	52.5	0.353	7.32	23.1	588
MW-10	11/7/2019	0.898	56.2	52.2	0.360	7.24	5.64	570
MW-13	1/14/2019	*0.539	---	---	*0.208	**6.87	---	---
MW-13	3/11/2019	*0.470	---	---	*0.194	**7.07	---	---
MW-13	5/23/2019	0.401	355	16.2	0.176	7.03	1520	2460
MW-13	11/7/2019	0.458	340	15.7	0.182	6.79	1450	2430
MW-14R	1/14/2019	*0.859	---	*5.96	---	**7.25	---	---
MW-14R	3/11/2019	*0.591	---	*4.44	---	**7.45	---	---
MW-14R	5/23/2019	0.669	55.2	5.33	0.265	7.35	54.5	563
MW-14R	7/17/2019	---	---	*6.14	---	**7.94	---	---
MW-14R	8/23/2019	---	---	*6.08	---	**7.31	---	---
MW-14R	11/7/2019	0.807	55.8	5.77	0.303	7.20	59.7	509
MW-15	1/14/2019	*0.288	---	---	---	**7.18	---	---
MW-15	5/23/2019	0.228	102	12.0	0.251	7.14	189	748
MW-15	11/7/2019	0.282	104	11.3	0.250	7.03	175	692
MW-601	1/14/2019	---	---	---	---	*7.63	*5.97	---
MW-601	3/11/2019	---	---	---	---	**7.64	*5.89	---
MW-601	5/23/2019	1.85	17.7	162	1.48	7.65	6.76	1000
MW-601	7/17/2019	---	---	---	---	**7.95	*5.75	---
MW-601	8/23/2019	---	---	---	---	**7.66	*6.32	---
MW-601	11/7/2019	1.82	17.2	164	1.55	7.72	6.33	900
MW-602	5/23/2019	2.35	23.1	16.9	1.06	7.45	24.2	615
MW-602	11/7/2019	2.30	24.9	16.6	1.07	7.44	24.5	569

* 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 1
CCR Landfill and Lower AQC Impoundment
Appendix III Detection Monitoring Results
Evergy La Cygne Generating Station

Well Number	Sample Date	Appendix III Constituents						
		Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-801	5/23/2019	2.22	25.1	89.4	0.922	7.40	<5.00	852
MW-801	11/7/2019	2.19	27.5	92.0	0.951	7.63	<5.00	785
MW-802	5/23/2019	2.47	26.4	34.2	0.816	7.30	<5.00	688
MW-802	11/7/2019	2.44	28.0	33.8	0.952	7.58	<5.00	627
MW-803	5/23/2019	2.12	41.1	49.2	0.551	7.26	24.1	621
MW-803	11/7/2019	2.07	43.1	49.4	0.563	7.26	24.0	563
MW-804	1/14/2019	*1.73	---	---	---	**7.07	---	---
MW-804	3/11/2019	*1.74	---	---	---	**7.38	---	---
MW-804	5/23/2019	1.69	66.8	31.7	0.445	7.15	23.2	558
MW-804	7/17/2019	*1.71	---	---	---	**7.31	---	---
MW-804	8/22/2019	*1.63	---	---	---	**7.16	---	---
MW-804	11/7/2019	1.63	68.2	29.0	0.430	7.34	21.9	501
MW-805	1/14/2019	---	*473	---	---	**6.32	---	---
MW-805	3/11/2019	---	*468	---	---	**6.40	---	---
MW-805	5/23/2019	0.582	442	455	0.173	6.44	666	2180
MW-805	7/17/2019	*0.550	---	---	---	**6.48	---	---
MW-805	8/22/2019	*0.537	---	---	---	**6.40	---	---
MW-805	11/7/2019	0.525	475	492	0.130	6.52	730	2070

* 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
CCR Landfill and Lower AQC Impoundment
Detection Monitoring Field Measurements
Evergy La Cygne 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-10	5/23/2019	7.32	1150	20.31	0.00	-143	0.65	2.78	872.17
MW-10	11/7/2019	7.24	895	14.13	0.00	-102	0.35	2.00	872.95
MW-13	1/14/2019	**6.87	2260	10.98	6.30	210	1.78	2.83	874.39
MW-13	3/11/2019	**7.07	2540	13.78	0.90	150	6.07	2.81	874.41
MW-13	5/23/2019	7.03	2900	17.14	0.00	74	1.00	2.58	874.64
MW-13	11/7/2019	6.79	2450	13.68	6.30	41	0.69	3.91	873.31
MW-14R	1/14/2019	**7.25	1080	12.06	4.30	88	1.04	10.60	868.23
MW-14R	3/11/2019	**7.45	911	13.78	8.60	110	4.44	8.93	869.90
MW-14R	5/23/2019	7.35	1040	14.60	0.00	55	7.80	8.03	870.80
MW-14R	7/17/2019	**7.94	989	17.39	0.00	84	0.64	8.33	870.50
MW-14R	8/23/2019	**7.31	922	16.62	0.00	86	0.00	8.75	870.08
MW-14R	11/7/2019	7.20	837	14.09	5.10	-77	1.07	8.07	870.76
MW-15	1/14/2019	**7.18	1290	12.85	0.00	66	1.38	10.20	863.68
MW-15	5/23/2019	7.14	1410	18.19	0.00	102	2.95	9.00	864.88
MW-15	11/7/2019	7.03	1020	14.91	8.20	7	0.94	9.65	864.23
MW-601	1/14/2019	*7.63	1650	9.69	3.40	204	0.00	9.45	869.73
MW-601	3/11/2019	**7.64	1620	13.11	6.20	-24	0.55	9.78	869.40
MW-601	5/23/2019	7.65	1740	15.06	5.80	31	7.50	10.27	868.91
MW-601	7/17/2019	**7.95	1370	26.56	0.00	69	0.43	10.69	868.49
MW-601	8/23/2019	**7.66	1610	17.66	2.60	12	0.00	10.39	868.79
MW-601	11/7/2019	7.72	1820	11.89	4.20	69	1.49	8.90	870.28
MW-602	5/23/2019	7.45	1080	15.69	15.80	65	1.27	3.73	876.16
MW-602	11/7/2019	7.44	866	13.66	20.40	-6	0.85	4.27	875.62

* 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

Table 2
CCR Landfill and Lower 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-801	5/23/2019	7.40	1490	14.52	8.10	-105	0.00	0.47	857.18
MW-801	11/7/2019	7.63	1560	11.54	8.80	9	1.26	0.74	856.91
MW-802	5/23/2019	7.30	1210	16.74	0.00	-125	0.00	0.23	853.24
MW-802	11/7/2019	7.58	1260	12.51	8.20	-30	0.70	0.15	853.32
MW-803	5/23/2019	7.26	1110	14.88	0.00	-48	0.00	8.52	846.48
MW-803	11/7/2019	7.26	912	13.37	6.40	15	1.62	9.72	845.28
MW-804	1/14/2019	**7.07	1050	10.89	1.00	13	1.58	7.46	847.74
MW-804	3/11/2019	**7.38	947	13.02	3.60	105	2.84	7.95	847.25
MW-804	5/23/2019	7.15	1150	17.72	0.00	25	1.97	9.54	845.66
MW-804	7/17/2019	**7.31	930	22.82	0.00	-18	3.90	10.63	844.57
MW-804	8/22/2019	**7.16	920	21.25	0.00	92	0.00	10.81	844.39
MW-804	11/7/2019	7.34	1040	14.35	8.30	4	1.31	8.55	846.65
MW-805	1/14/2019	**6.32	3030	13.54	28.20	159	0.00	5.81	848.82
MW-805	3/11/2019	**6.40	3130	13.08	14.70	87	1.08	5.44	849.19
MW-805	5/23/2019	6.44	3390	17.67	6.10	140	1.96	4.34	850.29
MW-805	7/17/2019	**6.48	2780	26.75	0.00	226	2.90	4.64	849.99
MW-805	8/22/2019	**6.40	3020	20.91	17.50	349	0.00	5.12	849.51
MW-805	11/7/2019	6.52	3360	14.13	1.70	35	1.07	4.89	849.74

* 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

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NTU - Nephelometric Turbidity Unit

Appendix C

Alternative Source Demonstrations

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (June 2019)

C.2. Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (December 2019)

C.1 Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (June 2019)

CCR GROUNDWATER MONITORING

ALTERNATIVE SOURCE DEMONSTRATION REPORT

NOVEMBER 2018 GROUNDWATER MONITORING EVENT

CCR LANDFILL AND LOWER AQC IMPOUNDMENT

LA CYGNE GENERATING STATION

LA CYGNE, KANSAS

Presented To:

Kansas City Power & Light Company

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

(913) 681-0030

June 2019

File No. 27217233.19

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 CCR Landfill and Lower 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 CCR Landfill and Lower 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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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 Landfill and Lower 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 30, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on January 12, 2019, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was a 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, 2019 and March 11, 2019.

The completed statistical evaluation identified four Appendix III constituents above their respective prediction limits in monitoring wells MW-13, MW-601, MW-804, and MW-805.

The prediction limit for boron in monitoring well MW-804 is 1.653 mg/L. The detection monitoring sample was reported at 1.75 mg/L. The first verification re-sample was collected on January 14, 2019 with a result of 1.73 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 1.74 mg/L.

The prediction limit for calcium in monitoring well MW-805 is 448.6 mg/L. The detection monitoring sample was reported at 455 mg/L. The first verification re-sample was collected on January 14, 2019 with a result of 473 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 468 mg/L.

The prediction limit for fluoride in upgradient monitoring well MW-13 is 0.1905 mg/L. The detection monitoring sample was reported at 0.191 mg/L. The first verification re-sample was

collected on January 14, 2019 with a result of 0.208 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 0.194 mg/L.

The prediction limit for sulfate in upgradient monitoring well MW-601 is 5.0 mg/L. The detection monitoring sample was reported at 5.98 mg/L. The first verification re-sample was collected on January 14, 2019 with a result of 5.97 mg/L. The second verification re-sample was collected on March 11, 2019 with a result of 5.89 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring samples for boron from monitoring well MW-804, for calcium from monitoring well MW-805, for fluoride from upgradient monitoring well MW-13, and for sulfate from upgradient monitoring well MW-601 exceed their respective prediction limits and are confirmed statistically significant increases (SSIs) over background.

Determination: A statistical evaluation was completed for all Appendix III detection monitoring constituents in accordance with the certified statistical method. The statistical evaluation identified four SSIs above the background prediction limit for boron in monitoring well MW-804, for calcium in monitoring well MW-805, for fluoride in upgradient monitoring well MW-13, and for sulfate in upgradient monitoring well MW-601.

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 SSIs for the CCR Landfill and Lower 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 CCR Landfill and Lower 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 CCR Landfill and Lower AQC Impoundment at the time of sampling. The groundwater flow directions indicated are for the November 2018 groundwater monitoring event and are typical flow directions for this unit. As seen in the map, monitoring wells MW-13 and MW-601 are located upgradient from the CCR Landfill and Lower AQC Impoundment indicating the SSI for fluoride in MW-13 and the SSI for sulfate in MW-601 are not caused by a release from the CCR Landfill and Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSIs above background levels for fluoride and sulfate, or that the respective SSIs 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 boron for upgradient wells MW-601, MW-602, MW-10, and MW-13 and downgradient well MW-804. Although the boron SSI was only identified in downgradient well MW-804 the box and whiskers plot shows that it is well within the overall boron range for upgradient wells (MW-601, MW-602, MW-10 and MW-13). The comparison indicates the boron levels in upgradient wells MW-601 and MW-602 are greater than the boron level in MW-804. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI above background levels for boron, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

An SSI was identified for calcium in downgradient well MW-805. Box and whiskers plots were prepared for upgradient monitoring wells MW-13 and MW-602 and for downgradient well MW-805. Although the box and whiskers plots show the downgradient calcium concentration in MW-805 is a little higher than that of upgradient well MW-13 and significantly greater than the concentration in MW-602, the significant difference between upgradient wells shown by this plot demonstrates the potential natural variability even between upgradient wells over short distances (MW-13 and MW-602). This large difference in upgradient concentrations over a short distance provides evidence that the background data set is likely not large enough to include the whole naturally occurring population and that the concentration in MW-805 could be in the naturally occurring population.

This premise and additional evaluations are further discussed in Sections 3.4 and 3.5.

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 boron were prepared for the CCR monitoring system upgradient wells MW-601, MW-602, MW-10, and MW-13 and downgradient well MW-804. Although the boron SSI was only identified in downgradient well MW-804, the time series plots show that boron is well within the overall boron range for upgradient wells (MW-601, MW-602, MW-10 and MW-13). The comparison indicates the boron levels in upgradient wells MW-601 and MW-602 are greater than the boron level in MW-804. This demonstrates that a source other than the Landfill or Lower AQC Impoundment caused the boron 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 SEN'S SLOPE/MANN-KENDALL TREND ANALYSIS

Sen's Slope/Mann-Kendall statistical analysis is often used when updating background to provide additional information to determine the appropriate background data set for the intrawell prediction limit analysis. Additionally, Sen's Slope/Mann-Kendall can be used when running routine statistics to

determine if a prediction limit exceedance also exhibits an increasing trend. The analysis can determine if the overall data set exhibits a statistically significant increasing trend over time and can help to determine if updating the background data set is appropriate.

A trend is the general increase or decrease in observed values of a variable over time. A trend analysis can be used to determine the significance of an apparent trend and to estimate the magnitude of that trend. The Mann-Kendall test is nonparametric, meaning that it does not depend on an assumption of a particular underlying distribution. The test uses only the relative magnitude of data rather than actual values. Therefore, missing values are allowed, and values that are recorded as non-detects by the laboratory can still be used in the statistical analysis by assigning values equal to half their detection limits. Sen's Slope is a simple nonparametric procedure developed to estimate the true slope. The advantage of this method over linear regression is that it is not greatly affected by gross data errors or outliers, and can be computed when data are missing.

Sen's Slope/Mann-Kendall statistical analysis was performed on calcium for monitoring well MW-805. The analysis was performed at the 98 percent confidence level (α + 0.01 per tail [upward & downward]) and indicated the overall data set did not exhibit a statistically significant increase trend.

Sen's Slope/Mann-Kendall trend analysis output plots are provided in **Appendix D**.

3.5 MANN-WHITNEY / WILCOXON RANK SUM

The Mann-Whitney test, also known as Wilcoxon Rank Sum, may be used to test whether the measurements from one population are significantly higher or lower than another population. This test is often used when updating background data sets. It compares the background data set to the data planned to be added to the background data set.

Based on previous discussions of the existing background data set for calcium not necessarily representing the entire population of naturally occurring calcium (true background), the Mann-Whitney test was performed for calcium for upgradient monitoring well MW-13 and downgradient well MW-805. Typically, if the background median and the compliance median (in this case the data planned to be added to the background data set) are not significantly different, than the compliance data can be added to create a new background data set.

The results of the Mann-Whitney test indicate that the calcium background data set for MW-13 and MW-805 did not differ significantly from the new data (3 points for MW-13 and 4 points for MW-805) at an α of 0.01. Therefore, this further substantiates that the limited background data sets are not representative of the entire population of naturally occurring calcium. Furthermore, it is advisable to update the background data set with the new data to better represent the entire naturally occurring calcium population for the purposes of this ASD.

Mann-Whitney test outputs are provided in **Appendix E.**

3.6 PREDICTION LIMIT WITH UPDATED BACKGROUND

Based on the Sen's Slope/Mann-Kendall statistical analysis discussed above, there is not a statistically significant increasing trend for calcium in MW-805. As such, the limited background data set (8 points) is not believed to accurately represent the entire population of naturally occurring calcium. Furthermore, the Mann-Whitney test indicates that the median of the next four data points is not significantly different from the median of the background data set for calcium for MW-805. Therefore, the background data set for calcium for MW-805 was updated with the four additional data

points and prediction limit testing was performed using the new background data set. The prediction limit testing with the updated background data set did not identify the November 2018 calcium concentration in MW-805 or the two retesting sample levels (January 2019 and March 2019) as SSIs over background. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the initial SSI above background levels for calcium in MW-805, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

Prediction limit test outputs are provided in **Appendix F**.

3.7 PIPER 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-13 and MW-601 and from downgradient well MW-805. The sample from downgradient well MW-805 plots near the samples from upgradient well MW-13. The samples are in the same hydrochemical facies indicating similar geochemical characteristics between an upgradient well and a downgradient well. Additionally of note, upgradient well MW-601 plots in a totally different hydrochemical facies indicating that significant natural variability occurs between relatively close upgradient wells and is likely to occur across the site. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI for calcium in MW-805, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

The piper diagram plots are provided in **Appendix G**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSIs for boron, calcium, fluoride and sulfate, or that the SSIs 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 CCR Landfill and Lower AQC Impoundment may continue with the detection monitoring program under § 257.94.

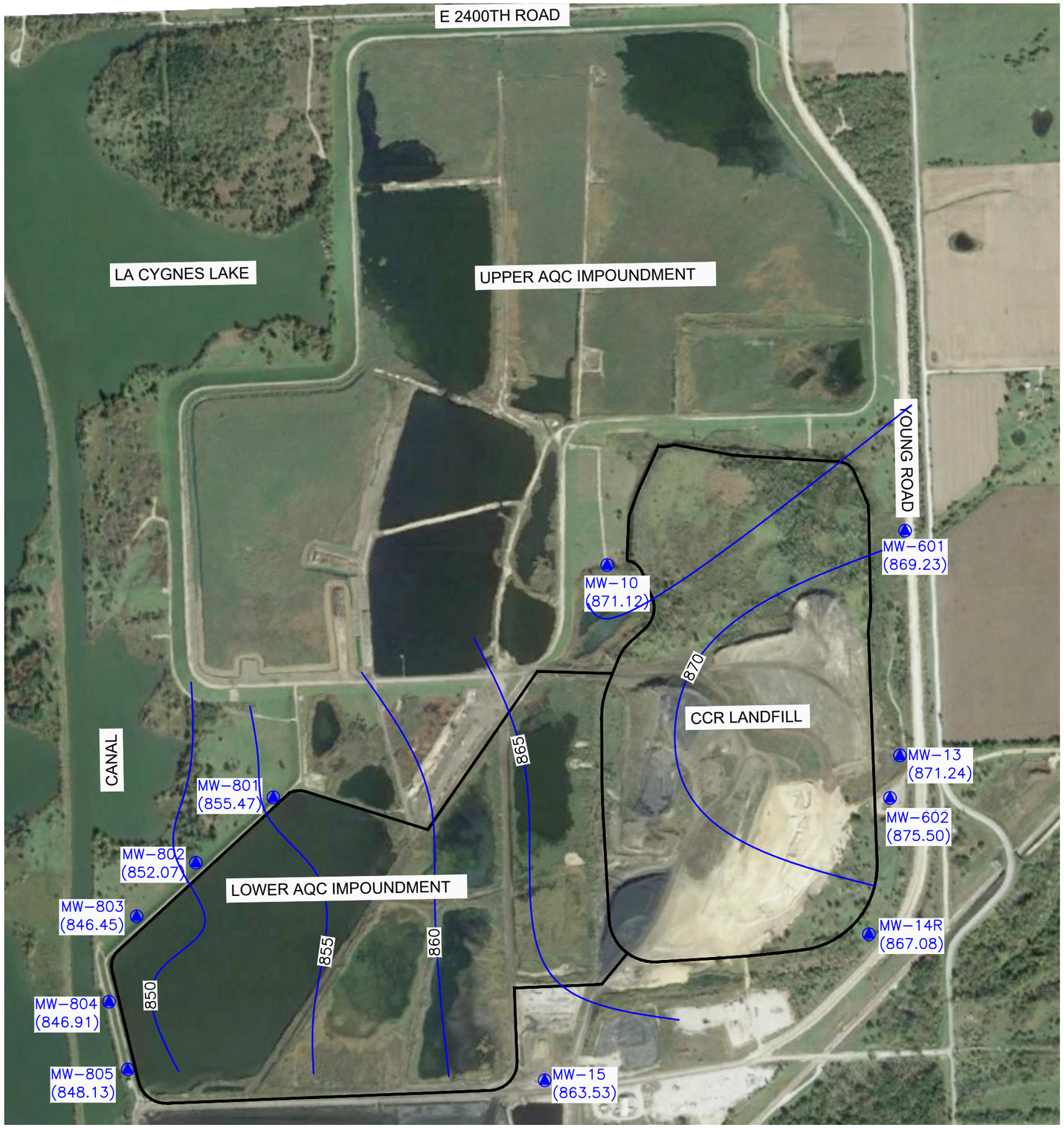
5 GENERAL COMMENTS

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 KCP&L 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 represent 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 signature. 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 CCR LANDFILL AND LOWER AQC IMPOUNDMENT)
- MW-601 (868.92) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- —875— GROUNDWATER SURFACE ELEVATIONS (REPRESENTATIVE FOR THIS UNIT)

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.

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SCALE FEET

REV.	DATE	CK. BY
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1	-	-
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SHEET TITLE
POTENTIOMETRIC SURFACE MAP (NOVEMBER 2018)
CCR LANDFILL & LOWER AQC IMPOUNDMENT

PROJECT TITLE
ALTERNATIVE SOURCE DEMONSTRATION

CLIENT
KANSAS CITY POWER & LIGHT COMPANY
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 RVW BY:
27217233.18	TGW	JRR
DSN. BY:	CHK. BY:	PROJ. MGR
TGW	JRR	JRR

CADD FILE:
LA CYGNE LF LAQC IMP & UAQC FIG 1_COMBINED.DWG

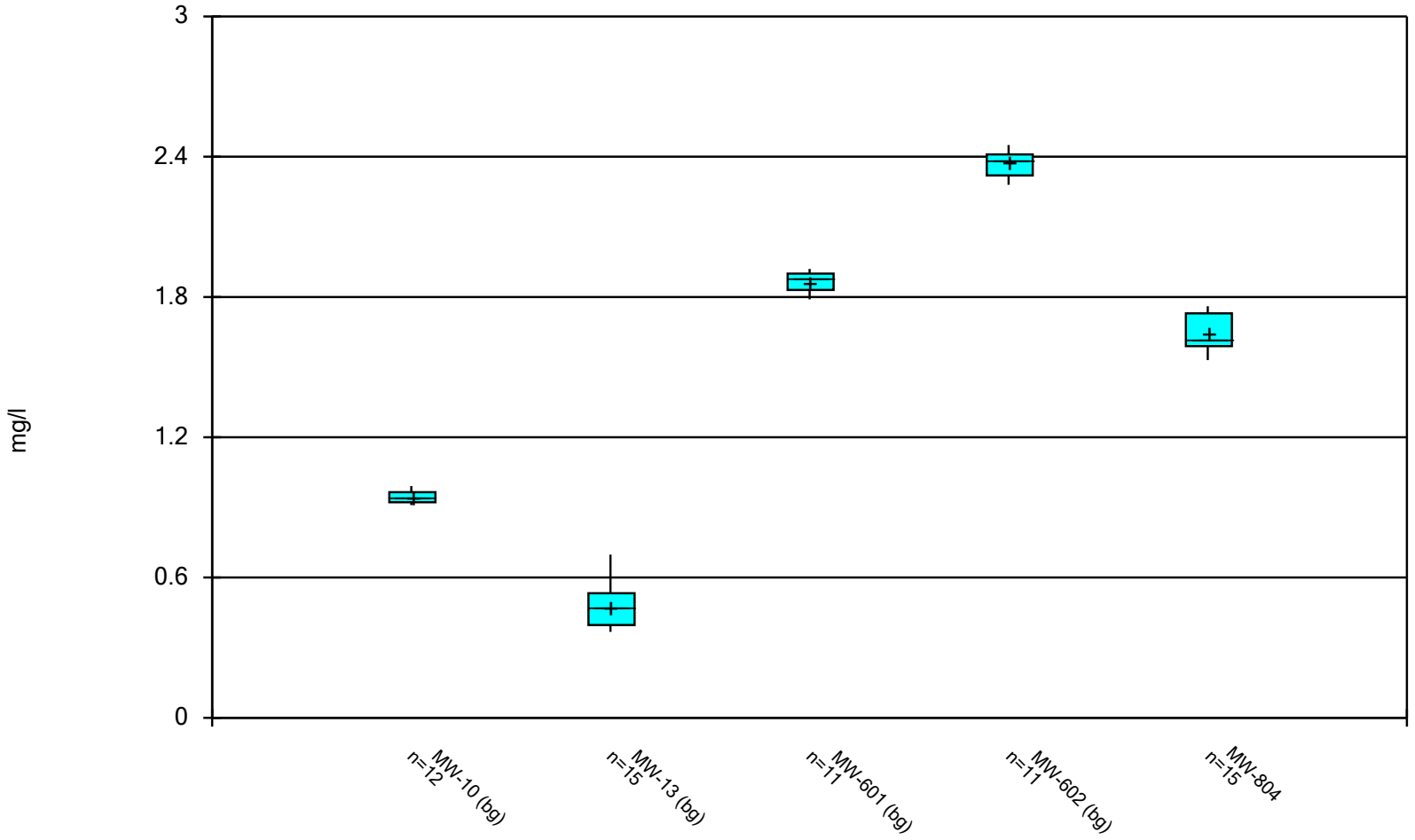
DATE:
5/22/19

FIGURE NO.
1

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: BORON Analysis Run 4/3/2019 5:08 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

Constituent: BORON (mg/l) Analysis Run 4/3/2019 5:09 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

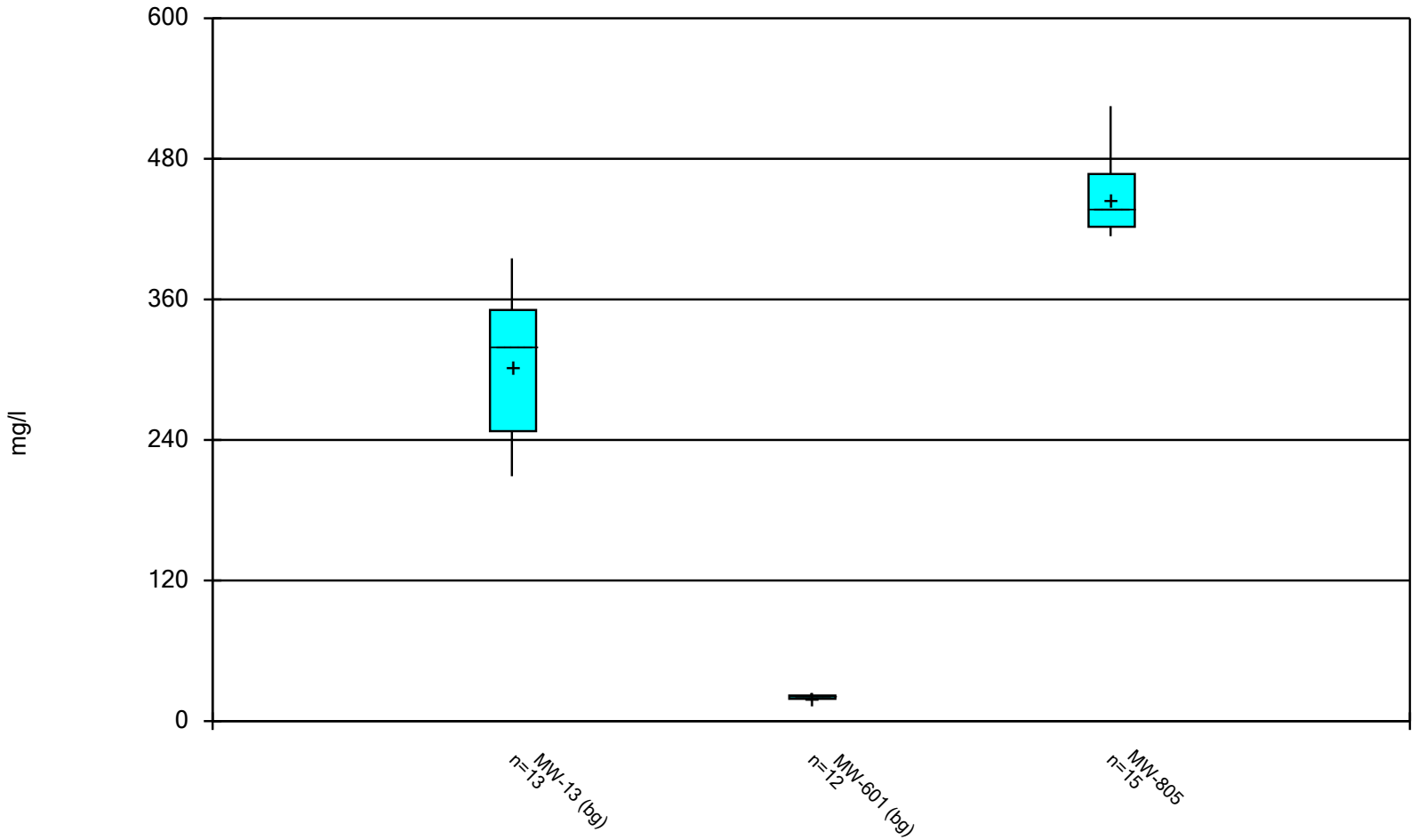
	MW-10 (bg)	MW-13 (bg)	MW-601 (bg)	MW-602 (bg)	MW-804
6/6/2016	0.923				
6/8/2016					1.65
6/9/2016		0.375	1.79		
6/10/2016				2.28	
8/9/2016			1.91	2.39	
8/10/2016					1.58
8/11/2016	0.966	0.397			
10/11/2016					1.59
10/12/2016	0.964				
10/13/2016		0.381	1.81	2.39	
12/7/2016			1.92		1.62
12/9/2016	0.94			2.34	
12/13/2016		0.403			
2/7/2017					1.59
2/8/2017	0.966		1.88	2.41	
2/10/2017		0.483			
4/4/2017					1.59
4/6/2017	0.933	0.449	1.89		
4/7/2017				2.44	
6/13/2017					1.57
6/15/2017	0.942	0.368	1.85	2.41	
8/8/2017		0.422			1.61
8/9/2017			1.9		
8/10/2017	0.921			2.45	
10/4/2017	0.991				
10/5/2017		0.47		2.31	1.53
10/6/2017			1.83		
12/12/2017	0.961				
5/23/2018	0.91	0.57	1.88	2.39	1.72
7/11/2018		0.533			1.67
8/16/2018		0.513			1.76
11/30/2018	0.914	0.698	1.85	2.32	1.75
1/14/2019		0.539			1.73
3/11/2019		0.47			1.74
Median	0.941	0.47	1.88	2.39	1.62
LowerQ.	0.922	0.397	1.83	2.32	1.59
UpperQ.	0.965	0.533	1.9	2.41	1.73
Min	0.91	0.368	1.79	2.28	1.53
Max	0.991	0.698	1.92	2.45	1.76
Mean	0.9443	0.4714	1.865	2.375	1.647

Box & Whiskers Plot

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 4/3/2019, 5:09 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
BORON (mg/l)	MW-10 (bg)	12	0.9443	0.02528	0.007299	0.941	0.91	0.991	0
BORON (mg/l)	MW-13 (bg)	15	0.4714	0.08969	0.02316	0.47	0.368	0.698	0
BORON (mg/l)	MW-601 (bg)	11	1.865	0.04204	0.01268	1.88	1.79	1.92	0
BORON (mg/l)	MW-602 (bg)	11	2.375	0.0552	0.01664	2.39	2.28	2.45	0
BORON (mg/l)	MW-804	15	1.647	0.07594	0.01961	1.62	1.53	1.76	0

Box & Whiskers Plot



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LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

Constituent: CALCIUM (mg/l) Analysis Run 5/21/2019 2:18 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-13 (bg)	MW-601 (bg)	MW-805
6/7/2016			422
6/9/2016	363	21.7	
8/9/2016		20.3	
8/10/2016			437
8/11/2016	371		
10/11/2016			422
10/13/2016	395	23.9	
12/6/2016			422
12/7/2016		22.5	
12/13/2016	336		
2/6/2017			435
2/8/2017		20.1	
2/10/2017	297		
4/4/2017			444
4/6/2017	320	21.3	
6/13/2017			430
6/15/2017	339	22	
8/8/2017	319		414
8/9/2017		20.9	
10/5/2017	274		467
10/6/2017		21.1	
12/12/2017			525
1/9/2018			439
5/23/2018	248	17.6	434
9/17/2018	214		
11/30/2018	209	17.5	455
1/14/2019	247	17.9	473
3/11/2019			468
Median	319	21	437
LowerQ.	247.5	19	422
UpperQ.	351	21.85	467
Min	209	17.5	414
Max	395	23.9	525
Mean	302.5	20.57	445.8

Box & Whiskers Plot

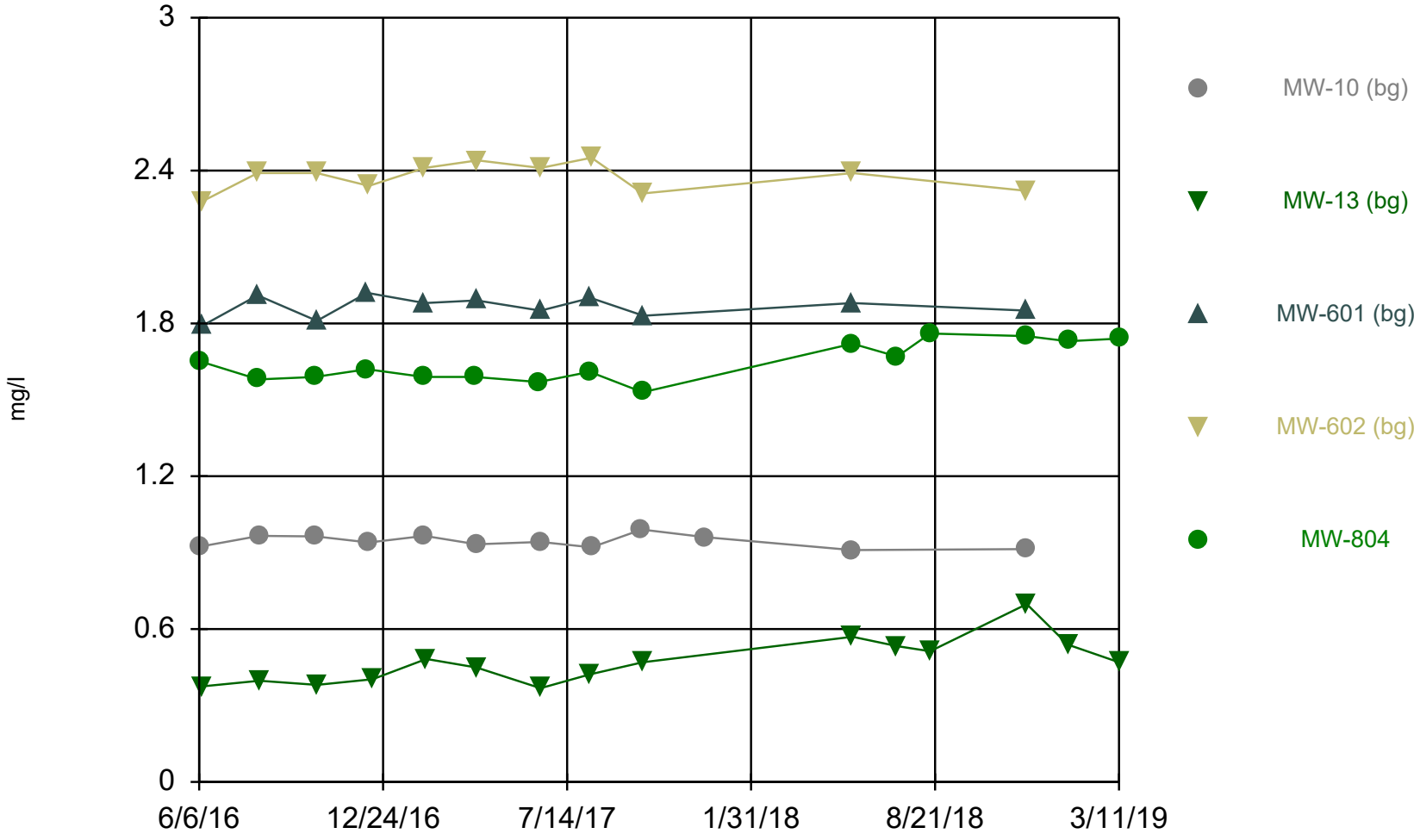
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 5/21/2019, 2:18 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
CALCIUM (mg/l)	MW-13 (bg)	13	302.5	60.15	16.68	319	209	395	0
CALCIUM (mg/l)	MW-601 (bg)	12	20.57	2.016	0.5821	21	17.5	23.9	0
CALCIUM (mg/l)	MW-805	15	445.8	28.51	7.362	437	414	525	0

Appendix C

Time Series Plots

Time Series



Constituent: BORON Analysis Run 4/3/2019 5:09 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: BORON (mg/l) Analysis Run 4/3/2019 5:10 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

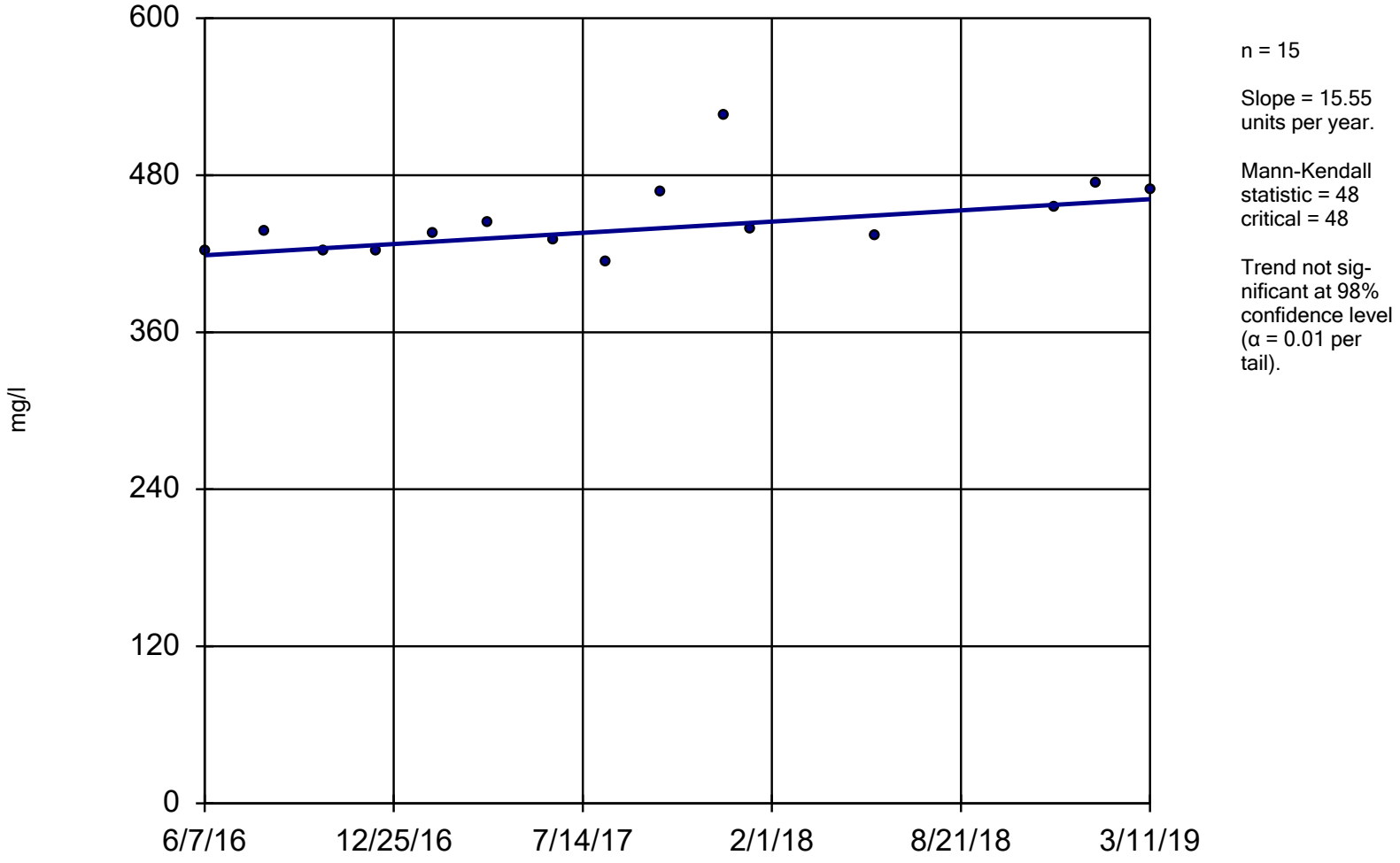
	MW-10 (bg)	MW-13 (bg)	MW-601 (bg)	MW-602 (bg)	MW-804
6/6/2016	0.923				
6/8/2016					1.65
6/9/2016		0.375	1.79		
6/10/2016				2.28	
8/9/2016			1.91	2.39	
8/10/2016					1.58
8/11/2016	0.966	0.397			
10/11/2016					1.59
10/12/2016	0.964				
10/13/2016		0.381	1.81	2.39	
12/7/2016			1.92		1.62
12/9/2016	0.94			2.34	
12/13/2016		0.403			
2/7/2017					1.59
2/8/2017	0.966		1.88	2.41	
2/10/2017		0.483			
4/4/2017					1.59
4/6/2017	0.933	0.449	1.89		
4/7/2017				2.44	
6/13/2017					1.57
6/15/2017	0.942	0.368	1.85	2.41	
8/8/2017		0.422			1.61
8/9/2017			1.9		
8/10/2017	0.921			2.45	
10/4/2017	0.991				
10/5/2017		0.47		2.31	1.53
10/6/2017			1.83		
12/12/2017	0.961				
5/23/2018	0.91	0.57	1.88	2.39	1.72
7/11/2018		0.533			1.67
8/16/2018		0.513			1.76
11/30/2018	0.914	0.698	1.85	2.32	1.75
1/14/2019		0.539			1.73
3/11/2019		0.47			1.74

Appendix D

Sen's Slope/Mann-Kendal Trend Analysis

Sen's Slope Estimator

MW-805



n = 15

Slope = 15.55 units per year.

Mann-Kendall statistic = 48
critical = 48

Trend not significant at 98% confidence level (α = 0.01 per tail).

Constituent: CALCIUM Analysis Run 5/16/2019 3:44 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Sen's Slope Estimator

Constituent: CALCIUM (mg/l) Analysis Run 5/16/2019 3:47 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-805
6/7/2016	422
8/10/2016	437
10/11/2016	422
12/6/2016	422
2/6/2017	435
4/4/2017	444
6/13/2017	430
8/8/2017	414
10/5/2017	467
12/12/2017	525
1/9/2018	439
5/23/2018	434
11/30/2018	455
1/14/2019	473
3/11/2019	468

Trend Test

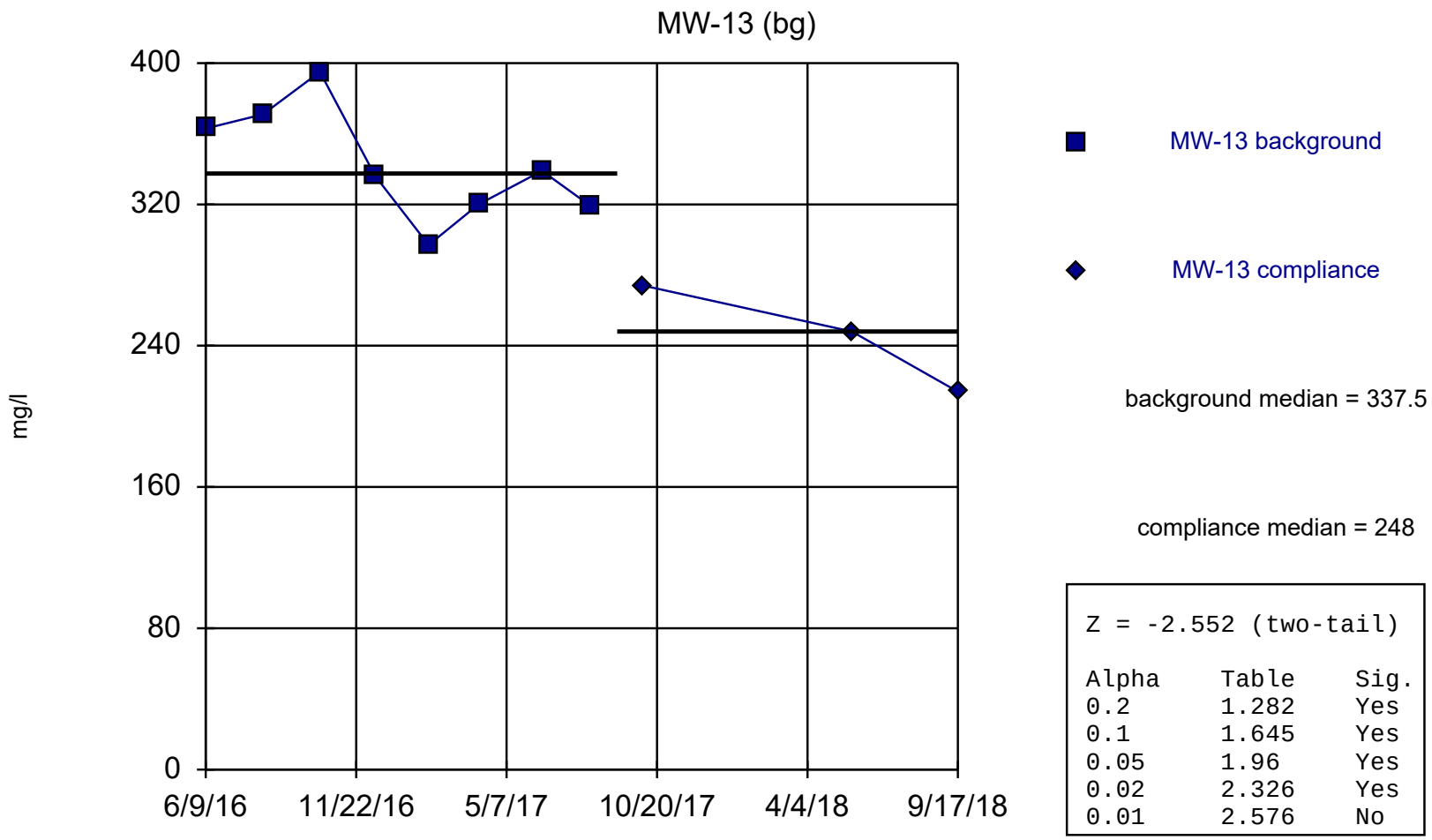
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 5/16/2019, 3:47 PM

Constituent	Well	Slope	Calc.	Critical	Sig.	N	%NDs	Normality	Xform	Alpha	Method
CALCIUM (mg/l)	MW-805	15.55	48	48	No	15	0	n/a	n/a	0.02	NP

Appendix E

Mann-Whitney Test Outputs

Mann-Whitney (Wilcoxon Rank Sum)



Z = -2.552 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	Yes
0.01	2.576	No

Constituent: CALCIUM Analysis Run 5/22/2019 12:30 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

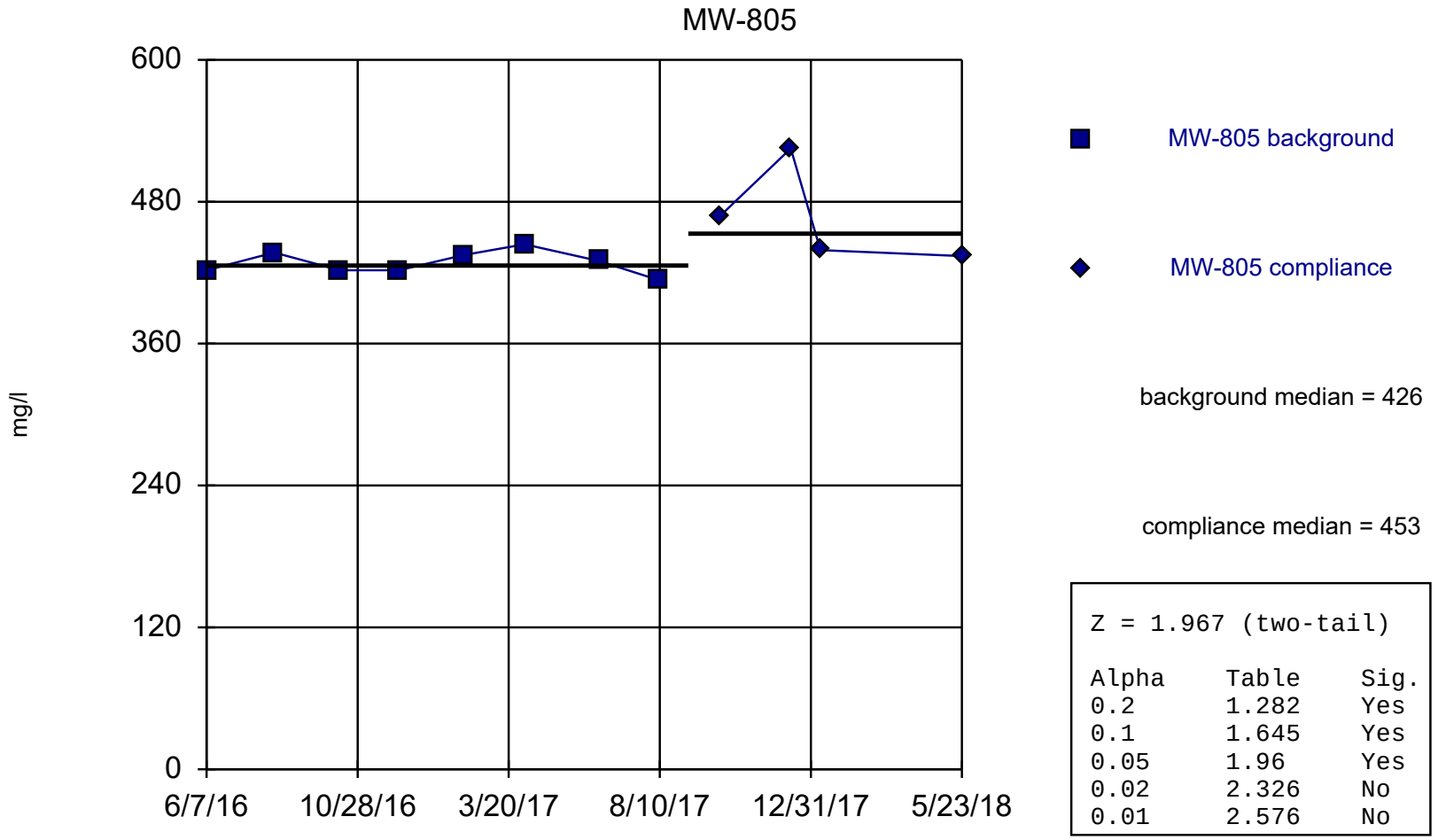
Mann-Whitney (Wilcoxon Rank Sum)

Constituent: CALCIUM (mg/l) Analysis Run 5/22/2019 12:33 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-13	MW-13
6/9/2016	363	
8/11/2016	371	
10/13/2016	395	
12/13/2016	336	
2/10/2017	297	
4/6/2017	320	
6/15/2017	339	
8/8/2017	319	
10/5/2017		274
5/23/2018		248
9/17/2018		214

Mann-Whitney (Wilcoxon Rank Sum)



Z = 1.967 (two-tail)

Alpha	Table	Sig.
0.2	1.282	Yes
0.1	1.645	Yes
0.05	1.96	Yes
0.02	2.326	No
0.01	2.576	No

Constituent: CALCIUM Analysis Run 5/22/2019 12:30 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Mann-Whitney (Wilcoxon Rank Sum)

Constituent: CALCIUM (mg/l) Analysis Run 5/22/2019 12:33 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-805	MW-805
6/7/2016	422	
8/10/2016	437	
10/11/2016	422	
12/6/2016	422	
2/6/2017	435	
4/4/2017	444	
6/13/2017	430	
8/8/2017	414	
10/5/2017		467
12/12/2017		525
1/9/2018		439
5/23/2018		434

Welch's t-test/Mann-Whitney

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 5/22/2019, 12:33 PM

Constituent	Well	Calc.	0.1	0.05	0.025	0.01	Method
CALCIUM (mg/l)	**MW-13 (bg)**	**-2.552**	**Yes**	**Yes**	**Yes**	**No**	**Mann-W**
CALCIUM (mg/l)	MW-805	1.967	Yes	Yes	No	No	Mann-W

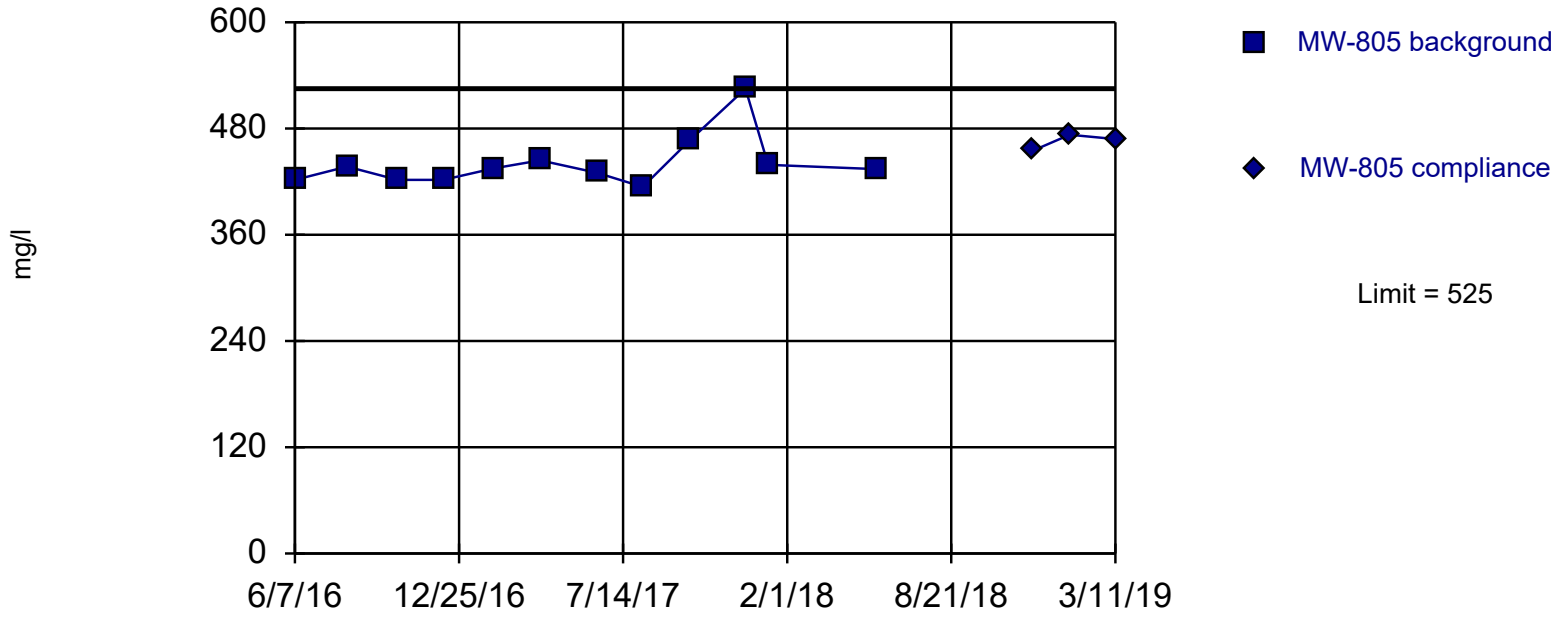
Appendix F

Prediction Limit with Updated Background

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 12 background values. Well-constituent pair annual alpha = 0.004342. Individual comparison alpha = 0.002173 (1 of 3). Seasonality was not detected with 95% confidence.

Constituent: CALCIUM Analysis Run 5/17/2019 11:25 AM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 5/17/2019 11:29 AM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-805	MW-805
6/7/2016	422	
8/10/2016	437	
10/11/2016	422	
12/6/2016	422	
2/6/2017	435	
4/4/2017	444	
6/13/2017	430	
8/8/2017	414	
10/5/2017	467	
12/12/2017	525	
1/9/2018	439	
5/23/2018	434	
11/30/2018		455
1/14/2019		473
3/11/2019		468

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 5/17/2019, 11:29 AM

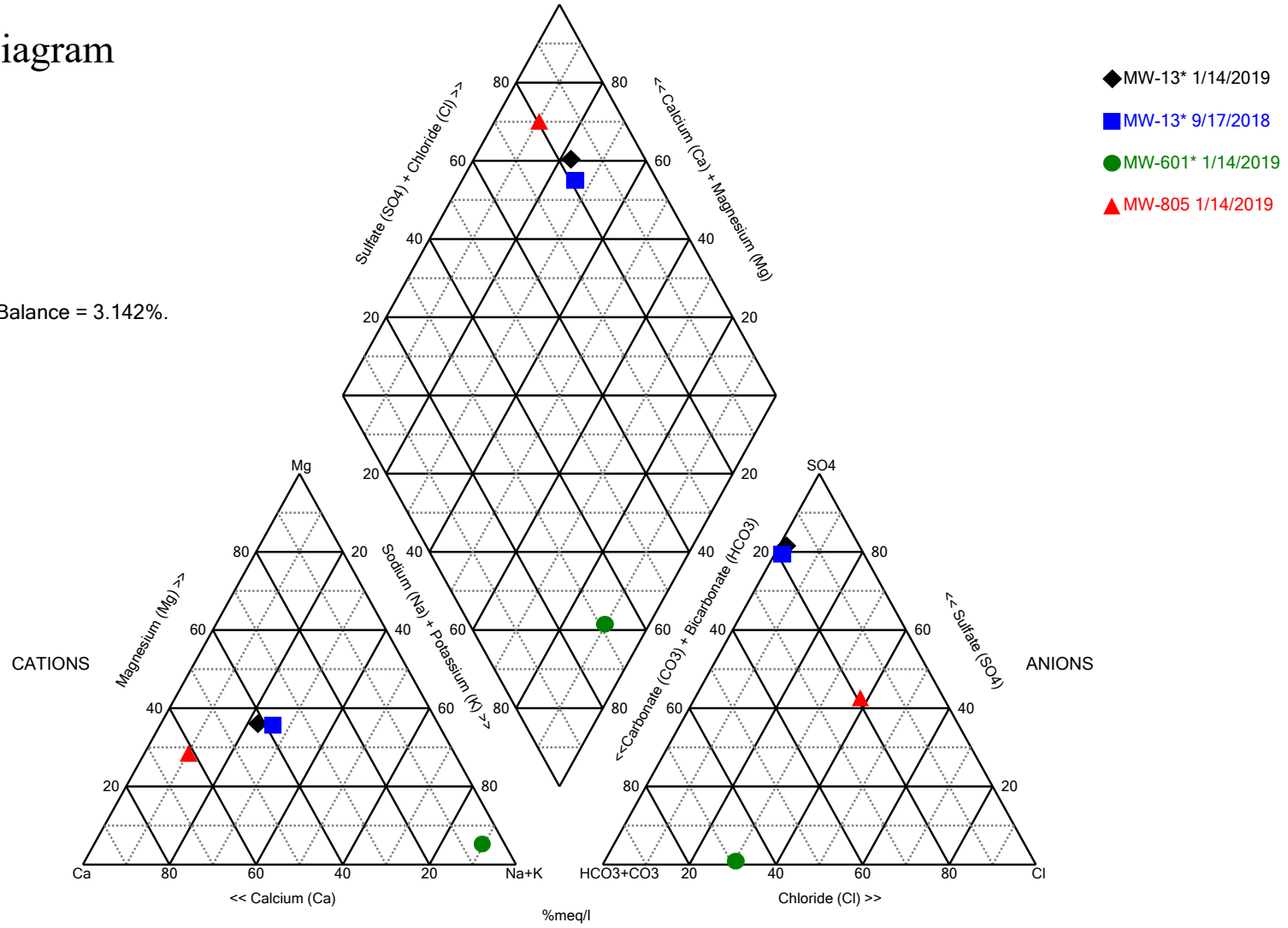
Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
CALCIUM (mg/l)	MW-805	525	n/a	3/11/2019	468	No	12	0	n/a	0.002173	NP Intra (normality) ...

Appendix G

Piper Plots

Piper Diagram

Cation-Anion Balance = 3.142%.



Analysis Run 5/22/2019 12:58 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Piper Diagram

Analysis Run 5/22/2019 12:59 PM View: LF LAQC III

LaCygne Client: SCS Engineers Data: LaC GW Data

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
MW-13* 9/17/2018	165	3.55	214	120	13.1	1010	295	10
MW-13* 1/14/2019	151	3.3	247	128	12.5	1120	289	10
MW-601* 1/14/2019	361	4.21	17.9	10.9	157	5.97	626	10
MW-805 1/14/2019	90.2	2.31	473	133	477	735	425	10

C.2. Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill and Lower AQC Impoundment, La Cygne Generating Station (December 2019)

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

CCR LANDFILL AND LOWER 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 2019

File No. 27217233.19

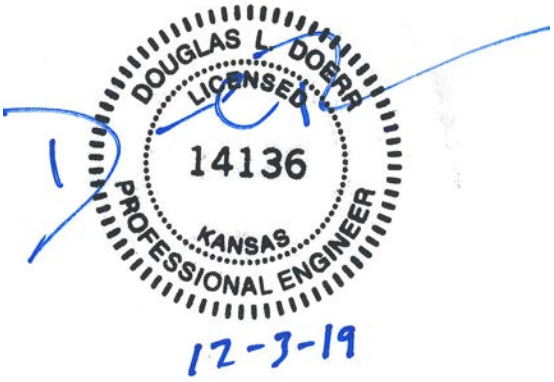
CERTIFICATIONS

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 CCR Landfill and Lower 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 CCR Landfill and Lower 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

Table of Contents

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 Landfill and Lower 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 23, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 5, 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 July 17, 2019 and August 23, 2019.

The completed statistical evaluation identified two Appendix III constituents above their respective prediction limit in monitoring wells MW-601 and MW-14R.

Constituent/Monitoring Well	*UPL	Observation May 23, 2019	1st Verification July 17, 2019	2nd Verification August 23, 2019
Sulfate				
MW-601	5	6.76	5.75	6.32
Chloride				
MW-14R	5.237	5.33	6.14	6.08

*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 confirmed two SSIs above the background prediction limits. These include sulfate in upgradient monitoring well MW-601 and chloride in monitoring well MW-14R.

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 SSIs for the CCR Landfill and Lower 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 CCR Landfill and Lower 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 CCR Landfill and Lower AQC Impoundment at the time of sampling. The groundwater flow directions indicated are for the May 2019 groundwater monitoring event and are typical flow directions for this unit. As seen in the map, monitoring wells MW-14R and MW-601 are located upgradient or cross-gradient from the CCR Landfill and Lower AQC Impoundment indicating the SSI for chloride in MW-14R and the SSI for sulfate in MW-601 are not caused by a release from the CCR Landfill and Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSIs above background levels for chloride and sulfate, or that the respective SSIs 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 and sulfate for upgradient wells MW-601, MW-602, MW-10, and MW-13 and cross-downgradient well MW-14R. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The sulfate concentrations in the other upgradient wells are greater than the concentration in upgradient well MW-601. The comparison indicates the chloride concentration in MW-14R and the sulfate concentration in MW-601 are not caused by the CCR Landfill or the Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI above background levels for chloride and 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 and sulfate were prepared for the CCR monitoring system upgradient wells MW-601, MW-602, MW-10, and MW-13 and cross-downgradient well MW-14R. The chloride concentrations in the upgradient wells are greater than the chloride concentration in monitoring well MW-14R. The sulfate concentrations in the other upgradient wells are greater than the concentration in upgradient well MW-601. The comparison indicates the chloride concentration in MW-14R and the sulfate concentration in MW-601 are not caused by the CCR Landfill or the Lower AQC Impoundment. This demonstrates that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSI above background levels for chloride and sulfate, 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**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the CCR Landfill and Lower AQC Impoundment caused the SSIs for chloride and sulfate, or that the SSIs 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 CCR Landfill and Lower AQC Impoundment may continue with the detection monitoring program under § 257.94.

5 GENERAL COMMENTS

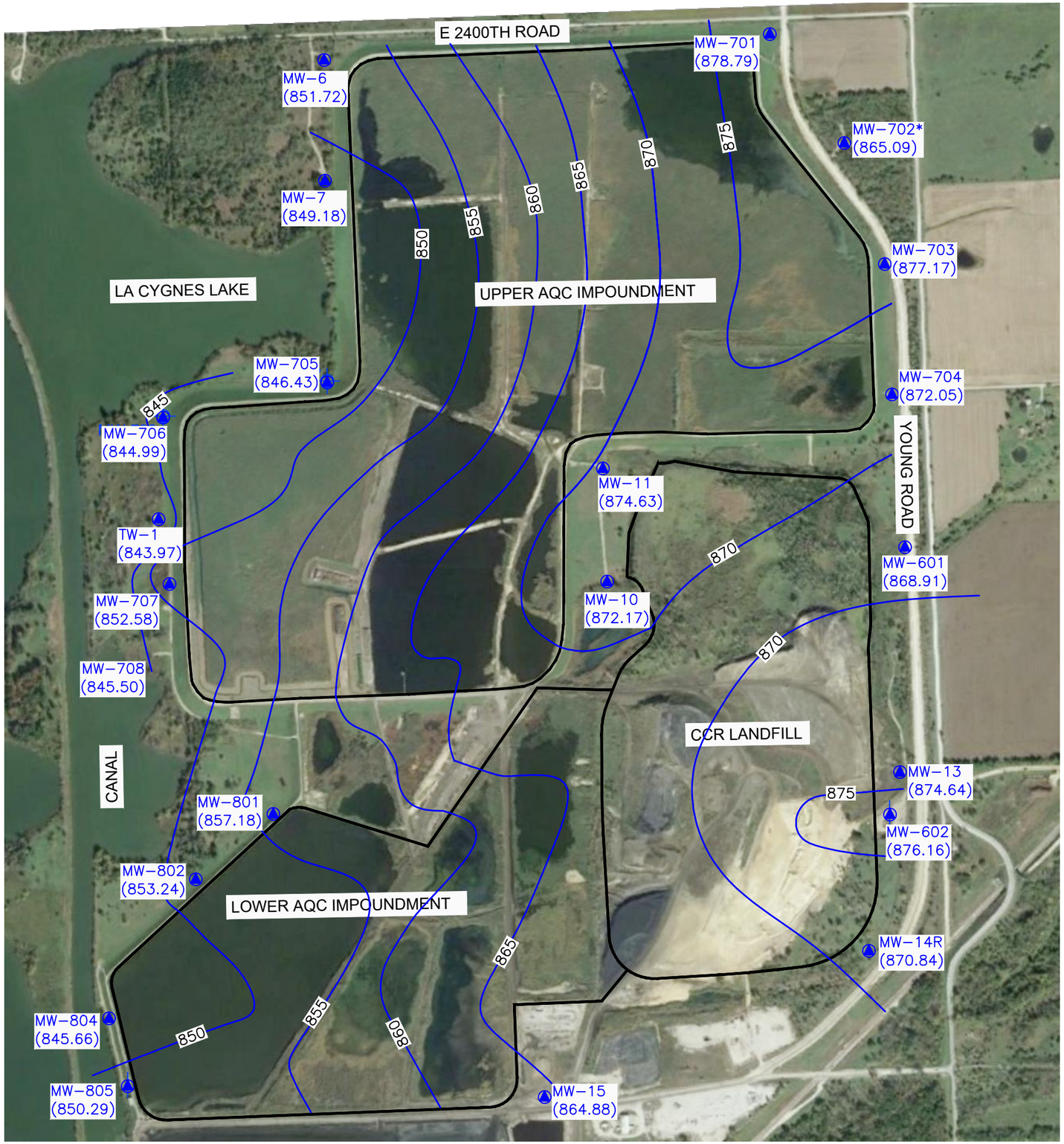
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report. 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 represent 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 signature. 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.

N

800 0 800 1600

SCALE FEET

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

SHEET TITLE: POTENTIOMETRIC SURFACE MAP (MAY 2019) COMBINED AQC IMPOUNDMENT & LF

PROJECT TITLE: ALTERNATIVE SOURCE DEMONSTRATION

CLIENT: KANSAS CITY POWER & LIGHT COMPANY
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.	DSN. BY:	CHK. BY:	O/A RVW BY:
27217233.00	DAW	JF	JRR
DSN. BY:			PROJ. MGR
DAW			JRR

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

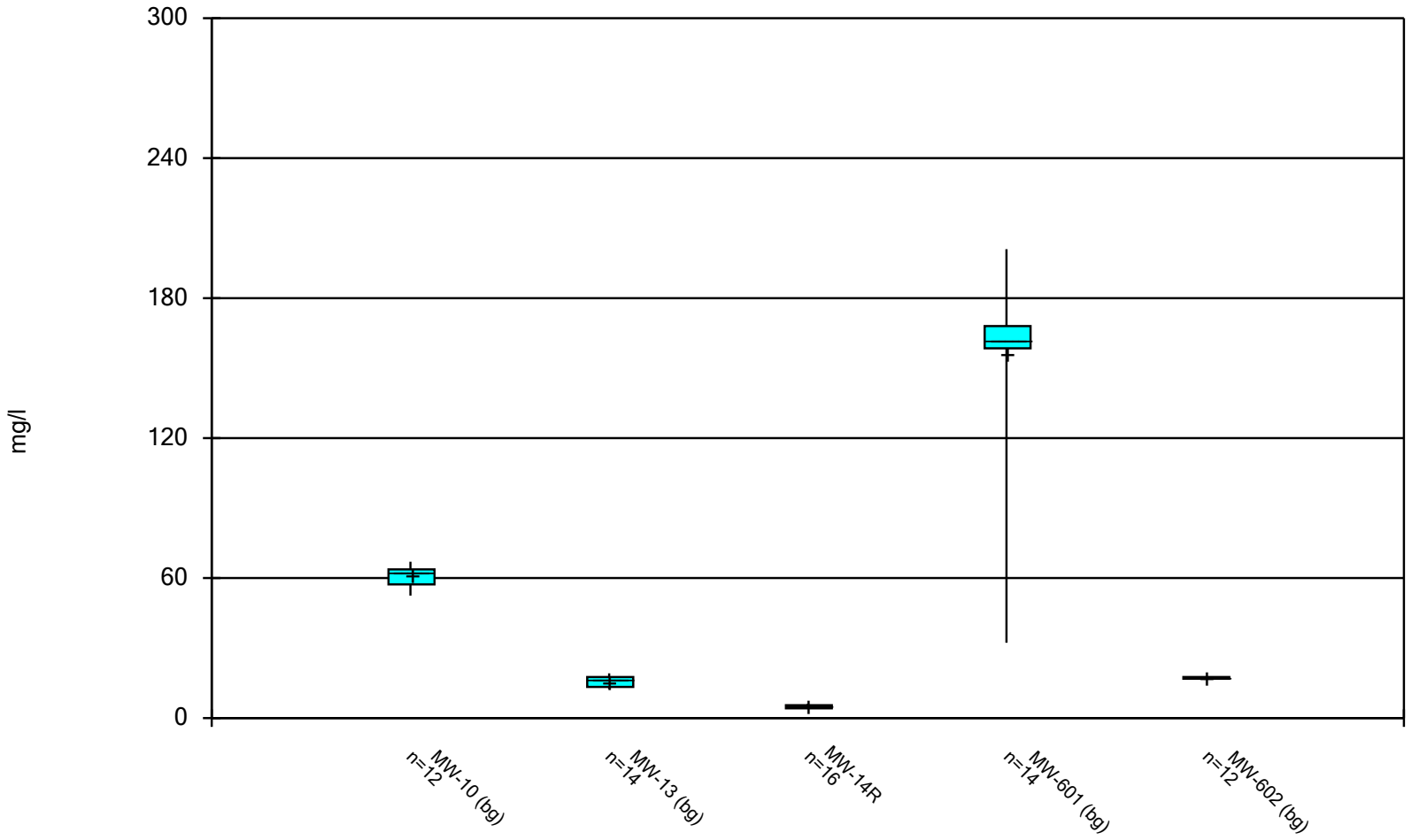
DATE: 11/1/19

FIGURE NO. 1

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: CHLORIDE Analysis Run 10/31/2019 2:09 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

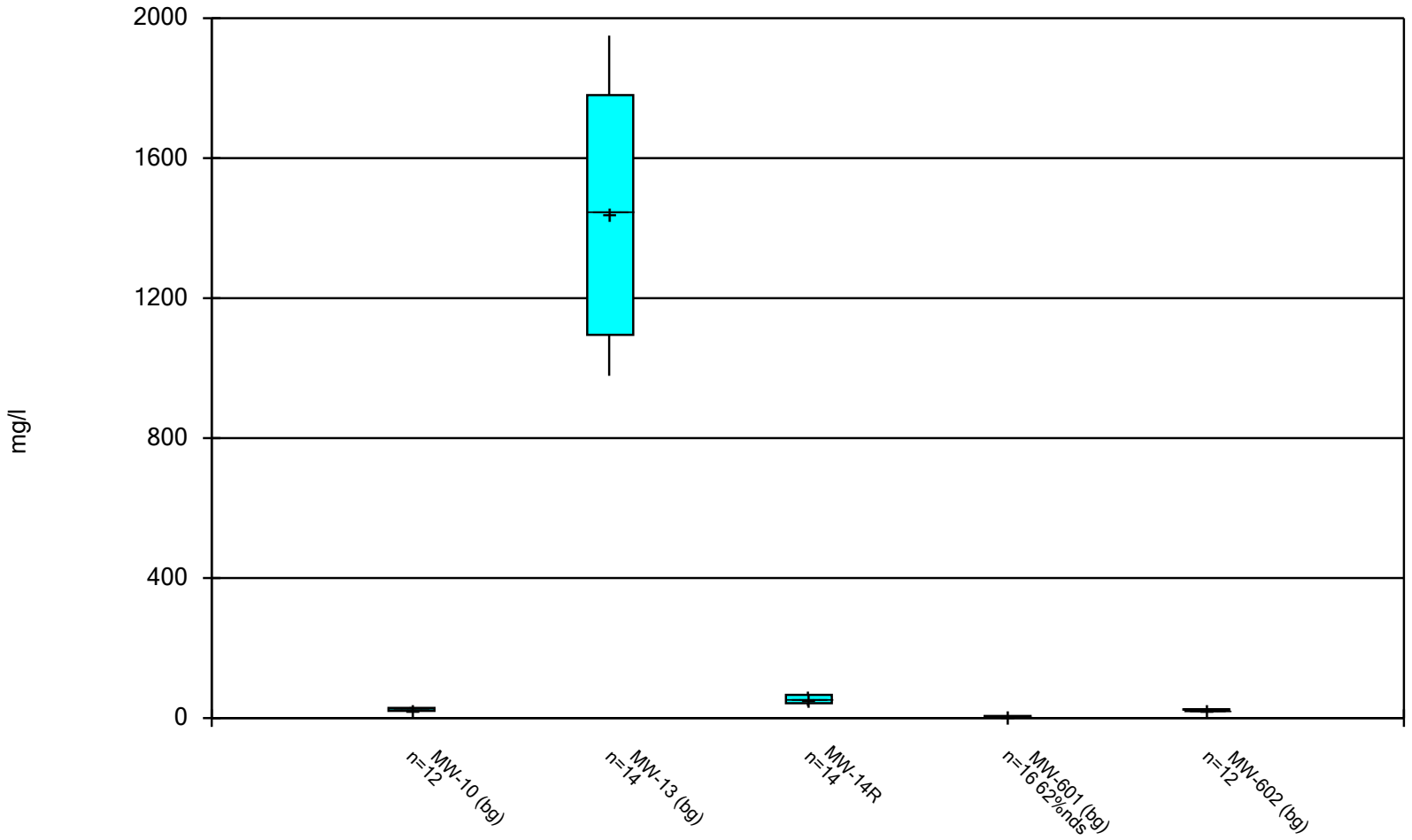
Box & Whiskers Plot

Constituent: CHLORIDE (mg/l) Analysis Run 10/31/2019 2:10 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-13 (bg)	MW-14R	MW-601 (bg)	MW-602 (bg)
6/6/2016	56.7				
6/9/2016		18	4.95	161	
6/10/2016					16.9
8/9/2016				161	17.3
8/11/2016	60.2	18.5	5.05		
10/12/2016	62.7				
10/13/2016		19.2	4.22	201	16.8
12/7/2016				169	
12/9/2016	66.6		3.86		16.4
12/13/2016		16.4			
2/8/2017	67			168	17.6
2/9/2017			3.98		
2/10/2017		15.6			
4/6/2017	63.7	16.8		156	
4/7/2017			4.11		17.2
6/15/2017	63.6	17.2	4.25	167	17.2
8/8/2017		16.2			
8/9/2017				168	
8/10/2017	63.8		4.38		17.8
10/4/2017	62.8				
10/5/2017		13.6	4.12		17.9
10/6/2017				166	
5/23/2018	57.9	14.3	5.17	160	17.6
9/17/2018		13.1			
11/30/2018	55.5	12.8	5.69	160	16.5
1/14/2019		12.5	5.96	157	
3/11/2019			4.44		
5/23/2019	52.5	16.2	5.33	162	16.9
7/17/2019			6.14	32.3 (i)	
8/23/2019			6.08		
Median	62.75	16.2	4.695	161.5	17.2
LowerQ.	57.3	13.35	4.17	158.5	16.85
UpperQ.	63.75	17.6	5.51	168	17.6
Min	52.5	12.5	3.86	32.3	16.4
Max	67	19.2	6.14	201	17.9
Mean	61.08	15.74	4.858	156.3	17.18

Box & Whiskers Plot



Constituent: SULFATE Analysis Run 10/31/2019 2:09 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

Constituent: SULFATE (mg/l) Analysis Run 10/31/2019 2:10 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-13 (bg)	MW-14R	MW-601 (bg)	MW-602 (bg)
6/6/2016	15.9				
6/9/2016		1830	75.8	<5	
6/10/2016					25.1
8/9/2016				<5	25.2
8/11/2016	19.9	1730	74.2		
10/12/2016	21.6				
10/13/2016		1830	40.1	<5	23.4
12/7/2016				<5	
12/9/2016	26.8		34.9		24.2
12/13/2016		1270			
2/8/2017	30.7			<5	27.5
2/9/2017			50.4		
2/10/2017		1950			
4/6/2017	31.6	1480		<5	
4/7/2017			44.3		23.8
6/15/2017	31.1	1630	44.2	<5	24.4
8/8/2017		1410			
8/9/2017				<5	
8/10/2017	27.6		44		24.8
10/4/2017	25.5				
10/5/2017		1330	40.7		26.9
10/6/2017				<5	
5/23/2018	26.7	1070	54.5	<5	23.9
9/17/2018		1010			
11/30/2018	17.8	978	65.4	5.98	24.2
1/14/2019		1120	66.9	5.97	
3/11/2019				5.89	
5/23/2019	23.1	1520	54.5	6.76	24.2
7/17/2019			59.6 (i)	5.75	
8/23/2019				6.32	
Median	26.1	1445	52.45	2.5	24.3
LowerQ.	20.75	1095	42.35	2.5	24.05
UpperQ.	29.15	1780	66.15	5.93	25.15
Min	15.9	978	34.9	2.5	23.4
Max	31.6	1950	75.8	6.76	27.5
Mean	24.86	1440	53.54	3.854	24.8

Box & Whiskers Plot

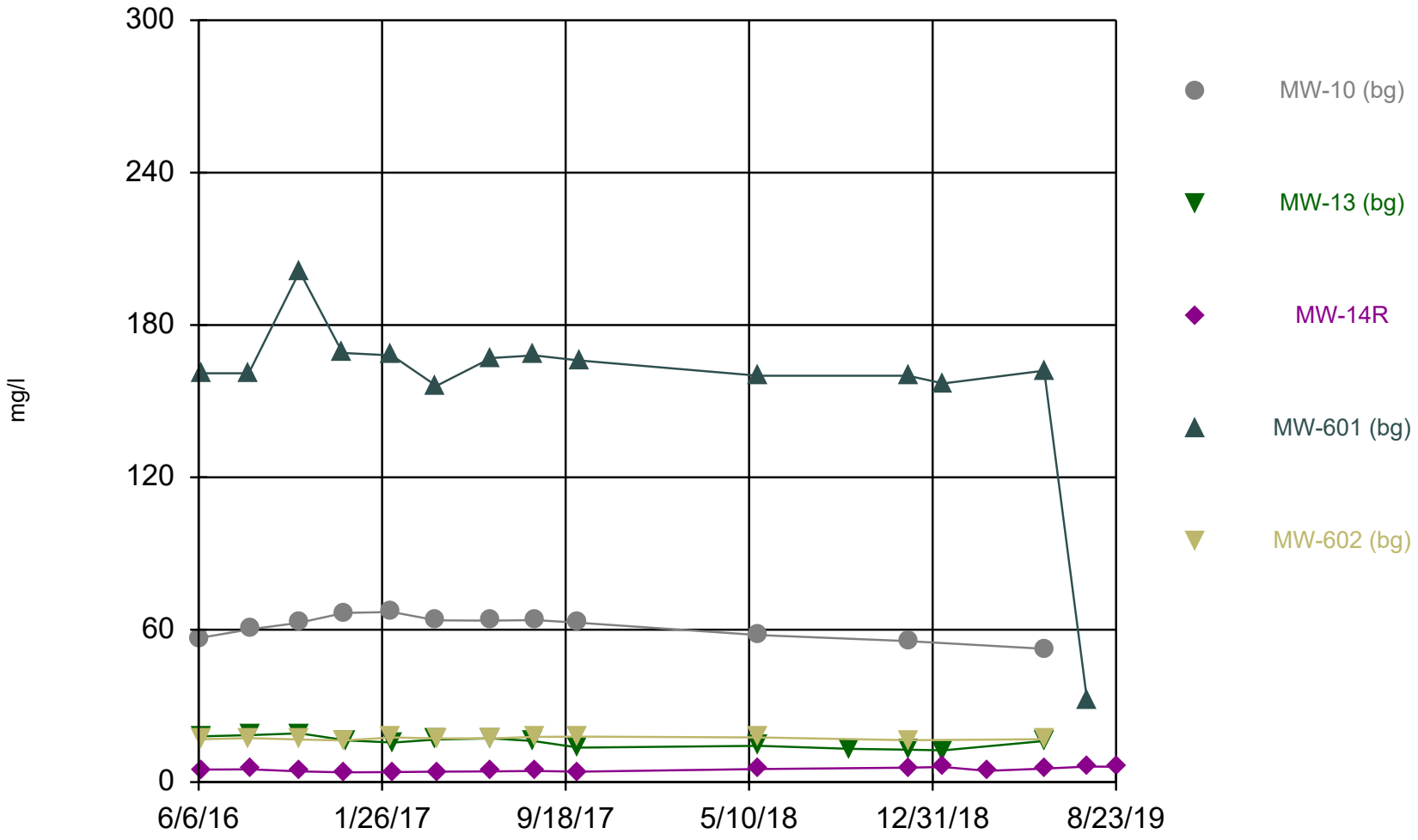
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 10/31/2019, 2:10 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
CHLORIDE (mg/l)	MW-10 (bg)	12	61.08	4.538	1.31	62.75	52.5	67	0
CHLORIDE (mg/l)	MW-13 (bg)	14	15.74	2.177	0.5817	16.2	12.5	19.2	0
CHLORIDE (mg/l)	MW-14R	16	4.858	0.7941	0.1985	4.695	3.86	6.14	0
CHLORIDE (mg/l)	MW-601 (bg)	14	156.3	37.34	9.979	161.5	32.3	201	0
CHLORIDE (mg/l)	MW-602 (bg)	12	17.18	0.4901	0.1415	17.2	16.4	17.9	0
SULFATE (mg/l)	MW-10 (bg)	12	24.86	5.24	1.513	26.1	15.9	31.6	0
SULFATE (mg/l)	MW-13 (bg)	14	1440	324.9	86.83	1445	978	1950	0
SULFATE (mg/l)	MW-14R	14	53.54	13.15	3.513	52.45	34.9	75.8	0
SULFATE (mg/l)	MW-601 (bg)	16	3.854	1.818	0.4546	2.5	2.5	6.76	62.5
SULFATE (mg/l)	MW-602 (bg)	12	24.8	1.242	0.3584	24.3	23.4	27.5	0

Appendix C

Time Series Plots

Time Series



Constituent: CHLORIDE Analysis Run 10/31/2019 2:10 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

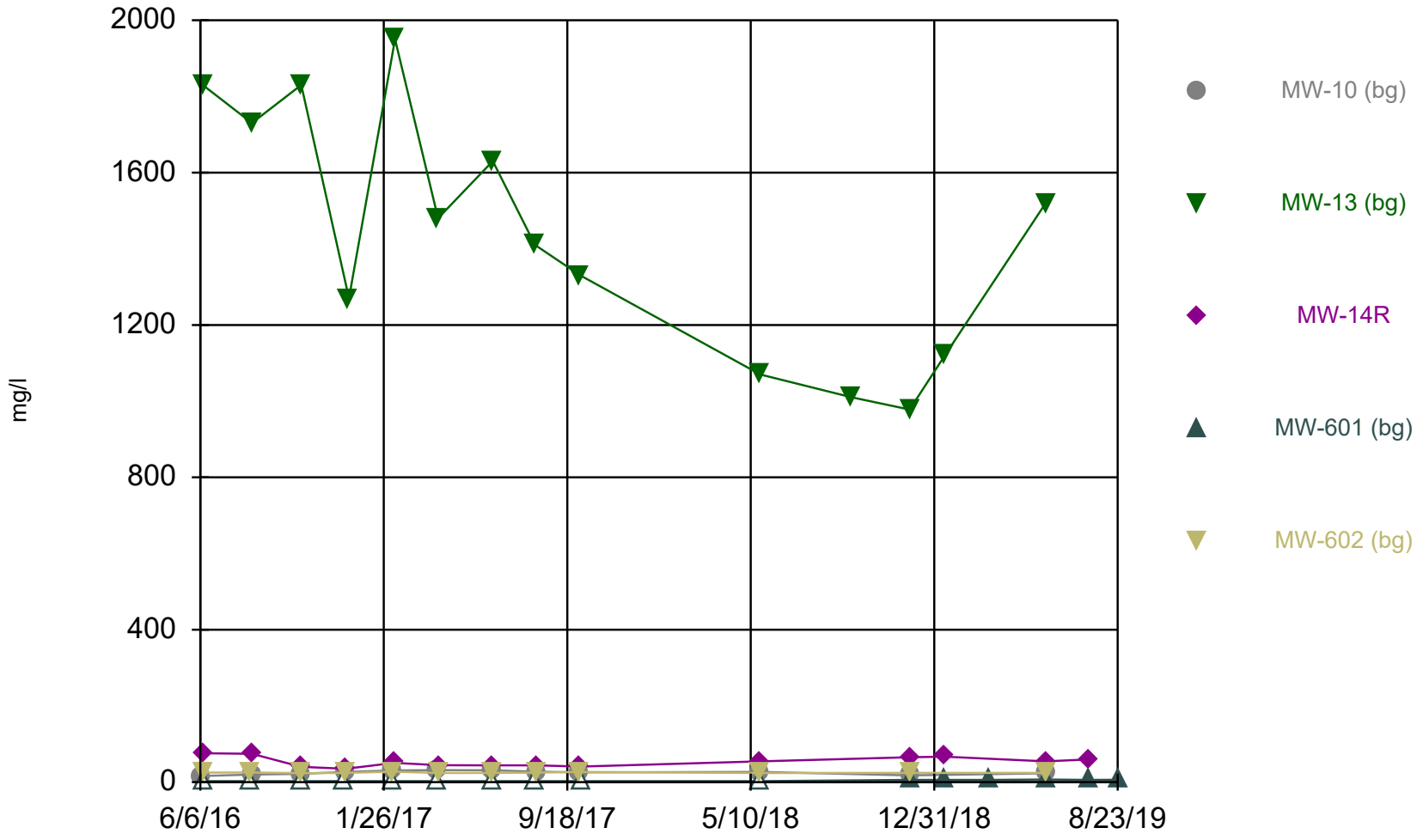
Constituent: CHLORIDE (mg/l) Analysis Run 10/31/2019 2:12 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-13 (bg)	MW-14R	MW-601 (bg)	MW-602 (bg)
6/6/2016	56.7				
6/9/2016		18	4.95	161	
6/10/2016					16.9
8/9/2016				161	17.3
8/11/2016	60.2	18.5	5.05		
10/12/2016	62.7				
10/13/2016		19.2	4.22	201	16.8
12/7/2016				169	
12/9/2016	66.6		3.86		16.4
12/13/2016		16.4			
2/8/2017	67			168	17.6
2/9/2017			3.98		
2/10/2017		15.6			
4/6/2017	63.7	16.8		156	
4/7/2017			4.11		17.2
6/15/2017	63.6	17.2	4.25	167	17.2
8/8/2017		16.2			
8/9/2017				168	
8/10/2017	63.8		4.38		17.8
10/4/2017	62.8				
10/5/2017		13.6	4.12		17.9
10/6/2017				166	
5/23/2018	57.9	14.3	5.17	160	17.6
9/17/2018		13.1			
11/30/2018	55.5	12.8	5.69	160	16.5
1/14/2019		12.5	5.96	157	
3/11/2019			4.44		
5/23/2019	52.5	16.2	5.33	162	16.9
7/17/2019			6.14	32.3 (i)	
8/23/2019			6.08		

Hollow symbols indicate censored values.

Time Series



Constituent: SULFATE Analysis Run 10/31/2019 2:10 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: SULFATE (mg/l) Analysis Run 10/31/2019 2:12 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-13 (bg)	MW-14R	MW-601 (bg)	MW-602 (bg)
6/6/2016	15.9				
6/9/2016		1830	75.8	<5	
6/10/2016					25.1
8/9/2016				<5	25.2
8/11/2016	19.9	1730	74.2		
10/12/2016	21.6				
10/13/2016		1830	40.1	<5	23.4
12/7/2016				<5	
12/9/2016	26.8		34.9		24.2
12/13/2016		1270			
2/8/2017	30.7			<5	27.5
2/9/2017			50.4		
2/10/2017		1950			
4/6/2017	31.6	1480		<5	
4/7/2017			44.3		23.8
6/15/2017	31.1	1630	44.2	<5	24.4
8/8/2017		1410			
8/9/2017				<5	
8/10/2017	27.6		44		24.8
10/4/2017	25.5				
10/5/2017		1330	40.7		26.9
10/6/2017				<5	
5/23/2018	26.7	1070	54.5	<5	23.9
9/17/2018		1010			
11/30/2018	17.8	978	65.4	5.98	24.2
1/14/2019		1120	66.9	5.97	
3/11/2019				5.89	
5/23/2019	23.1	1520	54.5	6.76	24.2
7/17/2019			59.6 (i)	5.75	
8/23/2019				6.32	