2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CCR LANDFILL
MONTROSE GENERATING STATION
CLINTON, MISSOURI

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

SCS ENGINEERS

27213168.19 | 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 Registered Geologist in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill at the Montrose Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).

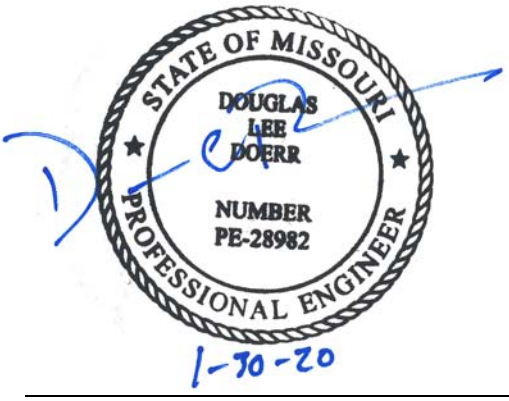
John R. Rockhold, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the CCR Landfill at the Montrose 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 13:38:45 -06'00'



Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions

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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 at the Montrose 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 all background (or upgradient) and downgradient monitoring wells with identification numbers for the CCR Landfill 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 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 Landfill Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill, Montrose Generating Station (June 2019).

C.2 CCR Landfill Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill, Montrose 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 Montrose 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 Montrose Generating Station CCR Landfill. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND:

- PERMITTED SOLID WASTE FACILITY BOUNDARY (APPROXIMATE)
- CCR LANDFILL UNIT BOUNDARY (APPROXIMATE)
- MW-602 CCR GROUNDWATER MONITORING SYSTEM WELLS
- ASH IMPOUNDMENT UNIT BOUNDARY (APPROXIMATE)

NOTES:

1. HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM, WEST ZONE (NAD 83)
2. VERTICAL DATUM: NAVD 88
3. GOOGLE EARTH IMAGE DATED 10/20/2014. BOUNDARY AND MONITOR WELL LOCATIONS ARE APPROXIMATE.
4. BOUNDARY AND MONITOR WELL LOCATIONS PROVIDED BY AECOM

200 0 200 400
SCALE FEET

REV.	DATE	CK. BY
0	-	-
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-

SHEET TITLE
SITE MAP
CCR LANDFILL
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2019 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

CLIENT
EVERGY METRO, INC
MONTROSE GENERATING STATION
MONTROSE, MISSOURI

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ENVIRONMENTAL CONSULTANTS AND CONTRACTORS
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PROJ. NO.	DWN. BY:	CHK. BY:	QA/QC BY:	PROJ. MGR.
27213168.19	TCW	JRR	JRR	JRF

DSN. BY: TCW

CADD FILE: FIGURE 1_MONT LF.DWG

DATE: 1/07/20

FIGURE NO. 1

N:\KCP\PROJECTS\GROUNDWATER\DWG\MONTROSE\2018\ANNUAL CCR REPORTING\FIGURE 1_MONT LF.DWG

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
CCR Landfill
Appendix III Detection Monitoring Results
Evergy Montrose 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-506	5/21/2019	<0.200	357	76.0	0.108	5.49	2130	2460
MW-506	11/5/2019	<0.200	341	74.5	<0.100	5.44	1760	2280
MW-601	5/21/2019	<0.200	472	55.5	0.487	5.34	3230	4410
MW-601	7/15/2019	---	---	*56.5	---	**5.96	---	---
MW-601	8/19/2019	---	---	*54.5	---	**5.41	---	---
MW-601	11/5/2019	<0.200	457	52.8	0.402	5.20	2950	3880
MW-602	1/10/2019	---	---	---	---	**5.90	---	*1870
MW-602	5/21/2019	4.48	342	4.11	0.132	5.77	1260	1870
MW-602	11/5/2019	4.16	325	3.69	0.140	6.00	1110	1880
MW-603	5/21/2019	7.35	429	8.24	0.365	4.32	2480	2990
MW-603	7/15/2019	*6.49	---	*8.75	---	**5.13	---	---
MW-603	8/19/2019	---	---	*6.54	---	**4.46	---	---
MW-603	11/5/2019	5.96	410	6.66	0.436	4.56	2010	2530
MW-604	5/21/2019	4.86	476	15.5	0.519	5.82	2090	3270
MW-604	7/15/2019	---	---	---	---	**6.20	---	*2680
MW-604	11/5/2019	4.30	407	12.5	0.428	5.89	1650	2340
MW-605	1/10/2019	---	---	*50.9	---	**5.79	---	---
MW-605	3/13/2019	---	---	*52.4	---	**5.73	---	---
MW-605	5/21/2019	1.65	416	55.4	0.222	5.64	1970	2810
MW-605	7/15/2019	---	---	*57.8	---	**5.85	---	---
MW-605	8/19/2019	---	---	*57.9	---	**5.42	---	---
MW-605	11/5/2019	1.50	399	59.1	0.195	5.59	1730	2380

* 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
Detection Monitoring Field Measurements
Evergy Montrose 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-506	5/21/2019	5.49	3230	11.15	9.5	131	0.68	3.02	758.55
MW-506	11/5/2019	5.44	3050	16.59	23.3	179	0.79	3.21	758.36
MW-601	5/21/2019	5.34	4960	11.62	21.0	93	0.00	8.49	756.62
MW-601	7/15/2019	**5.96	4780	15.54	23.6	154	6.63	8.78	756.33
MW-601	8/19/2019	**5.41	4510	19.20	21.5	239	0.12	9.96	755.15
MW-601	11/5/2019	5.20	4700	16.65	18.5	167	0.55	9.40	755.71
MW-602	1/10/2019	**5.90	2350	13.60	6.8	-59	7.41	3.98	751.88
MW-602	5/21/2019	5.77	2230	14.30	9.9	25	5.85	3.81	752.05
MW-602	11/5/2019	6.00	2060	15.48	0.0	85	1.01	3.70	752.16
MW-603	5/21/2019	4.32	3580	14.51	5.4	181	0.00	11.55	752.09
MW-603	7/15/2019	**5.13	3290	16.50	0.0	151	1.23	12.55	751.09
MW-603	8/19/2019	**4.46	3080	20.85	0.0	389	0.00	12.37	751.27
MW-603	11/5/2019	4.56	3200	15.31	0.0	137	0.89	11.32	752.32
MW-604	5/21/2019	5.82	3300	14.23	0.0	214	0.71	11.38	752.01
MW-604	7/15/2019	**6.20	2770	16.05	0.0	133	0.97	12.65	750.74
MW-604	11/5/2019	5.89	2820	15.36	0.0	114	0.73	11.33	752.06
MW-605	1/10/2019	**5.79	3140	14.40	0.0	425	0.00	12.07	752.04
MW-605	3/13/2019	**5.73	3370	15.68	0.0	258	0.46	12.91	751.20
MW-605	5/21/2019	5.64	3210	13.83	0.0	216	1.55	12.15	751.96
MW-605	7/15/2019	**5.85	3110	16.91	0.0	129	0.96	12.60	751.51
MW-605	8/19/2019	**5.42	2920	19.49	0.0	237	0.00	12.51	751.60
MW-605	11/5/2019	5.59	3020	16.32	0.0	118	0.76	11.64	752.47

* 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

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

C.1 CCR Landfill Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill, Montrose Generating Station (June 2019)

C.2 CCR Landfill Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill, Montrose Generating Station (December 2019)

C.1 CCR Landfill Groundwater Monitoring Alternative Source Demonstration Report November 2018 Groundwater Monitoring Event, CCR Landfill, Montrose Generating Station (June 2019)

CCR LANDFILL GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
NOVEMBER 2018 GROUNDWATER MONITORING EVENT

CCR LANDFILL
MONTROSE GENERATING STATION
CLINTON, MISSOURI

Presented To:

Kansas City Power & Light Company

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

June 2019

File No. 27213168.18

CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Montrose 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, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Montrose 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 at the Montrose 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 19, 2018. Review and validation of the results from the November 2018 Detection Monitoring Event was completed on December 31, 2018, which constitutes completion and finalization of detection monitoring laboratory analyses. A statistical analysis was then conducted to determine whether there was an 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 10, 2019 and March 13, 2019.

The completed statistical evaluation identified one Appendix III constituent above its prediction limit. The prediction limit for chloride in monitoring well MW-605 is 50.32 mg/L. The detection monitoring sample was reported at 51.7 mg/L. The first verification re-sample was collected on January 10, 2019 with a result of 50.9 mg/L. The second verification re-sample was collected on March 13, 2019 with a result of 52.4 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for chloride from monitoring well MW-605 exceeds its prediction limit and is a confirmed statistically significant increase (SSI) 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 an SSI above the background prediction limit for chloride in monitoring well MW-605.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration (ASD) 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 CCR Landfill at the Montrose Generating Station, there are multiple lines of supporting evidence to indicate the above SSI was not caused by a release from the CCR Landfill. Select multiple lines of supporting evidence are described as follows.

3.1 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.

An SSI was identified in well MW-605 for chloride. Therefore, box and whiskers plots for chloride in MW-605 and the two upgradient wells MW-506 and MW-601 were prepared to allow comparison of the chloride concentrations between wells. The comparison between wells indicates the chloride concentrations in well MW-605 are within or below the range of chloride in upgradient wells. This demonstrates that a source other than the CCR Landfill caused the SSI in chloride over background levels, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots are provided in **Appendix A**.

3.2 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 generated for MW-605 and landfill leachate is provided in **Appendix B** and indicates the groundwater from this well does not exhibit the same geochemical characteristics as the leachate. The groundwater and the leachate plot in totally different hydrochemical facies indicating there is no mixing of the two types of water (groundwater and leachate). This demonstrates that a source other than the CCR Landfill caused the SSIs over background levels for chloride or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

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 the chloride concentrations in MW-605 were plotted along with the chloride concentrations for upgradient wells MW-506 and MW-601. The plots indicate the chloride concentrations in MW-605 are below the concentrations in MW-506 and are typically below or very near the concentrations in MW-601. This demonstrates that a source other than the CCR Landfill caused the SSI over background levels, 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 caused the SSI over background levels, 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 CCR Landfill may continue with the detection monitoring program under § 257.94.

5 GENERAL COMMENTS

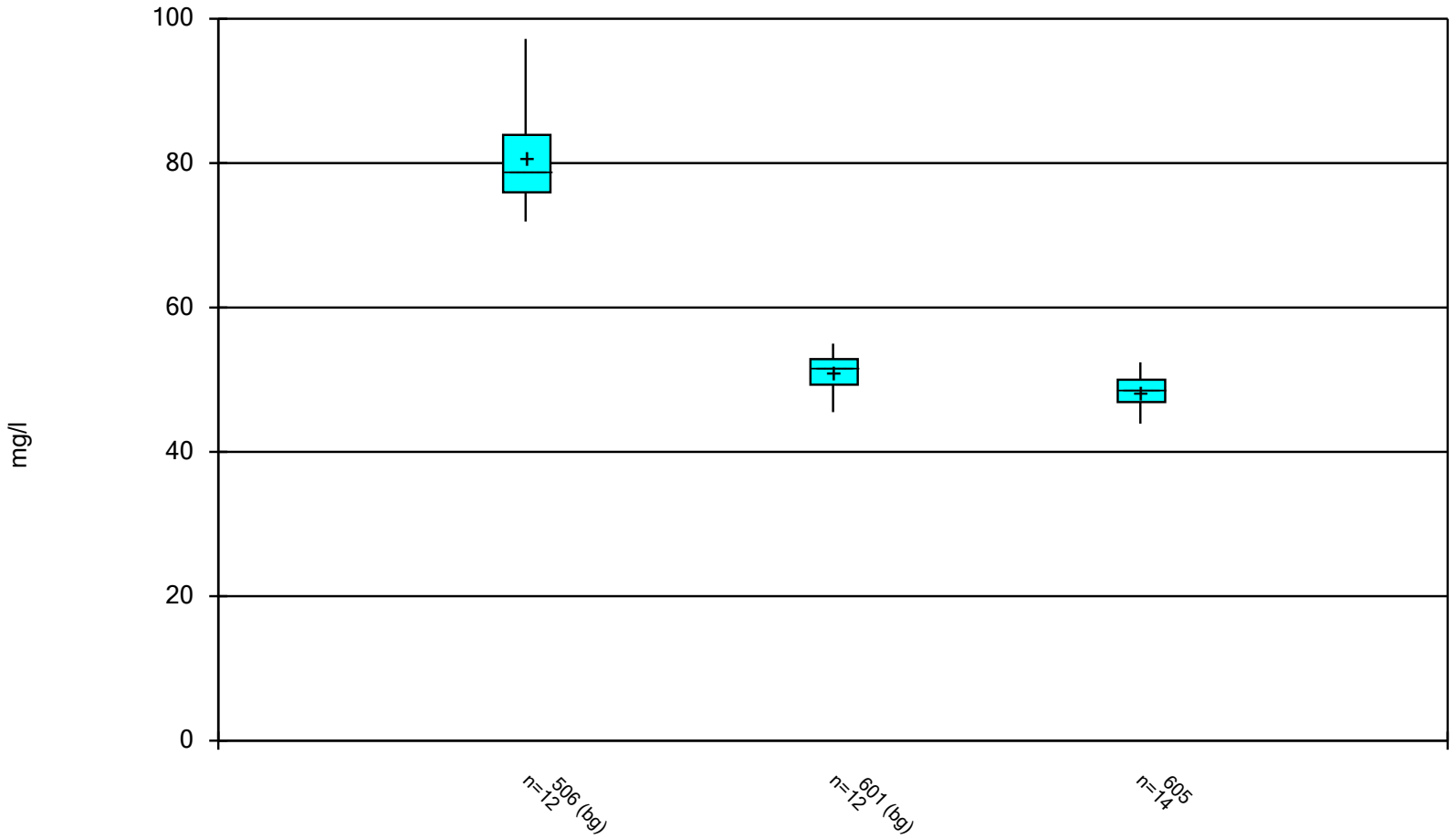
This report has been prepared and reviewed under the direction of a qualified groundwater scientist and qualified professional engineer. Please note that SCS Engineers does not warrant the work of regulatory agencies or other third parties supplying information used in the assimilation of this report.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

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Chloride Analysis Run 4/10/2019 5:54 PM View: CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Box & Whiskers Plot

Constituent: Chloride (mg/l) Analysis Run 4/10/2019 5:54 PM View: CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

	506 (bg)	601 (bg)	605
12/16/2015	92.4	52.5	
12/17/2015			43.9
2/16/2016	97.2	53	45.7
5/23/2016	84.7	50.6	47.3
8/22/2016	77.5	45.5	46.5
11/7/2016			48.2
11/8/2016	73.1	47.5	
2/7/2017	79	49	48
5/1/2017	79.2		
5/2/2017		51.1	48.7
7/31/2017	71.9	52.7	49.1
10/2/2017	74.4	52.4	48.7
11/15/2017	77.7	54.2	48.8
5/14/2018	79	55	47.8
11/19/2018	83.1	49.6	51.7
1/10/2019			50.9
3/13/2019			52.4
Median	79	51.75	48.45
LowerQ.	75.95	49.3	46.9
UpperQ.	83.9	52.85	50
Min	71.9	45.5	43.9
Max	97.2	55	52.4
Mean	80.77	51.09	48.41

Box & Whiskers Plot

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose Printed 4/10/2019, 5:54 PM

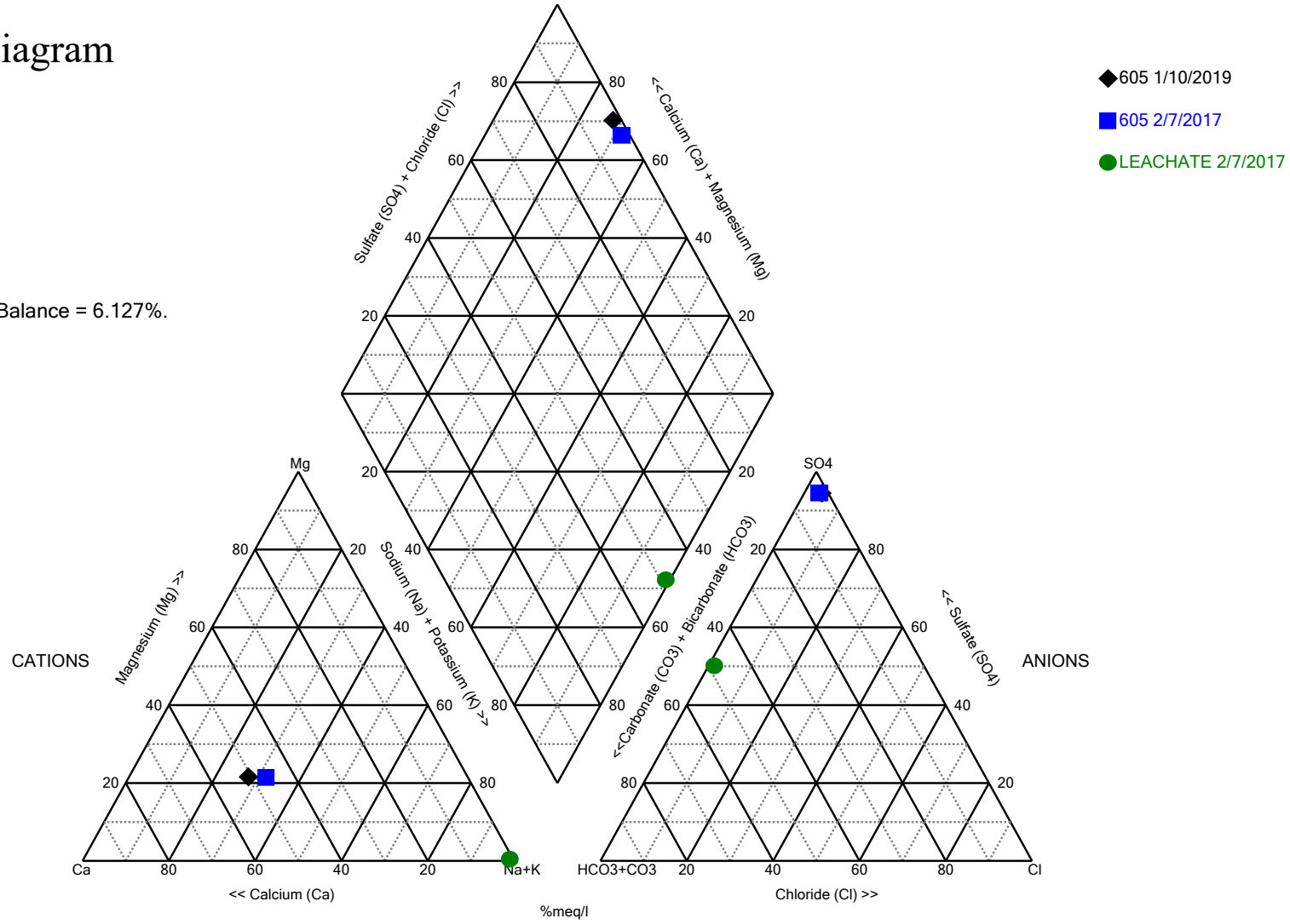
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Chloride (mg/l)	506 (bg)	12	80.77	7.586	2.19	79	71.9	97.2	0
Chloride (mg/l)	601 (bg)	12	51.09	2.794	0.8066	51.75	45.5	55	0
Chloride (mg/l)	605	14	48.41	2.268	0.6062	48.45	43.9	52.4	0

Appendix B

Piper Diagram

Piper Diagram

Cation-Anion Balance = 6.127%.



Analysis Run 4/11/2019 9:50 AM View: Piper Dates

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Piper Diagram

Analysis Run 4/11/2019 9:51 AM View: Piper Dates

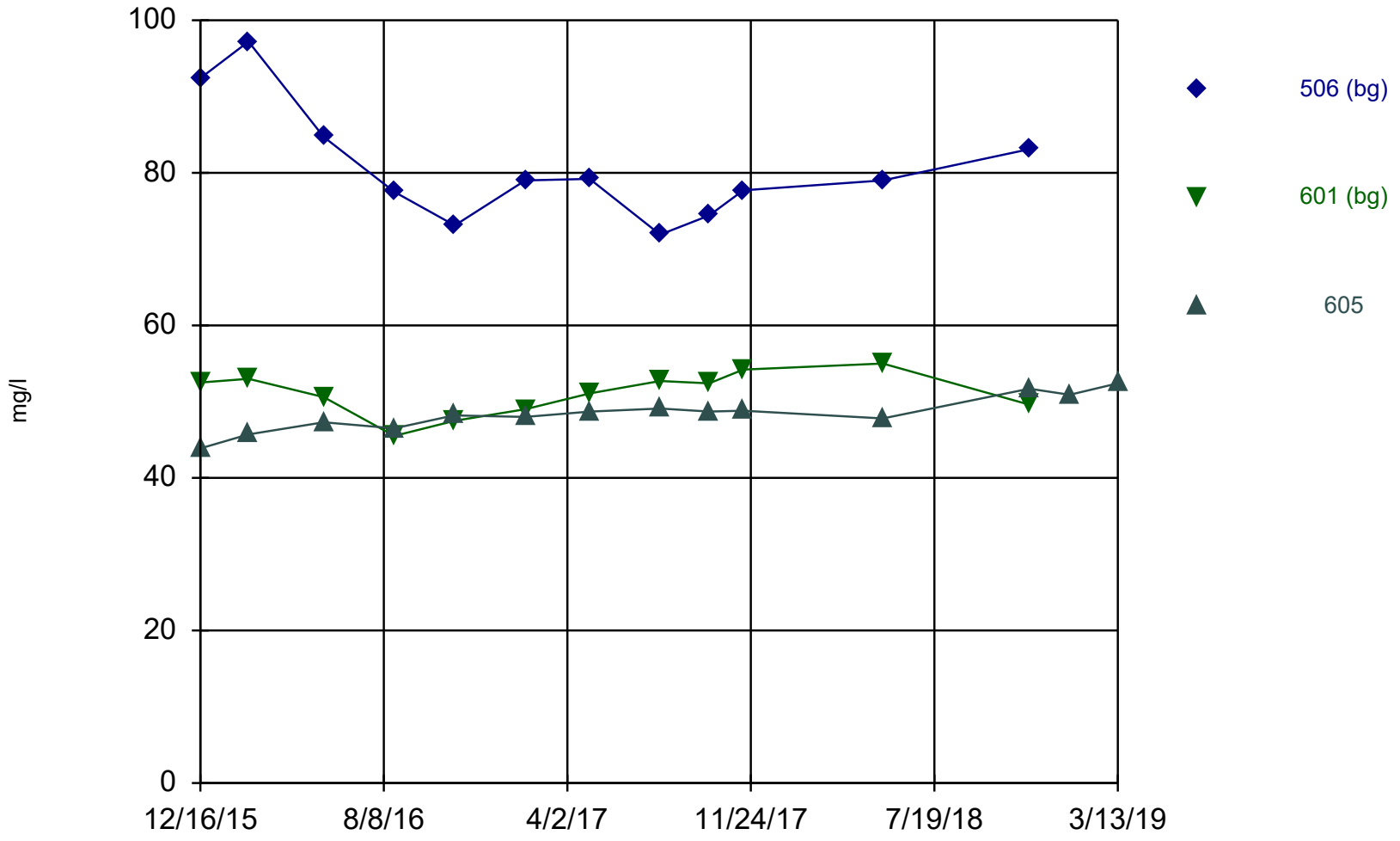
Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
605 2/7/2017	284	2.71	367	101	48	2050	48.1	10
605 1/10/2019	264	2.79	421	107	50.9	1870	42	10
LEACHATE 2/7/2017	1050	23.9	5.47	0.5	16.3	1360	10	840

Appendix C

Time Series Plots

Time Series



Constituent: Chloride Analysis Run 4/10/2019 5:53 PM View: CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Time Series

Constituent: Chloride (mg/l) Analysis Run 4/10/2019 5:54 PM View: CCR III
Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

	506 (bg)	601 (bg)	605
12/16/2015	92.4	52.5	
12/17/2015			43.9
2/16/2016	97.2	53	45.7
5/23/2016	84.7	50.6	47.3
8/22/2016	77.5	45.5	46.5
11/7/2016			48.2
11/8/2016	73.1	47.5	
2/7/2017	79	49	48
5/1/2017	79.2		
5/2/2017		51.1	48.7
7/31/2017	71.9	52.7	49.1
10/2/2017	74.4	52.4	48.7
11/15/2017	77.7	54.2	48.8
5/14/2018	79	55	47.8
11/19/2018	83.1	49.6	51.7
1/10/2019			50.9
3/13/2019			52.4

C.2 CCR Landfill Groundwater Monitoring Alternative Source Demonstration Report May 2019 Groundwater Monitoring Event, CCR Landfill, Montrose Generating Station (December 2019)

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

CCR LANDFILL
MONTROSE GENERATING STATION
CLINTON, MISSOURI

Presented To:

Evergy Metro, Inc.

Presented By:

SCS ENGINEERS

8575 West 110th Street, Suite 100

Overland Park, Kansas 66210

December 2019

File No. 27213168.18

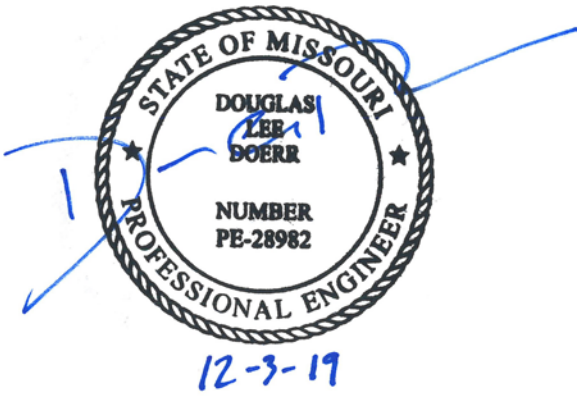
CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Registered Geologist in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Montrose 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, R.G.

SCS Engineers

I, Douglas L. Doerr, being a qualified licensed Professional Engineer in the State of Missouri, do hereby certify the accuracy of the information in the CCR Groundwater Monitoring Alternative Source Demonstration Report for the CCR Landfill at the Montrose 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 at the Montrose 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 21, 2019. Review and validation of the results from the May 2019 Detection Monitoring Event was completed on July 3, 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 15, 2019 and August 19, 2019.

The completed statistical evaluation identified one Appendix III constituent above its prediction limit in monitoring well MW-605.

Constituent/Monitoring Well	*UPL	Observation May 21, 2019	1st Verification July 15, 2019	2nd Verification August 19, 2019
Chloride				
605	50.32	55.4	57.8	57.9

*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 an SSI above the background prediction limit for chloride in monitoring well MW-605.

3 ALTERNATIVE SOURCE DEMONSTRATION

An Alternative Source Demonstration (ASD) 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 CCR Landfill at the Montrose Generating Station, there are multiple lines of supporting evidence to indicate the above SSI was not caused by a release from the CCR Landfill. Select multiple lines of supporting evidence are described as follows.

3.1 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.

An SSI was identified in well MW-605 for chloride. Therefore, box and whiskers plots for chloride in MW-605 and the two upgradient wells MW-506 and MW-601 were prepared to allow comparison of the chloride concentrations between wells. The comparison between wells indicates the chloride concentrations in well MW-605 are within or below the range of chloride in upgradient wells. This demonstrates that a source other than the CCR Landfill caused the SSI in chloride over background levels, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker plots are provided in **Appendix A**.

3.2 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 generated for MW-605 and landfill leachate is provided in **Appendix B** and indicates the groundwater from this well does not exhibit the same geochemical characteristics as the leachate. The

groundwater and the leachate plot in totally different hydrochemical facies indicating there is no mixing of the two types of water (groundwater and leachate). This demonstrates that a source other than the CCR Landfill caused the SSI over background levels for chloride or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality.

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 the chloride concentrations in MW-605 were plotted along with the chloride concentrations for upgradient wells MW-506 and MW-601. The plots indicate the chloride concentrations in MW-605 are below the concentrations in MW-506 and are typically below or very near the concentrations in MW-601. This demonstrates that a source other than the CCR Landfill caused the SSI over background levels, 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 caused the SSI over background levels, 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 CCR Landfill 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 Montrose Generating Station. No warranties, express or implied, are intended or made.

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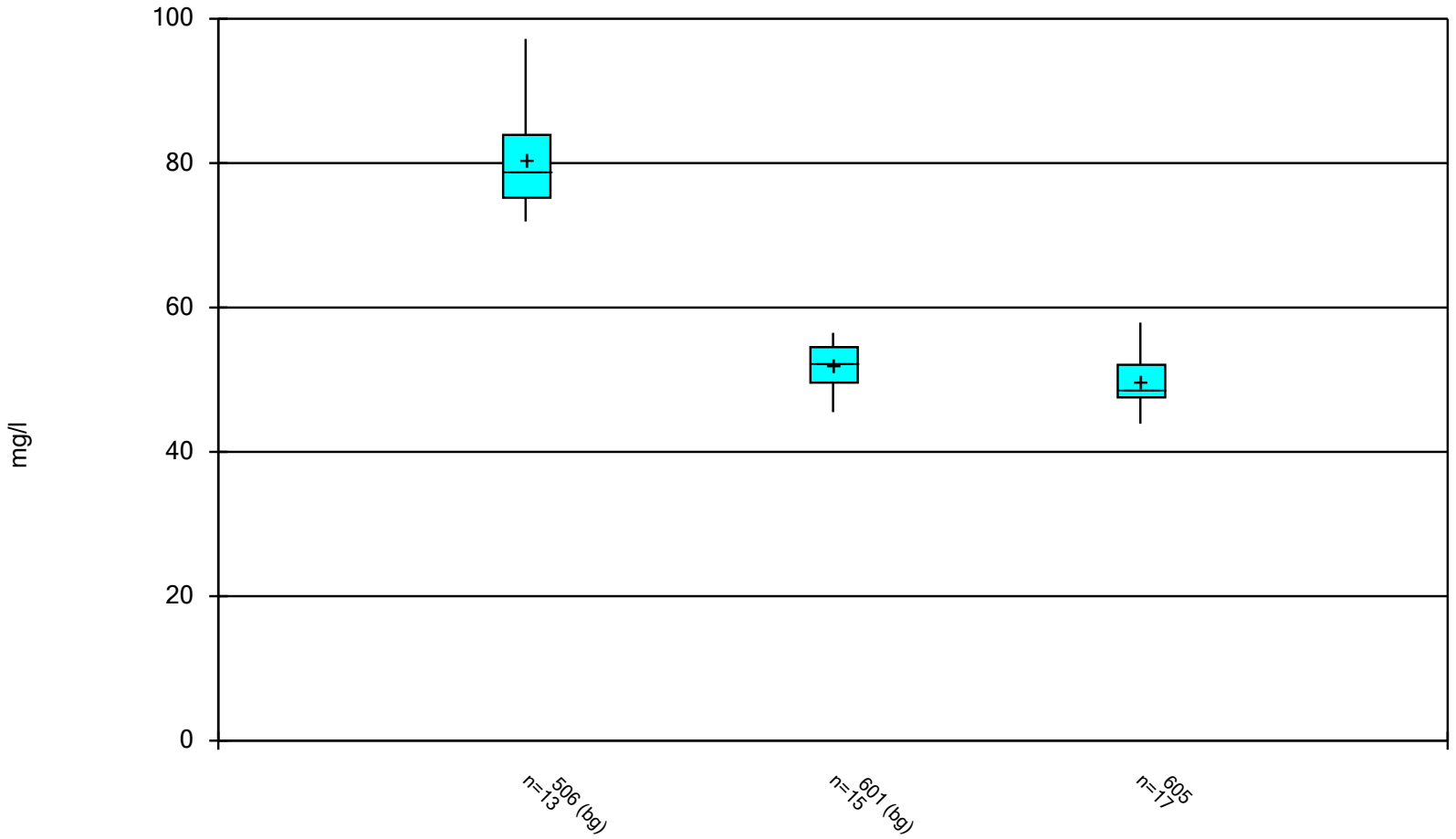
and actual conditions may vary from those encountered at the times and locations where data are obtained, despite the use of due care.

Appendix A

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: Chloride Analysis Run 11/4/2019 10:06 AM View: LF CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Box & Whiskers Plot

Constituent: Chloride (mg/l) Analysis Run 11/4/2019 10:07 AM View: LF CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

	506 (bg)	601 (bg)	605
12/16/2015	92.4	52.5	
12/17/2015			43.9
2/16/2016	97.2	53	45.7
5/23/2016	84.7	50.6	47.3
8/22/2016	77.5	45.5	46.5
11/7/2016			48.2
11/8/2016	73.1	47.5	
2/7/2017	79	49	48
5/1/2017	79.2		
5/2/2017		51.1	48.7
7/31/2017	71.9	52.7	49.1
10/2/2017	74.4	52.4	48.7
11/15/2017	77.7	54.2	48.8
5/14/2018	79	55	47.8
11/19/2018	83.1	49.6	51.7
1/10/2019			50.9
3/13/2019			52.4
5/21/2019	76	55.5	55.4
7/15/2019		56.5	57.8
8/19/2019		54.5	57.9
Median	79	52.5	48.7
LowerQ.	75.2	49.6	47.55
UpperQ.	83.9	54.5	52.05
Min	71.9	45.5	43.9
Max	97.2	56.5	57.9
Mean	80.4	51.97	49.93

Box & Whiskers Plot

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose Printed 11/4/2019, 10:07 AM

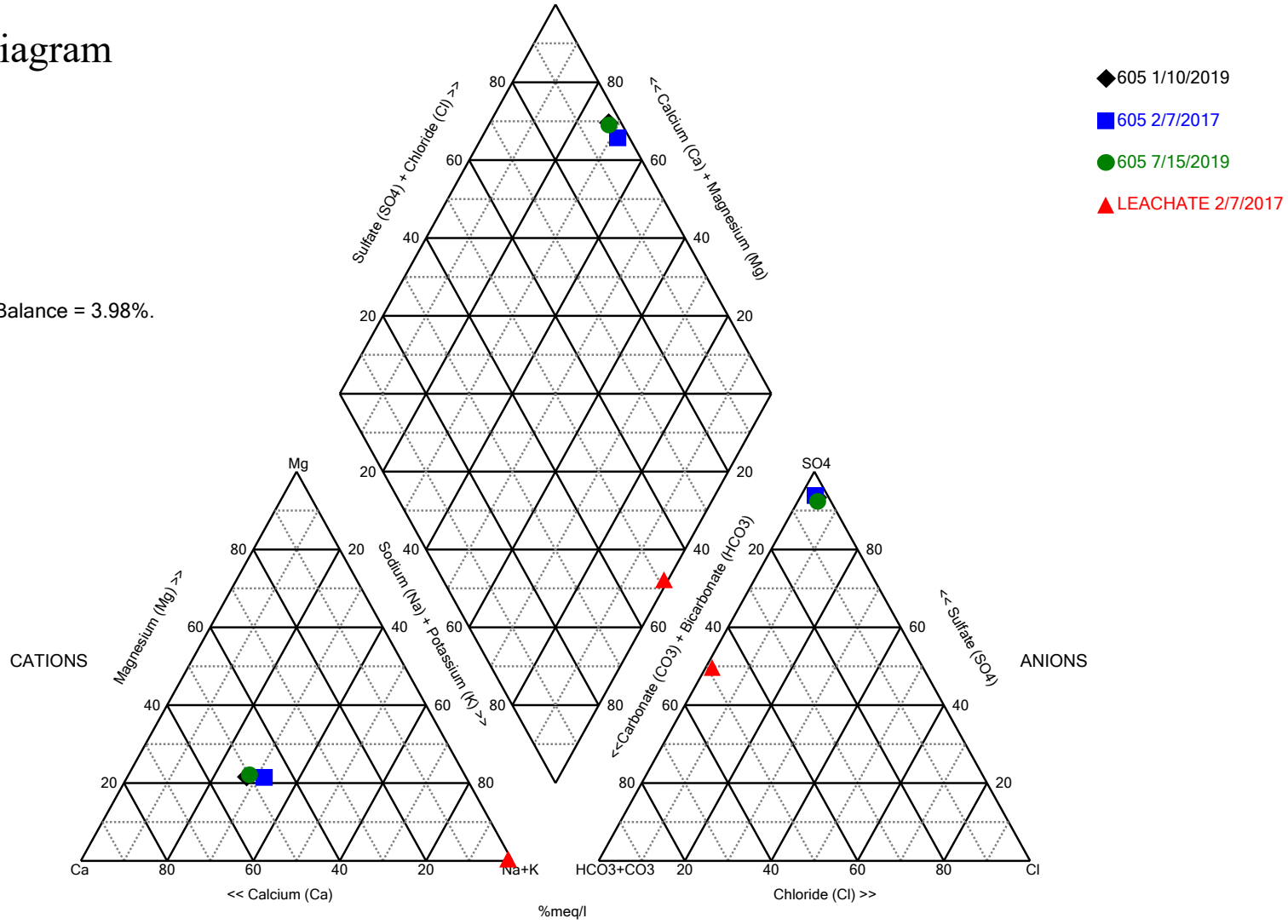
Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
Chloride (mg/l)	506 (bg)	13	80.4	7.382	2.047	79	71.9	97.2	0
Chloride (mg/l)	601 (bg)	15	51.97	3.1	0.8003	52.5	45.5	56.5	0
Chloride (mg/l)	605	17	49.93	3.99	0.9677	48.7	43.9	57.9	0

Appendix B

Piper Diagram

Piper Diagram

Cation-Anion Balance = 3.98%.



Analysis Run 11/4/2019 10:11 AM View: LF CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Piper Diagram

Analysis Run 11/4/2019 10:12 AM View: LF CCR III

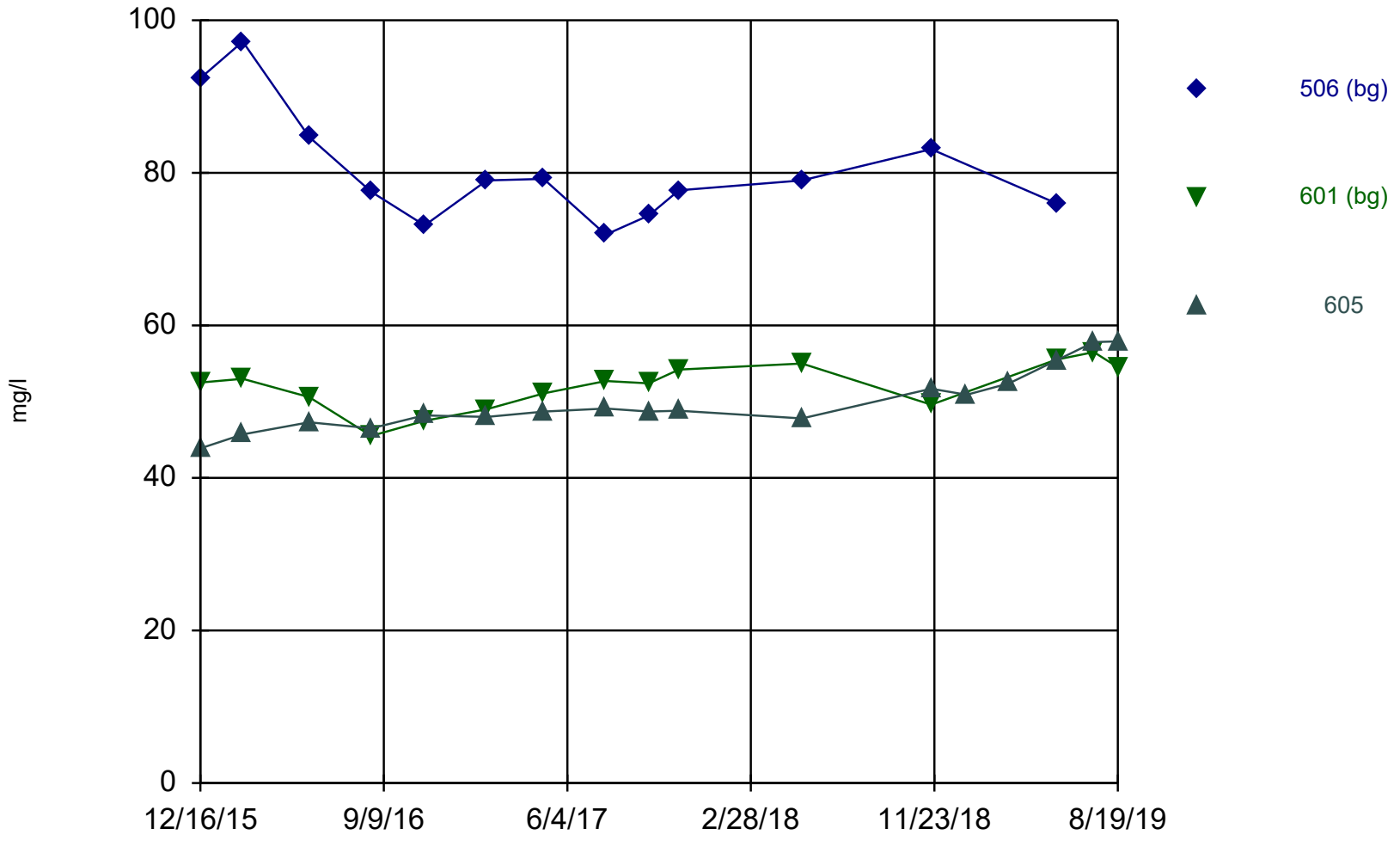
Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Totals (ppm)	Na	K	Ca	Mg	Cl	SO4	HCO3	CO3
605 2/7/2017	284	2.71	367	101	48	2050	48.1	20
605 1/10/2019	264	2.79	421	107	50.9	1870	42	20
605 7/15/2019	261	2.73	407	108	57.8	1640	41.6	20
LEACHATE 2/7/2017	1050	23.9	5.47	1	16.3	1360	20	840

Appendix C

Time Series Plots

Time Series



Constituent: Chloride Analysis Run 11/4/2019 10:04 AM View: LF CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

Time Series

Constituent: Chloride (mg/l) Analysis Run 11/4/2019 10:05 AM View: LF CCR III

Montrose Generating Station UWL Client: SCS Engineers Data: Montrose

	506 (bg)	601 (bg)	605
12/16/2015	92.4	52.5	
12/17/2015			43.9
2/16/2016	97.2	53	45.7
5/23/2016	84.7	50.6	47.3
8/22/2016	77.5	45.5	46.5
11/7/2016			48.2
11/8/2016	73.1	47.5	
2/7/2017	79	49	48
5/1/2017	79.2		
5/2/2017		51.1	48.7
7/31/2017	71.9	52.7	49.1
10/2/2017	74.4	52.4	48.7
11/15/2017	77.7	54.2	48.8
5/14/2018	79	55	47.8
11/19/2018	83.1	49.6	51.7
1/10/2019			50.9
3/13/2019			52.4
5/21/2019	76	55.5	55.4
7/15/2019		56.5	57.8
8/19/2019		54.5	57.9