2018 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

BOTTOM ASH IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:
Kansas City Power & Light Company

SCS ENGINEERS

27217233.18 | January 2019 Revised December 16, 2022

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

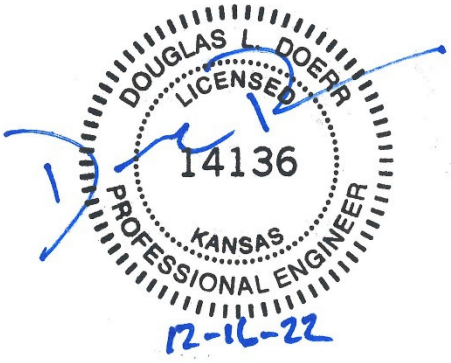
CERTIFICATIONS

I, John R. Rockhold, being a qualified groundwater scientist and Professional Geologist in the State of Kansas, do hereby certify that the 2018 Annual Groundwater Monitoring and Corrective Action Report for the Bottom Ash 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 2018 Annual Groundwater Monitoring and Corrective Action Report for the Bottom Ash Impoundment at the La Cygne Generating Station was prepared by me or under my direct supervision and fulfills the requirements of 40 CFR 257.90(e).



Douglas L. Doerr, P.E.

SCS Engineers

Revision Number	Revision Date	Revision Section	Summary of Revisions
0	January 2019	NA	Original
1	December 16, 2022	Addendum 1	Added Addendum 1

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Appendices

1 INTRODUCTION

This 2018 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 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 2018 Annual Groundwater Monitoring and Corrective Action Report for the Bottom Ash 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 Bottom Ash Impoundment and all background (or upgradient) and downgradient monitoring wells with identification numbers for the Bottom Ash 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 Bottom Ash Impoundment in 2018.

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 (2018). Samples collected in 2018 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 both the Spring 2018 semiannual detection monitoring data and the Fall 2018 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 2018. Only detection monitoring was conducted in 2018.

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 statistical evaluation of the initial Fall 2017 semiannual detection monitoring event per the certified statistical method,

b. completion of the 2017 Annual Groundwater Monitoring and Corrective Action Report,

c. completion of a successful alternative source demonstration for the Fall 2017 semiannual detection monitoring event,

d. completion of the Spring 2018 semiannual detection monitoring sampling and analysis event, and subsequent verification sampling per the certified statistical method,

e. completion of the statistical evaluation of the Spring 2018 semiannual detection monitoring event per the certified statistical method,

f. completion of a successful alternative source demonstration for the Spring 2018 semiannual

detection monitoring event, and

g. initiation of the Fall 2018 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 (2019).

Semiannual Spring and Fall 2019 groundwater sampling and analysis. Completion of verification sampling and analyses and statistical evaluation of Fall 2018 and Spring 2019 detection monitoring data 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 reports are included as **Appendix C**.

C.1 CCR Groundwater Monitoring Alternative Source Demonstration Report October 2017 Groundwater Monitoring Event, Bottom Ash Impoundment, La Cygne Generating Station (April 2018)

C.2. CCR Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event, La Cygne Generating Station (November 2018).

C.3 Supplemental Data for the Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event, La Cygne Generating Station (November 2018).

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 Kansas City Power & Light Company for specific application to the La Cygne Generating Station Bottom Ash Impoundment. No warranties, express or implied, are intended or made.

APPENDIX A

FIGURES

Figure 1: Site Map

LEGEND

CCR UNIT BOUNDARY (APPROXIMATE LIMITS OF BOTTOM ASH IMPOUNDMENT)

MW–901 CCR GROUNDWATER MONITORING SYSTEM WELLS

NOTES:

1. KDHE FACILITY PERMIT AREA BOUNDARY NOT 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
0	–	–
1	–	–
2	–	–
3	–	–
4	–	–

SHEET TITLE
SITE MAP
BOTTOM ASH IMPOUNDMENT
CCR GROUNDWATER MONITORING SYSTEM

PROJECT TITLE
2018 CCR GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT

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.	DWN. BY:	TGW	Q/A RVW BY:	JRR
27217233.18	CHK. BY:	JRR	PROJ. MGR	JRR
DSN. BY:	TGW			

CADD FILE:
FIG 1 – LA CYGNE BA IMP.DWG

DATE:
1/21/19

FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\CCR Annual Report\2018\Fig 1 - La Cygne BA Imp.dwg Jan 21, 2019 - 1:28pm Layout Name: Fig 1 By: 4338t_w

APPENDIX B

TABLES

Table 1: Appendix III Detection Monitoring Results

Table 2: Detection Monitoring Field Measurements

Table 1
Bottom Ash Impoundment
Appendix III Detection Monitoring Results
KCP&L LaCygne 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-901	1/9/2018	---	---	---	---	*6.84	---	---
MW-901	5/23/2018	1.14	57.1	22.6	0.547	7.53	17.9	520
MW-901	11/29/2018	1.16	56.4	23.0	0.517	7.12	19.7	487
MW-902	1/9/2018	---	---	---	---	**6.99	*37.9	---
MW-902	5/23/2018	1.22	70.9	33.9	0.541	7.35	32.5	511
MW-902	7/11/2018	---	*69.1	---	---	**7.28	---	---
MW-902	11/29/2018	1.25	70.4	32.1	0.488	7.07	28.6	796
MW-903	1/9/2018	---	---	---	---	*6.87	---	---
MW-903	5/23/2018	0.428	368	25.6	<0.100	6.89	896	1920
MW-903	7/11/2018	---	*371	---	---	**6.84	---	---
MW-903	8/16/2018	---	*382	---	---	**6.65	---	---
MW-903	11/29/2018	0.493	375	24.7	0.104	6.58	1120	1230
MW-904	5/23/2018	1.10	72.2	33.8	0.444	7.38	80.7	677
MW-904	7/11/2018	---	---	---	---	*7.10	---	---
MW-904	11/29/2018	1.11	72.1	33.5	0.406	7.07	81.5	604
MW-905	5/23/2018	1.78	47.8	51.9	0.581	7.68	27.5	602
MW-905	11/29/2018	1.89	46.9	52.4	0.520	7.23	29.0	619

* 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

S.U. - Standard Units

--- Not Sampled

Table 2
Bottom Ash Impoundment
Detection Monitoring Field Measurements
KCP&L 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-901	1/9/2018	*6.84	811	19.23	0.77	NA	NA	10.30	843.99
MW-901	5/23/2018	7.53	934	23.90	0.00	152	1.78	11.28	843.01
MW-901	11/29/2018	7.12	919	16.88	0.00	-4	0.00	11.28	843.01
MW-902	1/9/2018	**6.99	814	16.07	1.27	NA	NA	13.15	841.92
MW-902	5/23/2018	7.35	920	24.70	0.00	8	1.67	13.00	842.07
MW-902	7/11/2018	**7.28	908	28.94	0.00	-17	1.22	13.38	841.69
MW-902	11/29/2018	7.07	888	15.81	5.40	-32	0.00	13.60	841.47
MW-903	1/9/2018	*6.87	1889	16.21	1.07	NA	NA	12.32	842.08
MW-903	5/23/2018	6.89	2480	21.98	0.00	56	3.00	12.14	842.26
MW-903	7/11/2018	**6.84	2360	25.78	0.00	17	6.76	12.75	841.65
MW-903	8/16/2018	**6.65	2400	22.16	0.40	-5	7.15	14.80	839.60
MW-903	11/29/2018	6.58	2490	15.27	0.70	63	0.00	12.85	841.55
MW-904	5/23/2018	7.38	1200	20.78	66.10	-72	2.23	15.70	839.35
MW-904	7/11/2018	*7.10	1180	25.62	3.60	-68	2.33	17.33	837.72
MW-904	11/29/2018	7.07	1170	14.77	8.10	-38	0.00	15.14	839.91
MW-905	5/23/2018	7.68	1090	23.31	23.1	49	2.35	9.65	844.57
MW-905	11/29/2018	7.23	1080	16.01	19.9	-42	0.00	11.34	842.88

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

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

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

S.U. - Standard Units

µS - microsiemens

°C - Degrees Celsius

ft btoc - Feet Below Top of Casing

ft NGVD - National Geodetic Vertical Datum (NAVD 88)

NTU - Nephelometric Turbidity Unit

Appendix C

Alternative Source Demonstrations

C.1 Groundwater Monitoring Alternative Source Demonstration Report October 2017 Groundwater Monitoring Event

C.2 Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event

C.3 Supplemental Data, Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event

C.1 Groundwater Monitoring Alternative Source Demonstration Report October 2017 Groundwater Monitoring Event

CCR GROUNDWATER MONITORING
ALTERNATIVE SOURCE DEMONSTRATION REPORT
OCTOBER 2017 GROUNDWATER MONITORING EVENT

BOTTOM ASH IMPOUNDMENT
LA CYGNE GENERATING STATION
LA CYGNE, KANSAS

Presented To:

Kansas City Power & Light Company

Presented By:

SCS ENGINEERS
7311 West 130th Street, Suite 100
Overland Park, Kansas 66213
(913) 681-0030

April 2018
File No. 27217233.00

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 Bottom Ash 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 Bottom Ash 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

In accordance with the Coal Combustion Residuals (CCR) Final Rule § 257.94(e)(2), the owner or operator of the CCR unit may demonstrate 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. 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 Bottom Ash Impoundment at Kansas City Power & Light Company's (KCP&L) La Cygne Generating Station has been completed in substantial compliance with the "Statistical Method Certification by a Qualified Professional Engineer" document dated October 12, 2017. Groundwater samples were collected and analyzed by October 17, 2017. A statistical analysis was conducted to determine whether there is a SSI over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring.

If an SSI is preliminarily identified by the prediction limit analysis, verification retesting will be performed in accordance with the certified statistical method and the resampling plan to verify the result is not due to an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Up to two rounds of verification sampling and retesting may be conducted. Verification retesting with a "1 of 2" or "1 of 3" resampling plan is performed by collecting a verification sample(s) and comparing it to the calculated prediction limit. If the resulting concentration of any verification sample is not an SSI, then an SSI has not occurred.

Determinations of SSIs for the Bottom Ash Impoundment at the La Cygne Generating Station were completed no later than January 15, 2018 and placed into the CCR Operating Record.

The completed statistical evaluation identified Appendix III constituent pH below its lower prediction limit in monitoring well MW-901. The lower prediction limit for pH in monitoring well MW-901 is 6.95 standard units (S.U.). The detection monitoring sample was reported at 6.77 S.U. The first verification sample was collected on January 9, 2018 with a result of 6.84 S.U., which is still below the lower prediction limit. Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for pH from monitoring well MW-901 exceeds its lower prediction limit and is a confirmed statistically significant decrease (SSD) below background. An SSD is similar to an SSI in that it indicates a statistically significant difference

from background (i.e., potential impact) when a bracketed (upper and lower) prediction limit is computed such as is done for pH.

Additionally, the completed statistical evaluation identified Appendix III constituent sulfate above its prediction limit in monitoring well MW-902. The prediction limit for sulfate in monitoring well MW-902 is 36 mg/L. The detection monitoring sample was reported at 36.5 mg/L. The first verification sample was collected on December 12, 2017 with a result of 36.1 mg/L. The second verification sample was collected on January 9, 2018 with a result of 37.9 mg/L. Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for sulfate from monitoring well MW-902 exceeds its prediction limit and is a confirmed SSI over background.

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 or an SSD. For the above identified SSD and SSI for the Bottom Ash Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate the above SSI and SSD are not caused by a release from the Bottom Ash 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 the Bottom Ash Impoundment for the sampling event. Although the groundwater level in monitoring well MW-904 is lower than normal as compared to the other system wells, the flow directions indicated for the October 2017 groundwater monitoring event are typical. As seen in the map, monitoring well MW-901 is located upgradient from the Bottom Ash Impoundment indicating the SSD for pH is not caused by a release from the Bottom Ash Impoundment. This demonstrates that a source other than the Bottom Ash Impoundment caused the SSD below background levels for pH, or that the SSD 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 axes 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.

Although an SSD for pH was only identified in upgradient well MW-901 and the SSI for sulfate was only identified in well MW-902, the box and whiskers plot for pH and sulfate in MW-901 and MW-902 were compared to each other. Parts of Lake La Cygne surround the Bottom Ash Impoundment on three sides, including upgradient. The background sulfate concentration for Lake La Cygne as identified in an application for an NPDES permit modification dated September 16, 2016 was plotted alongside the sulfate data for comparison. The comparison indicates the pH levels in upgradient wells MW-901 and MW-902 are similar and sulfate concentrations in both MW-901 and MW-902 are below the background concentration for Lake La Cygne. This demonstrates that a source other than the Bottom Ash Impoundment caused the observed pH SSD below background and the observed sulfate SSI above background, or that the SSD and SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Box and whisker 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 monitoring wells MW-901 and MW-902 indicate pH levels for both wells are similar. Additionally, time series plots for sulfate concentrations for both wells when plotted along with the background sulfate concentration for Lake La Cygne indicate the well concentrations are less than the lake concentration. This demonstrates that a source other than the Bottom Ash Impoundment caused the observed pH SSD below background and the observed sulfate SSI above background, or that the SSD and 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 Bottom Ash Impoundment caused the SSD below background levels for pH, and SSI above background levels for sulfate, or that the SSD and 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 Bottom Ash 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 signature of the certifying registered geologist and professional engineer on this document represents that to the best of his knowledge, information, and belief in the exercise of his professional judgement in accordance with the standard of practice, it is his professional opinion that the aforementioned information is accurate as of the date of such signature. Any opinion or decisions by him are made on the basis of his 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 BOTTOM ASH IMPOUNDMENT)
- MW–901 (843.84) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- 823 GROUNDWATER SURFACE ELEVATIONS
- MW–904* INDICATES WELL NOT USED IN POTENTIOMETRIC SURFACE MAP CREATION

NOTES:

1. KDHE FACILITY PERMIT AREA BOUNDARY NOT 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.
4. GROUNDWATER ELEVATIONS PROVIDED BY AECOM□201□.

□. WATER LEVELS MEASURED OCTOBER 201□.

100 0 100 200

SCALE FEET

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

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (OCT 2017)
BOTTOM ASH IMPOUNDMENT

PROJECT TITLE
CCR 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:	Q/A REVW BY:
27217233.00	RCW	JRR
DSN'E BY:	CHK. BY:	PROJ. MGR
RCW	JRR	JRR

CADD FILE:
LA CYGNE BA IMP_CCR ASD_FIG 1.DWG

DATE:
4/16/18

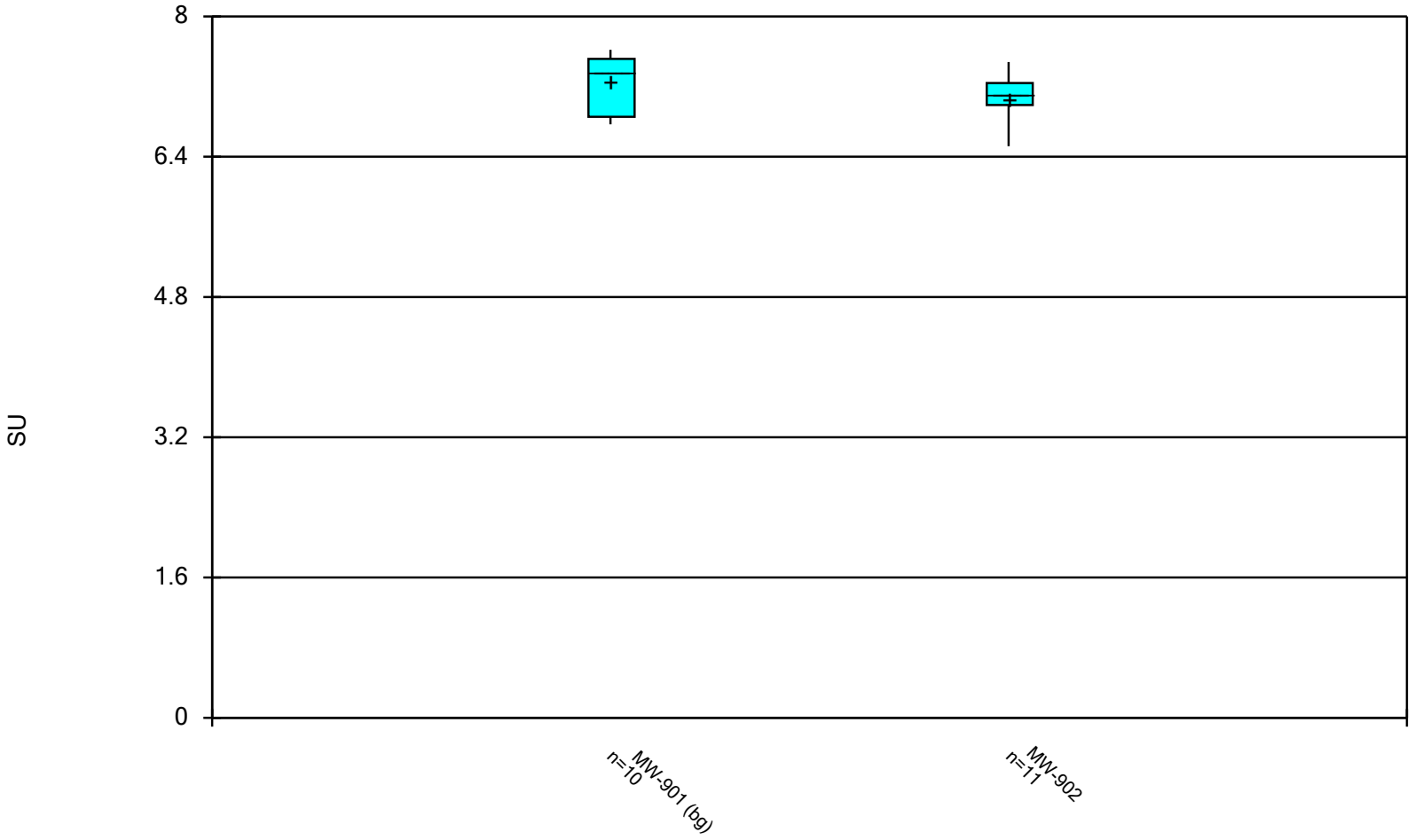
FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\2018\CCR ASD\La Cygne BA Imp_CCR ASD_Fig 1.dwg Apr 16, 2018 - 11:37am Layout Name: Fig 1 By: 4121rcw

Appendix B

Box and Whiskers Plots

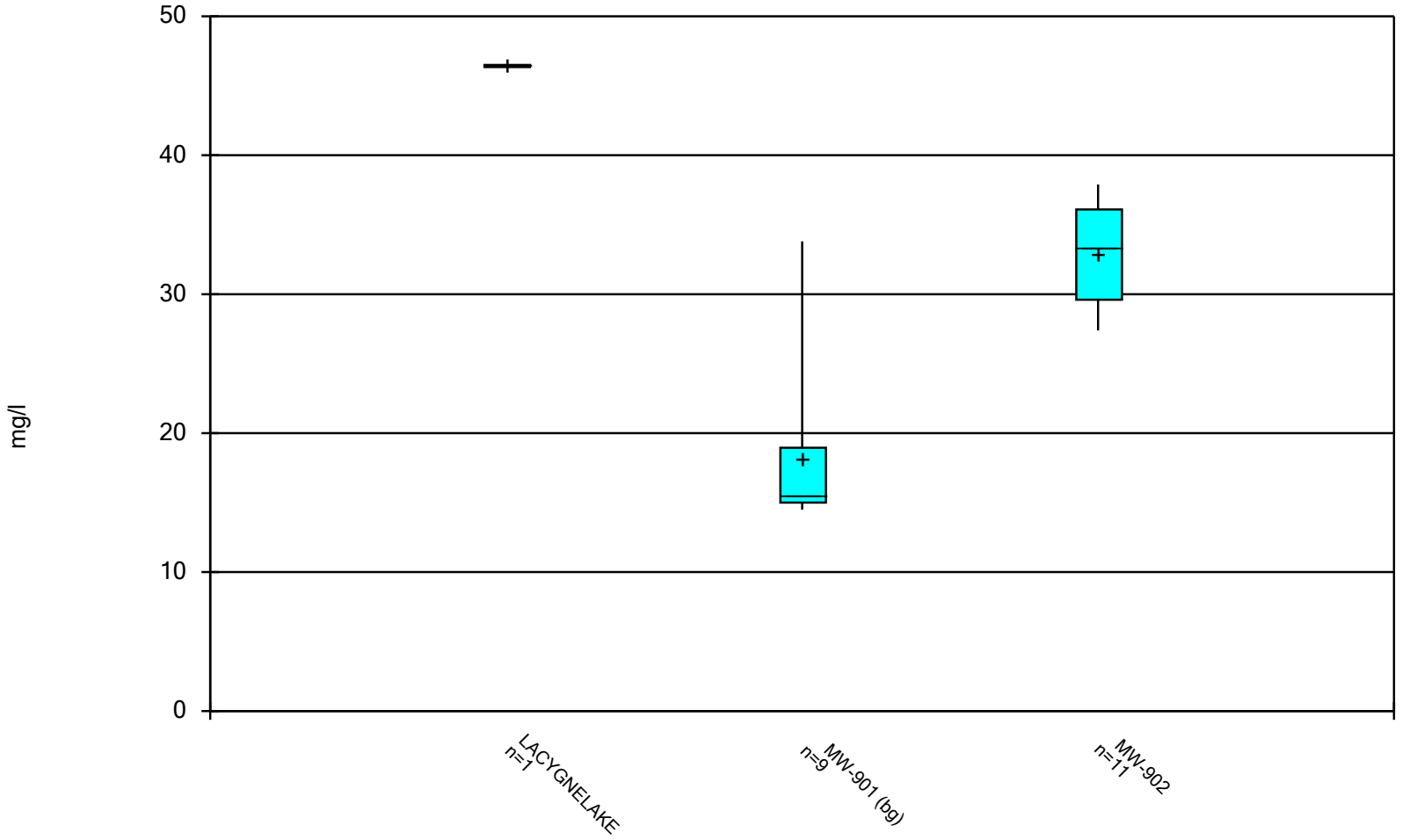
Box & Whiskers Plot



Constituent: pH Analysis Run 4/10/2018 4:38 PM View: CCR III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot



Constituent: SULFATE Analysis Run 4/10/2018 4:38 PM View: CCR III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

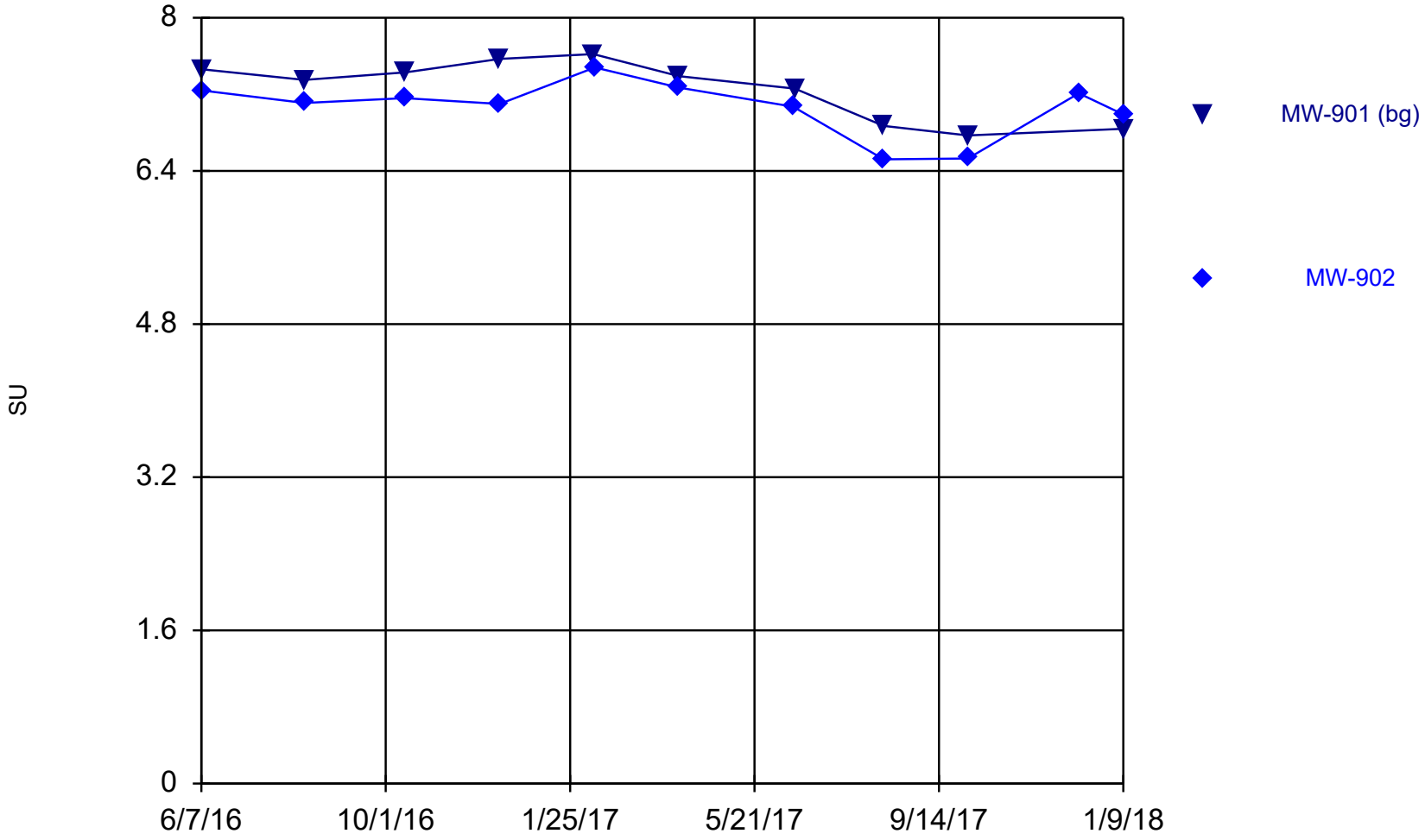
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 4/10/2018, 4:40 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
pH (SU)	MW-901 (bg)	10	7.26	0.314	0.0993	7.37	6.77	7.62	0
pH (SU)	MW-902	11	7.06	0.294	0.0888	7.11	6.52	7.48	0
SULFATE (mg/l)	LACYGNELAKE	1	46.5	0	0	46.5	46.5	46.5	0
SULFATE (mg/l)	MW-901 (bg)	9	18.3	6.06	2.02	15.6	14.5	33.8	0
SULFATE (mg/l)	MW-902	11	32.9	3.35	1.01	33.3	27.4	37.9	0

Appendix C

Time Series Plots

Time Series



Constituent: pH Analysis Run 4/11/2018 3:17 PM View: Bottom Ash III

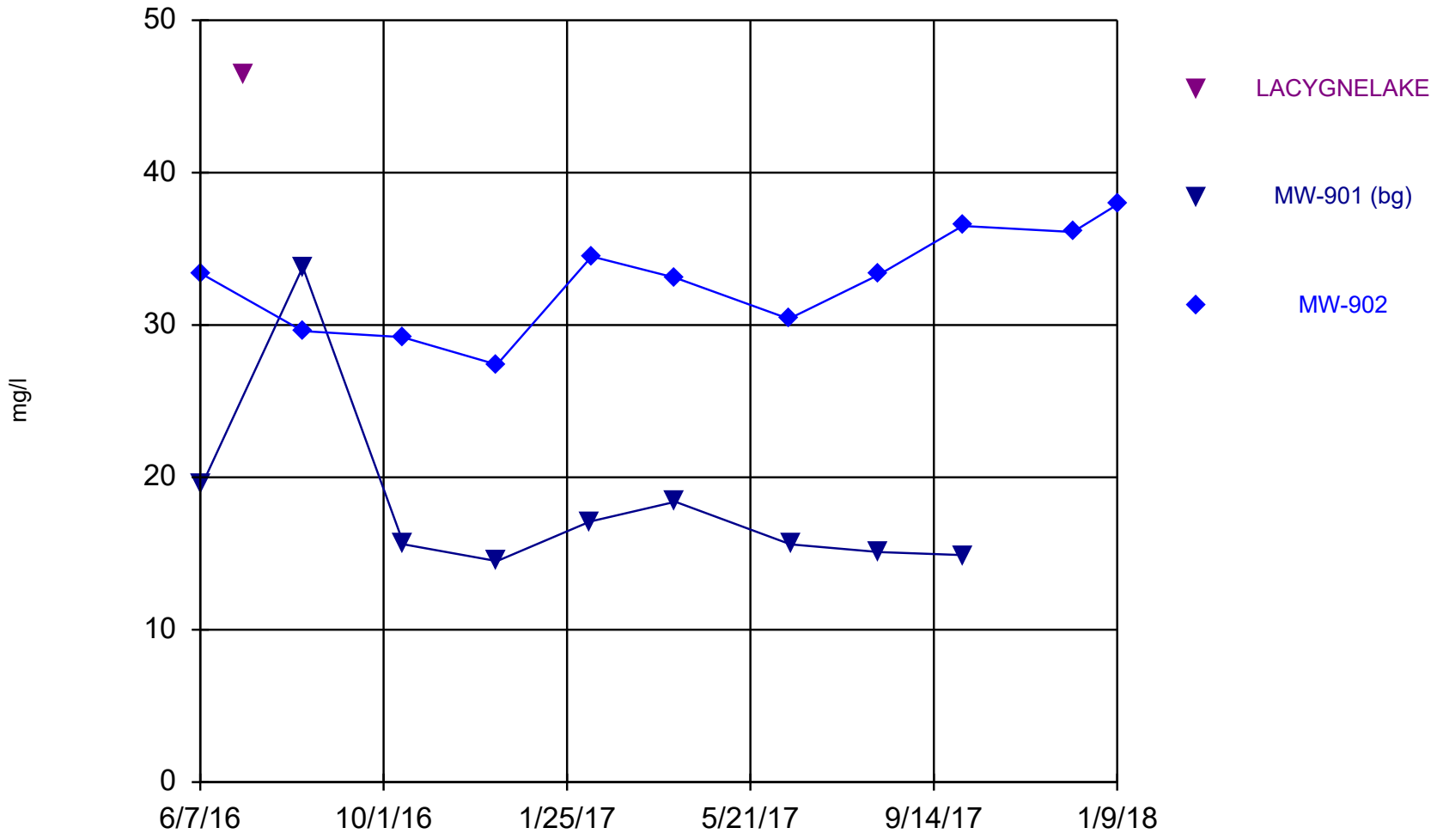
LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: pH (SU) Analysis Run 4/11/2018 3:17 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901 (bg)	MW-902
6/7/2016		7.24
6/8/2016	7.46	
8/11/2016	7.35	7.11
10/13/2016		7.16
10/14/2016	7.43	
12/12/2016	7.57	7.1
2/9/2017	7.62	
2/10/2017		7.48
4/4/2017	7.39	7.27
6/15/2017		7.07
6/16/2017	7.26	
8/11/2017	6.87	6.52
10/3/2017	6.77	6.53
12/12/2017		7.21
1/9/2018	6.84	6.99

Time Series



Constituent: SULFATE Analysis Run 4/11/2018 3:17 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: SULFATE (mg/l) Analysis Run 4/11/2018 3:17 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	LACYGNELAKE	MW-901 (bg)	MW-902
6/7/2016			33.4
6/8/2016		19.5	
7/5/2016	46.5		
8/11/2016		33.8	29.6
10/13/2016			29.2
10/14/2016		15.6	
12/12/2016		14.5	27.4
2/9/2017		17.1	
2/10/2017			34.5
4/4/2017		18.4	33.1
6/15/2017			30.4
6/16/2017		15.6	
8/11/2017		15.1	33.3
10/3/2017		14.9	36.5
12/12/2017			36.1
1/9/2018			37.9

C.2. Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event

CCR GROUNDWATER MONITORING

ALTERNATIVE SOURCE DEMONSTRATION REPORT

May 2018 GROUNDWATER MONITORING EVENT

BOTTOM ASH 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

November 2018

File No. 27217233.18

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 Bottom Ash 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 Bottom Ash 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 alternate 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 Bottom Ash Impoundment at Kansas City Power & Light Company's (KCP&L) La Cygne Generating Station has been completed in substantial compliance with the "Statistical Method Certification by a Qualified Professional Engineer" document dated October 12, 2017. Detection monitoring groundwater samples were collected on May 23, 2018. Review and validation of the results from the May 2018 Detection Monitoring Event was completed on June 15, 2018, 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 11, 2018 and August 16, 2018.

If an SSI is preliminarily identified by the prediction limit analysis, verification retesting is performed in accordance with the certified statistical method and the resampling plan to verify the result is not due to an error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Up to two rounds of verification sampling and retesting may be conducted. Verification retesting with a "1 of 2" or "1 of 3" resampling plan is performed by collecting a verification sample(s) and comparing it to the calculated prediction limit. If the resulting concentration of any verification sample is not above the prediction limit, then an SSI is not confirmed.

Determinations of SSIs for the Bottom Ash Impoundment at the La Cygne Generating Station were completed September 12, 2018 and placed into the CCR Operating Record.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903. The prediction limit for calcium in monitoring well MW-903 is 358 milligrams per liter (mg/L). The detection monitoring sample was reported at 368 mg/L. The first verification re-sample was collected on July 11, 2018 with a result of 371 mg/L. The second verification re-sample was collected on August 16, 2018 with a result of 382 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for calcium from monitoring wells MW-903 exceeds its prediction limit and is a confirmed 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 one SSI above the background prediction limit for calcium in monitoring well MW-903.

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 or an SSD. For the above identified SSI for the Bottom Ash Impoundment at the La Cygne Generating Station, there are multiple lines of supporting evidence to indicate the SSI was not caused by a release from the Bottom Ash Impoundment. Select multiple lines of supporting evidence are described as follows.

3.1 BOTTOM ASH SPLP ANALYSIS

The Synthetic Precipitation Leaching Procedure (SPLP) is an Environmental Protection Agency (EPA) approved extraction procedure designed to simulate and then analyze leachate, which would be produced from rainfall passing through a contaminated material (assuming the rainfall is slightly acidic). The SPLP is used to assess the potential of a contaminated material (in or on top of the ground) to impact groundwater (or surface water), when exposed to normal weathering. A bottom ash sample was collected on September 17, 2018 and submitted to the laboratory for SPLP analysis for calcium. The calcium result for the SPLP extract (simulated leachate) was 73.7 mg/L. The prediction limit for calcium in monitoring well MW-903 is 358 mg/L and the detection monitoring sample was reported at 368 mg/L. The calcium concentration in the groundwater from MW-903 is significantly greater than what would be expected from bottom ash leachate. The comparison indicates the elevated calcium concentrations in monitoring well MW-903 are not from bottom ash leachate but from a source other than bottom ash, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. The laboratory report is provided in **Appendix A.**

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 axes 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.

Based on the bottom ash SPLP calcium analysis compared to the calcium results for MW-903, the calcium levels for additional wells at the LaCygne Generating Station (not part of the CCR Bottom Ash groundwater monitoring system) were reviewed for elevated calcium levels to determine if elevated calcium concentrations could occur naturally in the vicinity of the facility and if natural variability

between wells occurred in the vicinity of the facility. Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Box and whiskers plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located close to MW-13 indicating natural variability of calcium over short distances occurs at the site. The comparison indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the facility site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, 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.

Four wells were identified as exhibiting elevated calcium and one of them was an upgradient well. Of the four wells exhibiting elevated calcium, one well, MW-903 also exhibited an SSI. Time series plots for calcium for upgradient monitoring wells MW-13 and MW-602 and downgradient wells MW-707B, MW-805, and MW-903 were prepared for comparison. Upgradient monitoring well MW-602 does not have elevated calcium but is located close to MW-13 indicating natural variability of calcium over short distances occurs at the site. The comparison indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the site and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Time series plots are provided in **Appendix C**.

3.4 PIPER 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 analysis. 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 a sample from MW-903 and a sample from MW-13 (upgradient well for the CCR Landfill and Lower AQC) are provided in **Appendix D.** The samples plot near one another in

the same hydrochemical facies indicating similar geochemical characteristics between an upgradient well in the vicinity of the facility and a downgradient well for the Bottom Ash Impoundment. The comparison indicates the hydrochemical characteristics (particularly calcium) of groundwater from monitoring well MW-903 are similar to the hydrochemical characteristics (particularly calcium) of background groundwater and are in the range as that of an upgradient well at the facility and that significant natural variability occurs between wells and across the site. This demonstrates that a source other than the bottom ash caused the SSI above background levels for calcium, 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 D**.

3.5 FACILITY WIDE INTERWELL PREDICTION LIMIT

Because of known complexities and heterogeneities of the water bearing zone at the facility, an intrawell prediction limit analysis with retesting was the selected statistical method for the Bottom Ash Impoundment. However, false positives (SSIs) may occur due to a limited background data set that may not truly represent the background population for that particular well until the number of background observations are increased to better represent the entire population. The CCR Rule preamble recommends a minimum of eight to ten independent background observations be collected before performing the first statistical test; but also states that background sample sets of at least 20 are considered optimal. To further demonstrate that an interwell prediction limit exceedance (SSI) could be naturally occurring and likely the result of a limited background data set for a particular well, an interwell prediction limit analysis on a facility wide basis can be useful to further demonstrate natural variability across a site or in the vicinity of the site and that the potential true background population may not be represented.

An interwell prediction limit analysis on a facility wide basis was performed comparing the calcium concentration in MW-903 to the prediction limit calculated from the combined background calcium data from all of the background monitoring wells across the facility. The facility wide interwell prediction limit for calcium is 395 mg/L. The highest calcium concentration from MW-903 is 384 mg/L, which is below the facility wide interwell prediction limit for calcium. The interwell prediction limit analysis further indicates the calcium levels in monitoring well MW-903 are within the range of calcium concentrations in upgradient wells at the facility site. This demonstrates that a source other than the bottom ash could cause the SSI above background levels for calcium, or that the SSI resulted from error in sampling, analysis, statistical evaluation, or natural variation in groundwater quality. Facility wide interwell prediction limit outputs are provided in **Appendix E**.

4 CONCLUSION

Our opinion is that a sufficient body of evidence is available and presented above to demonstrate that a source other than the Bottom Ash Impoundment caused the SSI above background levels for calcium, 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 Bottom Ash 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 signature of the certifying registered geologist and professional engineer on this document represents that to the best of their knowledge, information, and belief in the exercise of his professional judgement in accordance with the standard of practice, it is his professional opinion 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 his 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

Bottom Ash SPLP Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

October 01, 2018

SCS Engineers - KS

Sample Delivery Group:	L1027123
Samples Received:	09/19/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To: Jason Franks
8575 West 110th Street
Suite 100
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

BOTTOM ASH L1027123-01 GW

Collected by	Collected date/time	Received date/time
Jason R Franks	09/17/18 12:00	09/19/18 11:50

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Preparation by Method 1312	WG1169395	1	09/21/18 11:47	09/21/18 11:47	TM
Wet Chemistry by Method 9056A	WG1169693	1	09/24/18 20:14	09/24/18 20:14	NJM
Metals (ICP) by Method 6010B	WG1170271	1	09/23/18 09:55	09/23/18 22:31	CCE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Preparation by Method 1312

Analyte	Result	Qualifier	Prep date / time	Batch
SPLP Extraction	-		9/21/2018 11:47:27 AM	WG1169395

Wet Chemistry by Method 9056A

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Chloride	ND		1000	1	09/24/2018 20:14	WG1169693
Fluoride	118		100	1	09/24/2018 20:14	WG1169693
Sulfate	51100		5000	1	09/24/2018 20:14	WG1169693

Metals (ICP) by Method 6010B

Analyte	Result ug/l	Qualifier	RDL ug/l	Dilution	Analysis date / time	Batch
Boron	959		200	1	09/23/2018 22:31	WG1170271
Calcium	73700		1000	1	09/23/2018 22:31	WG1170271

Method Blank (MB)

(MB) R3344732-1 09/24/18 17:59

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1027594-11 Original Sample (OS) • Duplicate (DUP)

(OS) L1027594-11 09/24/18 22:52 • (DUP) R3344732-4 09/24/18 23:07

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	244	184	1	27.8	J P1	15
Sulfate	U	0.000	1	0.000		15

L1027715-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1027715-01 09/25/18 01:45 • (DUP) R3344732-7 09/25/18 02:00

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8430	8420	1	0.118		15
Sulfate	8690	8710	1	0.147		15

L1027594-11 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1027594-11 09/24/18 22:52 • (MS) R3344732-5 09/24/18 23:21 • (MSD) R3344732-6 09/24/18 23:36

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	244	50900	51100	101	102	1	80.0-120			0.435	15
Sulfate	50000	U	51800	51400	104	103	1	80.0-120			0.729	15

L1027715-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1027715-01 09/25/18 01:45 • (MS) R3344732-8 09/25/18 02:14

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	8430	59200	102	1	80.0-120	
Sulfate	50000	8690	59100	101	1	80.0-120	

Method Blank (MB)

(MB) R3344358-1 09/23/18 21:58

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3344358-2 09/23/18 22:01 • (LCSD) R3344358-3 09/23/18 22:03

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	992	995	99.2	99.5	80.0-120			0.340	20
Calcium	10000	10000	9930	100	99.3	80.0-120			0.917	20

L1026826-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1026826-01 09/23/18 22:06 • (MS) R3344358-5 09/23/18 22:12 • (MSD) R3344358-6 09/23/18 22:14

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	155	1170	1170	101	102	1	75.0-125			0.133	20
Calcium	10000	43500	53700	53700	102	102	1	75.0-125			0.0395	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

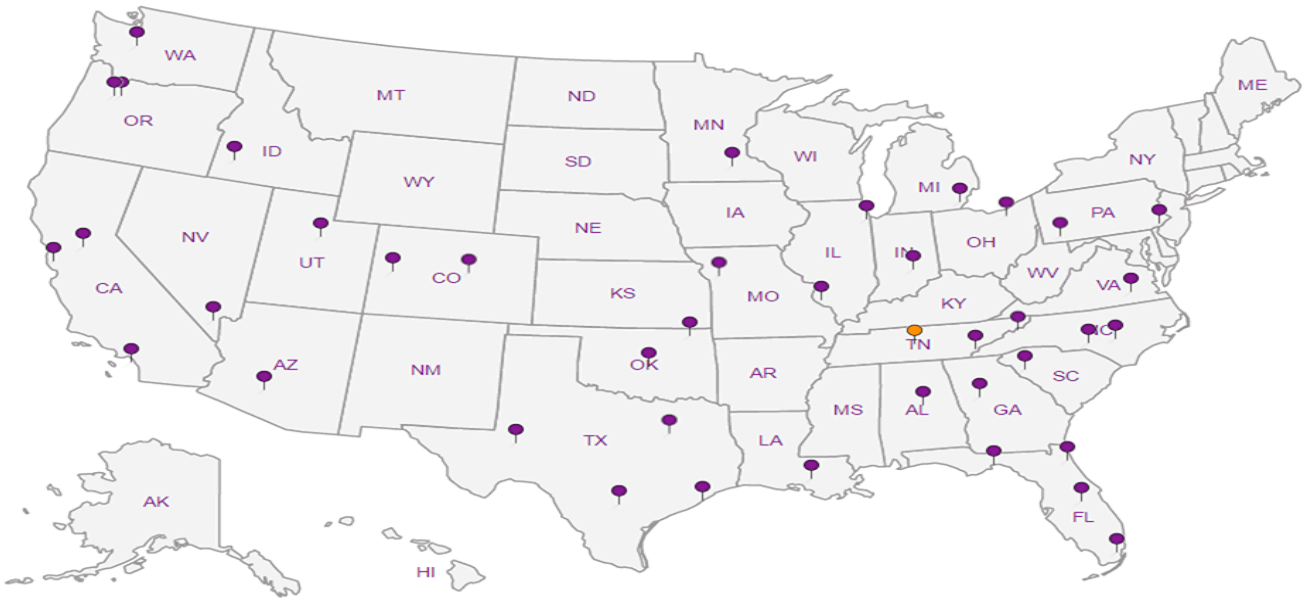
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS

8575 West 110th Street
Suite 100
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 West 110th Street
Suite 100
Overland Park, KS 66210

Pres Chk

Report to: **Jason Franks**

Email To: **jfranks@scsengineers.com; jay.martin@kcpl.com;**

Project Description: **KCPL - LaCygne Generating Station**

City/State Collected: **LaCygne, KS**

Phone: **913-681-0030**
Fax: **913-681-0012**

Client Project # **27217233.18**

Lab Project # **AQUAOPKS-LACYGNE**

Collected by (print): **JASON R. FRANKS**

Site/Facility ID #

P.O. #

Collected by (signature): **Jason R. Franks**

Immediately Packed on Ice N ___ Y ✓

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Date Results Needed

Quote #

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	SPLP metals / anions 16oz Clr-NoPres										Remarks	Sample # (lab only)
BOTTOM ASH	GRAB	SS	—	9/17/18	1200	1	X											-01

Analysis / Container / Preservative

Chain of Custody Page 1 of 1

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1027123
E242

Acctnum: **AQUAOPKS**
Template: **T140691**
Prelogin: **P672563**
TSR: **206 - Jeff Carr**
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: SPLP - Extract for B, Ca, Cl, Fl, and SO4

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Jason R. Franks	9/18/18	1500	9-18-18 1505
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			801

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 1.6 °C Bottles Received: 1

Date: 9/19/18 Time: 1150

If preservation required by Login: Date/Time

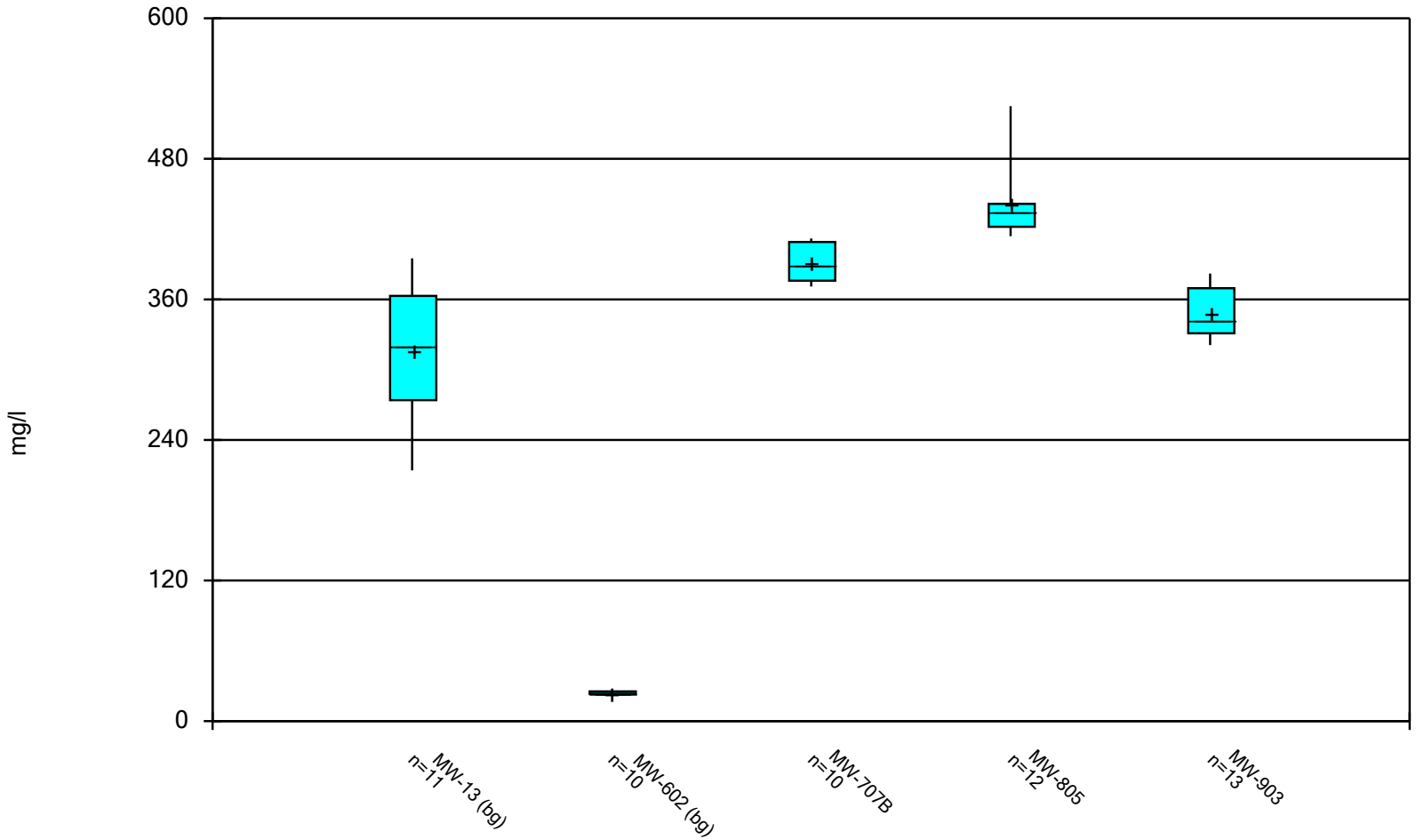
Hold:

Condition: NCF / (OK)

Appendix B

Box and Whiskers Plots

Box & Whiskers Plot



Constituent: CALCIUM Analysis Run 11/14/2018 5:04 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Box & Whiskers Plot

Constituent: CALCIUM (mg/l) Analysis Run 11/14/2018 5:05 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016			408	422	
10/13/2016	395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017				525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376
Median	320	24.4	389	435	342
LowerQ.	274	23.3	376	422	331
UpperQ.	363	25.3	409	442	370
Min	214	22.9	371	414	321
Max	395	25.7	412	525	382
Mean	316	24.3	391	441	348

Box & Whiskers Plot

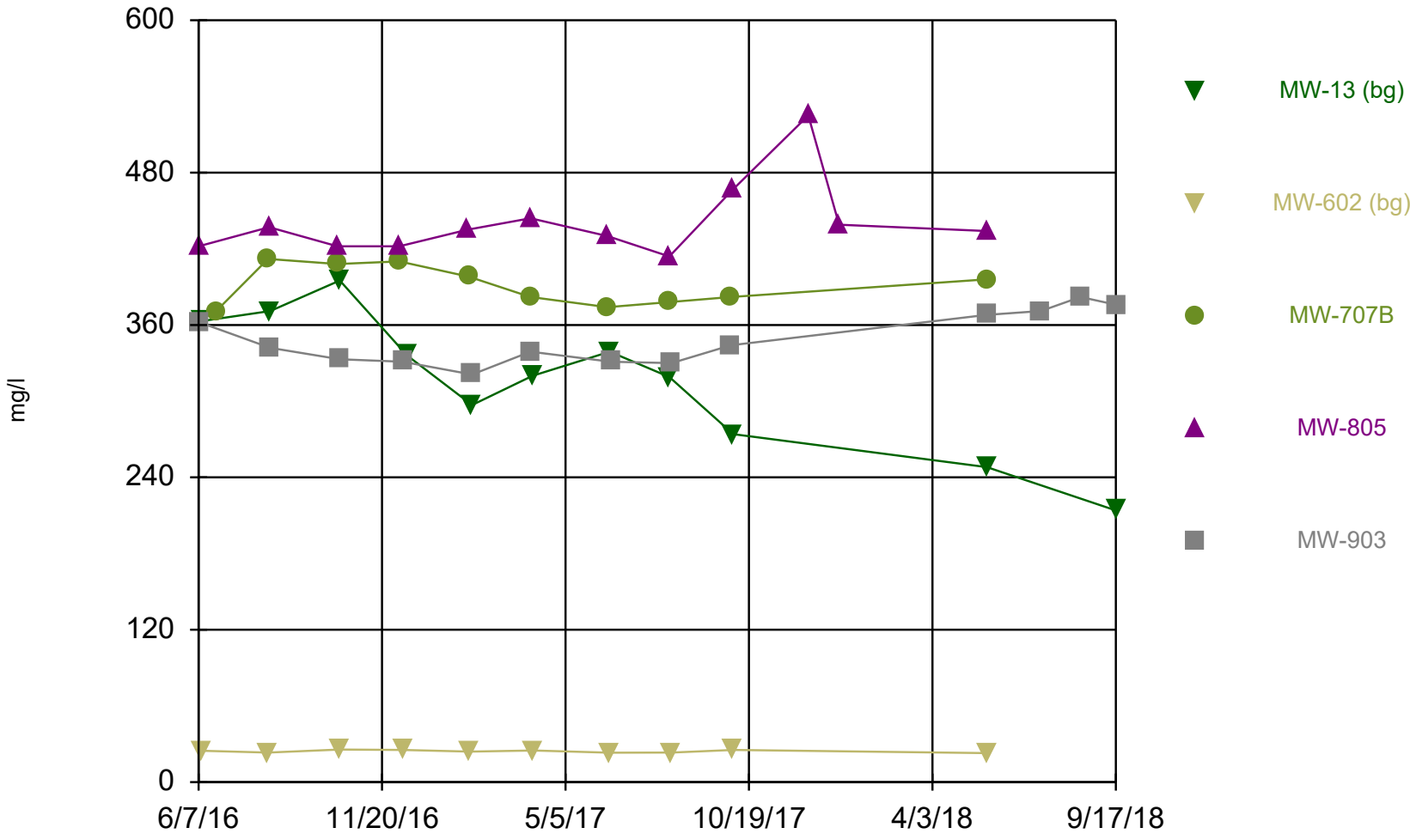
LaCygne Client: SCS Engineers Data: LaC GW Data Printed 11/14/2018, 5:05 PM

Constituent	Well	N	Mean	Std. Dev.	Std. Err.	Median	Min.	Max.	%NDs
CALCIUM (mg/l)	MW-13 (bg)	11	316	54.4	16.4	320	214	395	0
CALCIUM (mg/l)	MW-602 (bg)	10	24.3	1.04	0.329	24.4	22.9	25.7	0
CALCIUM (mg/l)	MW-707B	10	391	15.6	4.93	389	371	412	0
CALCIUM (mg/l)	MW-805	12	441	29.8	8.61	435	414	525	0
CALCIUM (mg/l)	MW-903	13	348	20.5	5.69	342	321	382	0

Appendix C

Time Series Plots

Time Series



Constituent: CALCIUM Analysis Run 11/14/2018 5:05 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Time Series

Constituent: CALCIUM (mg/l) Analysis Run 11/14/2018 5:06 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

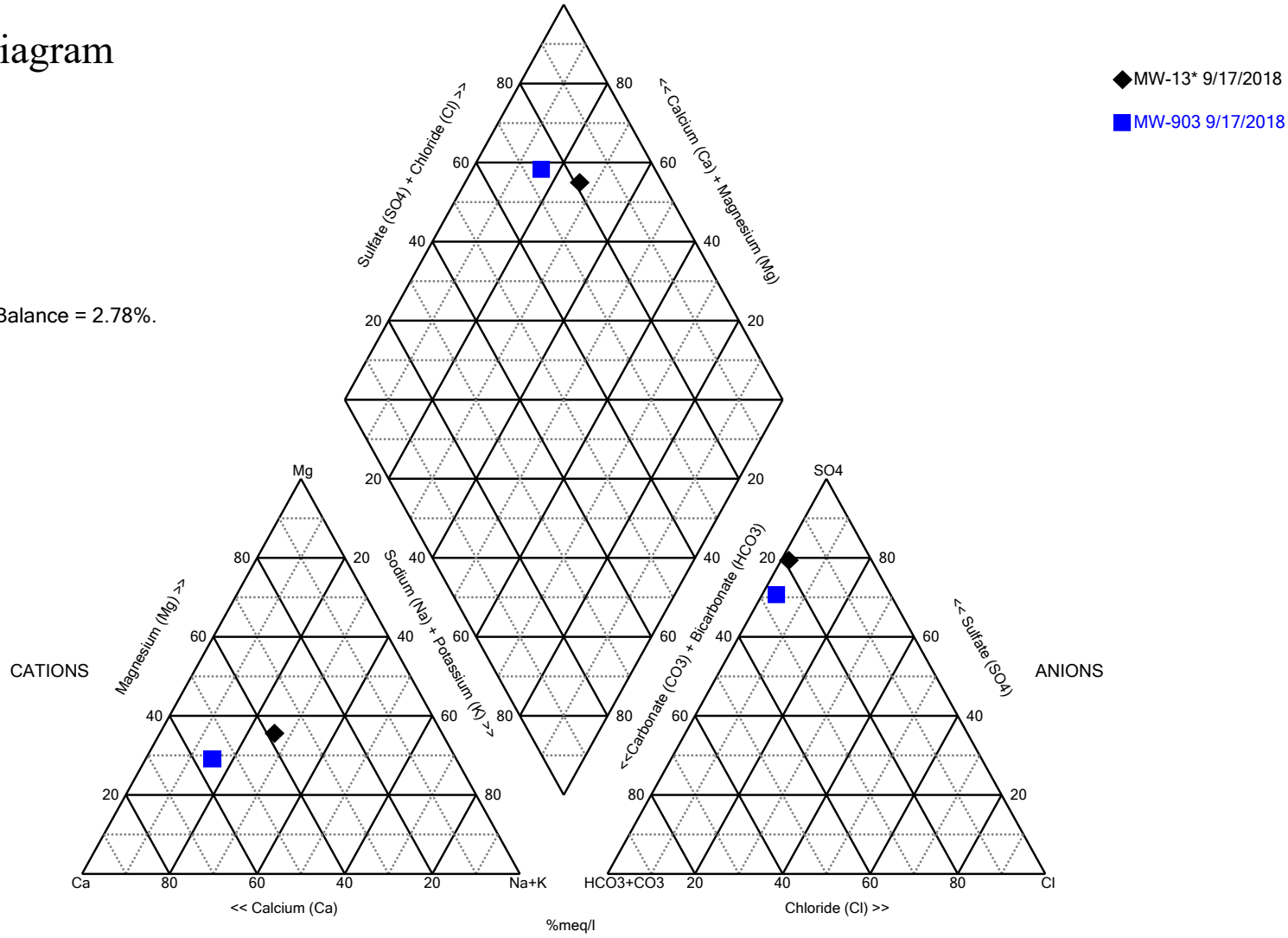
	MW-13 (bg)	MW-602 (bg)	MW-707B	MW-805	MW-903
6/7/2016				422	
6/8/2016					362
6/9/2016	363				
6/10/2016		24.7			
6/23/2016			371		
8/9/2016		23.3	412		
8/10/2016				437	
8/11/2016	371				342
10/11/2016			408	422	
10/13/2016	395	25.7			333
12/6/2016			410	422	
12/9/2016		25.3			331
12/13/2016	336				
2/6/2017				435	
2/7/2017			398		
2/8/2017		24			
2/10/2017	297				321
4/4/2017			382	444	339
4/6/2017	320				
4/7/2017		24.9			
6/13/2017			374	430	
6/15/2017	339	23.2			
6/16/2017					331
8/8/2017	319		378	414	
8/10/2017		23.3			330
10/3/2017			382		344
10/5/2017	274	25.3		467	
12/12/2017				525	
1/9/2018				439	
5/23/2018	248	22.9		434	368
5/24/2018			396		
7/11/2018					371
8/16/2018					382
9/17/2018	214				376

Appendix D

Piper Diagrams

Piper Diagram

Cation-Anion Balance = 2.78%.



Analysis Run 11/15/2018 5:20 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

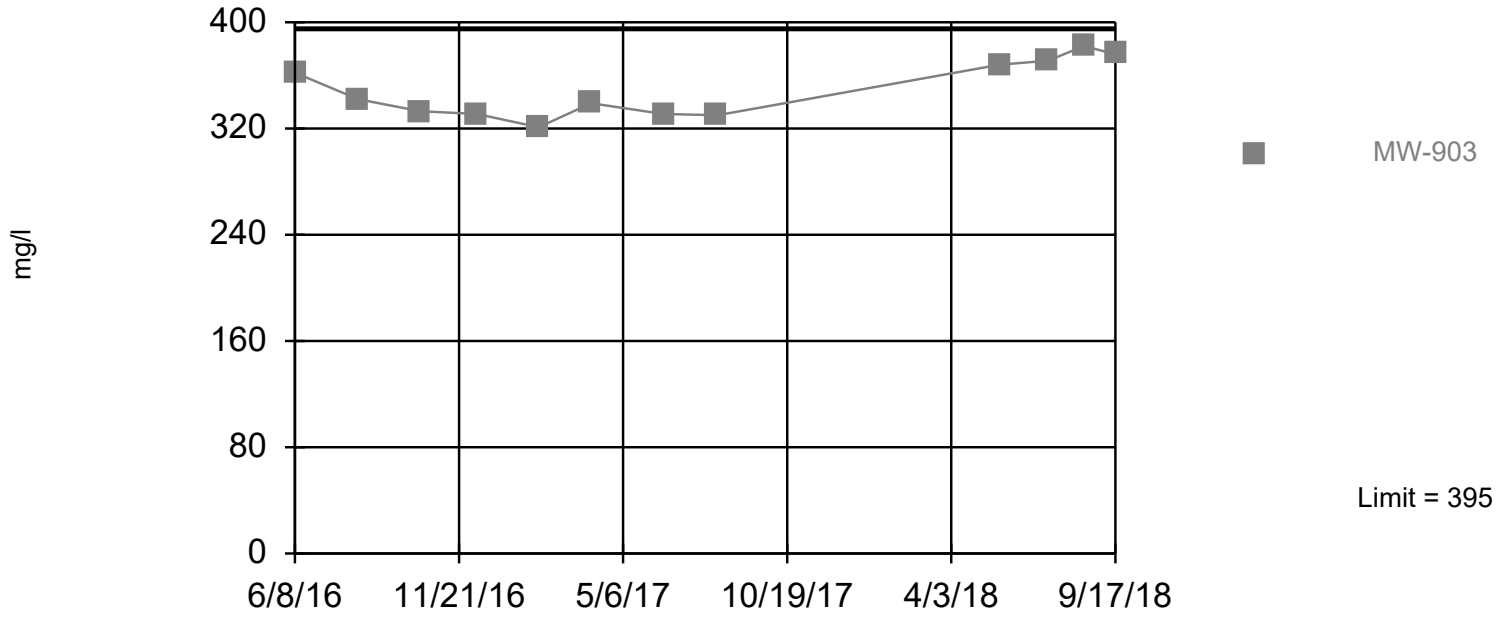
Appendix E

Facility Wide Interwell Prediction Limits

Within Limit

Prediction Limit

Interwell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because the Shapiro Francia normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 73 background values. Annual per-constituent alpha = 0.000029. Individual comparison alpha = 0.0000145 (1 of 3). Seasonality was not detected with 95% confidence.

Constituent: CALCIUM Analysis Run 11/16/2018 11:48 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 11/16/2018 11:51 AM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-10 (bg)	MW-703 (bg)	MW-701 (bg)	MW-901 (bg)	MW-702 (bg)	MW-903	MW-13 (bg)	MW-601 (bg)	MW-602 (bg)
6/6/2016	60.1								
6/7/2016		22	39.6						
6/8/2016				57.2	17.3	362			
6/9/2016							363	21.7	
6/10/2016									24.7
8/9/2016		17.9	35.3		11.2			20.3	23.3
8/11/2016	58.7			53.9		342	371		
10/11/2016		20.5	37.2		14.9				
10/12/2016	60.7								
10/13/2016						333	395	23.9	25.7
10/14/2016				52.1					
12/6/2016		19.8	37.2						
12/7/2016								22.5	
12/8/2016					19.4				
12/9/2016	59					331			25.3
12/12/2016				56.9					
12/13/2016							336		
2/7/2017		17.7	37.4						
2/8/2017	58.8				18.1			20.1	24
2/9/2017				55.7					
2/10/2017						321	297		
4/4/2017		22.4	36.3	57.6		339			
4/5/2017					18.5				
4/6/2017	57.4						320	21.3	
4/7/2017									24.9
6/13/2017			36.1						
6/14/2017		17.4							
6/15/2017	55.5				15.1		339	22	23.2
6/16/2017				56.7		331			
8/8/2017			36.3				319		
8/9/2017					20.3			20.9	
8/10/2017	56.1	17.5				330			23.3
8/11/2017				56					
5/23/2018	54.1			57.1		368	248	17.6	22.9
5/24/2018		21.8	39.5		7.13				
7/11/2018						371			
8/16/2018						382			
9/17/2018						376	214		

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 11/16/2018, 11:51 AM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
CALCIUM (mg/l)	MW-903	395	n/a	9/17/2018	376	No	73	0	n/a	0.000...	NP Inter (normality) ...

C.3 Supplemental Data, Groundwater Monitoring Alternative Source Demonstration Report May 2018 Groundwater Monitoring Event

Piper Diagram

Analysis Run 1/24/2019 6:36 PM View: Bottom Ash 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-903 9/17/2018	116	6.47	376	117	26.1	1070	497	10

ADDENDUM 1

2018 Annual Groundwater Monitoring and Corrective Action Report Addendum 1

December 16, 2022
File No. 27217233.18

To: Evergy Metro, Inc.
Jared Morrison – Director, Water and Waste Programs

From: SCS Engineers
Douglas L. Doerr, P.E.
John R. Rockhold, P.G.

Subject: 2018 Annual Groundwater Monitoring and Corrective Action Report Addendum 1
Evergy Metro, Inc.
Bottom Ash Impoundment
La Cygne Generating Station - La Cygne, Kansas

The Bottom Ash Impoundment at the La Cygne Generating Station are subject to the groundwater monitoring and corrective action requirements of the "Coal Combustion Residuals (CCR) Final Rule" (Rule); as described in CFR 40 257.90 through CFR 40 257.98. An Annual Groundwater Monitoring and Corrective Action (GWMCA) Report documenting activities completed in 2018 for the Bottom Ash Impoundment was completed and placed in the facility's operating record on January 30, 2019, as required by the Rule. The Annual GWMCA report was to fulfill the requirements specified in 40 CFR 257.90(e).

This Addendum has been prepared to supplement the operating record in recognition of comments received by Evergy from the U.S. Environmental Protection Agency (USEPA) on January 11, 2022. In addition to the information listed in 40 CFR 257.90(e), the USEPA indicated in their comments that the GWMCA Report contain the following:

- Results of laboratory analysis of groundwater or other environmental media samples for 40 CFR 257 Appendix III and Appendix IV constituents or other constituents, such as those supporting characterization of site conditions that may ultimately affect a remedy.
- Required statistical analysis performed on laboratory analysis results; and
- Calculated groundwater flow rate and direction.

This information is not specifically referred to in 40 CFR 257.90(e) for inclusion in the GWMCA Reports; however, it is routinely collected, determined and maintained in Evergy's files and is being provided in the attachments to this addendum.

The attachments to this addendum are as follows:

- Attachment 1 – Laboratory Analytical Reports:

  Includes laboratory data packages with supporting information such as case narrative, sample and method summary, analytical results, quality control, and chain-of-custody documentation. The laboratory data packages for the following sampling events are provided:

  - January 2018 – Second verification sampling for the Fall 2017 detection monitoring sampling event.
  - May 2018 – Spring 2018 semiannual detection monitoring sampling event.
  - July 2018 – First verification sampling for the Spring 2018 detection monitoring sampling event.
  - August 2018 - Second verification sampling for the Spring 2018 detection monitoring sampling event.
  - November 2018 - Fall 2018 semiannual detection monitoring sampling event.

- Attachment 2 - Statistical Analyses:

  Includes summary of statistical results, prediction limit plots, prediction limit background data, detection sample results, first and second verification re-sample results (when applicable), extra sample results for pH (collected as part of the approved sampling procedures), input parameters, and a Prediction Limit summary table. Statistical analyses completed in 2018 included the following:

  - Fall 2017 semiannual detection monitoring statistical analyses.
  - Spring 2018 semiannual detection monitoring statistical analyses.

- Attachment 3 - Revised Groundwater Potentiometric Surface Maps:

  Includes revised groundwater potentiometric surface maps with the measured groundwater elevations at each well and the generalized groundwater flow direction and the calculated groundwater flow rate. Maps for the following sampling events are provided:

  - May 2018 - Spring 2018 semiannual detection monitoring sampling event.
  - November 2018 - Fall 2018 semiannual detection monitoring sampling event.

Jared Morrison
December 16, 2022

ATTACHMENT 1

Laboratory Analytical Reports

Jared Morrison
December 16, 2022

ATTACHMENT 1-1

January 2018 Sampling Event Laboratory Report

ANALYTICAL REPORT

January 11, 2018

AECOM - Kansas City, MO

Sample Delivery Group:	L962121
Samples Received:	01/10/2018
Project Number:	60482842
Description:	La Cygne Generating Station
Site:	TASK 100
Report To:	Alla Skaskevych 2380 McGee Suite 200 Kansas City, MO 64108

Entire Report Reviewed By:

Jeff Carr
Technical Service Representative

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by ESC is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-902 L962121-01 GW

Collected by: Terry Andrews
Collected date/time: 01/09/18 11:50
Received date/time: 01/10/18 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1061236	1	01/10/18 19:02	01/10/18 19:02	DR

MW-805 L962121-02 GW

Collected by: Terry Andrews
Collected date/time: 01/09/18 12:45
Received date/time: 01/10/18 09:15

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICPMS) by Method 6020	WG1061246	1	01/10/18 10:53	01/10/18 14:01	JPD

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Technical Service Representative

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Sulfate	37.9		5.00	1	01/10/2018 19:02	WG1061236

Metals (ICPMS) by Method 6020

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	mg/l		mg/l		date / time	
Calcium	439		1.00	1	01/10/2018 14:01	WG1061246

Method Blank (MB)

(MB) R3278661-1 01/10/18 06:59

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Sulfate	U		0.0774	5.00

L962121-01 Original Sample (OS) • Duplicate (DUP)

(OS) L962121-01 01/10/18 19:02 • (DUP) R3278661-7 01/10/18 19:16

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	37.9	37.9	1	0.0427		15

L962047-01 Original Sample (OS) • Duplicate (DUP)

(OS) L962047-01 01/10/18 21:42 • (DUP) R3278661-9 01/10/18 21:56

Analyte	Original Result mg/l	DUP Result mg/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	ND	0.674	1	0		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3278661-2 01/10/18 07:14 • (LCSD) R3278661-3 01/10/18 07:28

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Sulfate	40.0	39.8	39.8	99.5	99.4	80-120			0.127	15

L962047-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L962047-01 01/10/18 21:42 • (MS) R3278661-5 01/10/18 13:16 • (MSD) R3278661-6 01/10/18 13:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Sulfate	50.0	ND	52.2	52.6	103	104	1	80-120			0.814	15

L962121-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L962121-01 01/10/18 19:02 • (MS) R3278661-8 01/10/18 19:31

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Sulfate	50.0	37.9	87.3	98.7	1	80-120	

Method Blank (MB)

(MB) R3278574-1 01/10/18 13:34

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Calcium	U		0.046	1.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3278574-2 01/10/18 13:38 • (LCSD) R3278574-3 01/10/18 13:41

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Calcium	5.00	4.88	4.89	97.7	97.9	80-120			0.177	20

L961908-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L961908-01 01/10/18 13:45 • (MS) R3278574-5 01/10/18 13:53 • (MSD) R3278574-6 01/10/18 13:57

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Calcium	5.00	66.8	72.3	73.0	108	123	1	75-125			1.03	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description

The remainder of this page intentionally left blank, there are no qualifiers applied to this SDG.

ACCREDITATIONS & LOCATIONS

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Connecticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

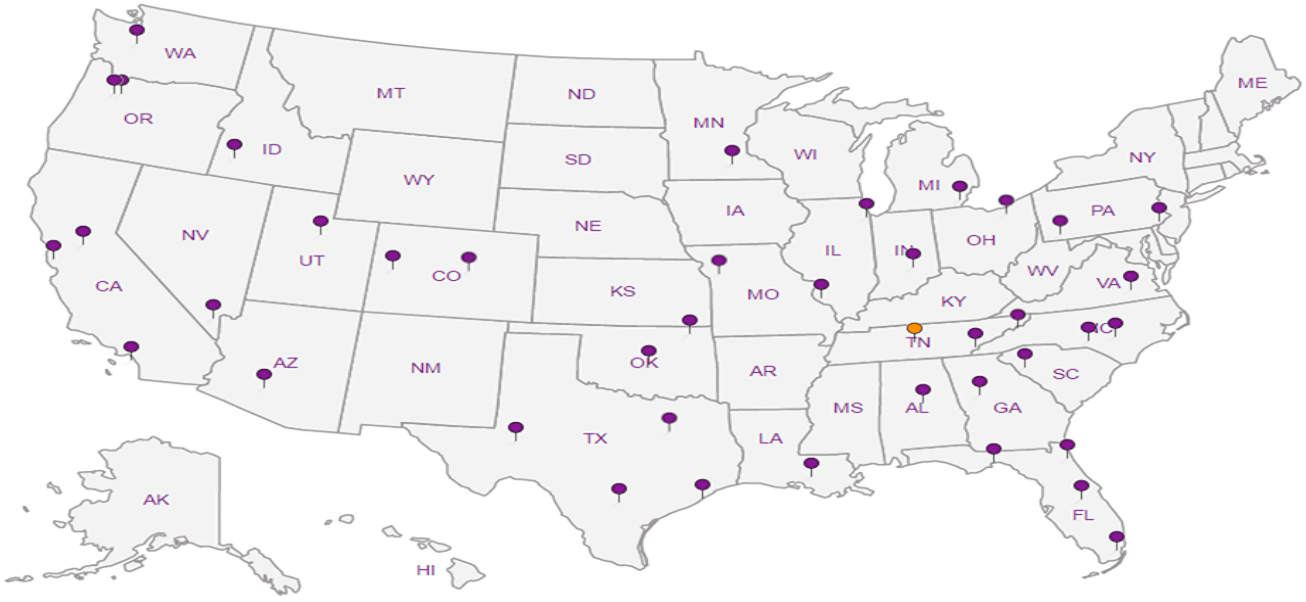
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



AECOM - Kansas City, MO

2380 McGee Suite 200
Kansas City, MO 64108

Billing Information:
Dana Monroe - 1334927
2380 McGee Suite 200
Kansas City, MO 64108

Report to: Alla Skaskevych

Email To: alla.skaskevych@aecom.com; robert.exceen@aecom.com; jay.martin@kcpl.com

Project Description: La Cygne Generating Station

City/State Collected:

Phone: 913-344-1000
Fax: 913-344-1011

Client Project # 60482842

Lab Project # URSKC-LACYGNE

Collected by (print): Terry Andrews

Site/Facility ID # TASK 100

P.O. # PROCESS AS NON-PO

Collected by (signature):

Immediately Packed on Ice N ___ Y ___

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
✓ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 962121

H249

Acctnum: URSKC
Template: T130678
Prelogin: P634396
TSR: 206 - Jeff Carr
PB:

Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Calcium - 6020 250mlHDPE-HNO3	SULFATE 125mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-902	Grab	GW	—	1/9/18	11:50	1		X		-01
MW-805	"	GW	—	"	12:45	1	X			-02

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier XSWA

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	1/9/18	13:30	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 0.9 °C Bottles Received: 2

Date: 1-10-18 Time: 0915

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Jared Morrison
December 16, 2022

ATTACHMENT 1-2

May 2018 Sampling Event Laboratory Report

ANALYTICAL REPORT

June 04, 2018

SCS Engineers - KS

Sample Delivery Group:	L996942
Samples Received:	05/25/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To: Jason Franks
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Entire Report Reviewed By:

Jeff Carr
Technical Service Representative

TABLE OF CONTENTS

MW-901 L996942-01 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 13:40	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117200	1	05/29/18 13:53	05/29/18 13:53	DR
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 16:48	TRB

MW-902 L996942-02 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 12:40	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117200	1	05/29/18 14:26	05/29/18 14:26	DR
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 16:51	TRB

MW-903 L996942-03 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 10:45	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117200	1	05/29/18 14:43	05/29/18 14:43	DR
Wet Chemistry by Method 9056A	WG1117779	20	05/31/18 05:03	05/31/18 05:03	MAJ
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 16:35	TRB

MW-904 L996942-04 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 09:35	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117779	1	05/31/18 05:18	05/31/18 05:18	MAJ
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 16:55	TRB

MW-905 L996942-05 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 14:45	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117779	1	05/31/18 06:04	05/31/18 06:04	MAJ
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 17:04	TRB

DUPLICATE 1 L996942-06 GW

Collected by	Collected date/time	Received date/time
Bryan Ross	05/23/18 10:50	05/25/18 10:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1117283	1	05/30/18 15:41	05/30/18 16:06	MMF
Wet Chemistry by Method 9056A	WG1117779	1	05/31/18 06:19	05/31/18 06:19	MAJ
Wet Chemistry by Method 9056A	WG1118331	20	05/31/18 18:20	05/31/18 18:20	MAJ
Metals (ICP) by Method 6010B	WG1117056	1	05/30/18 18:08	05/31/18 17:08	TRB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Technical Service Representative

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	520000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	22600		1000	1	05/29/2018 13:53	WG1117200
Fluoride	547		100	1	05/29/2018 13:53	WG1117200
Sulfate	17900		5000	1	05/29/2018 13:53	WG1117200

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1140		200	1	05/31/2018 16:48	WG1117056
Calcium	57100		1000	1	05/31/2018 16:48	WG1117056

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	511000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	33900		1000	1	05/29/2018 14:26	WG1117200
Fluoride	541		100	1	05/29/2018 14:26	WG1117200
Sulfate	32500		5000	1	05/29/2018 14:26	WG1117200

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1220		200	1	05/31/2018 16:51	WG1117056
Calcium	70900		1000	1	05/31/2018 16:51	WG1117056

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	1920000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	25600		1000	1	05/29/2018 14:43	WG1117200
Fluoride	ND		100	1	05/29/2018 14:43	WG1117200
Sulfate	896000		100000	20	05/31/2018 05:03	WG1117779

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	428		200	1	05/31/2018 16:35	WG1117056
Calcium	368000	V	1000	1	05/31/2018 16:35	WG1117056

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	677000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	33800		1000	1	05/31/2018 05:18	WG1117779
Fluoride	444		100	1	05/31/2018 05:18	WG1117779
Sulfate	80700		5000	1	05/31/2018 05:18	WG1117779

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1100		200	1	05/31/2018 16:55	WG1117056
Calcium	72200		1000	1	05/31/2018 16:55	WG1117056

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	602000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	51900		1000	1	05/31/2018 06:04	WG1117779
Fluoride	581		100	1	05/31/2018 06:04	WG1117779
Sulfate	27500		5000	1	05/31/2018 06:04	WG1117779

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1780		200	1	05/31/2018 17:04	WG1117056
Calcium	47800		1000	1	05/31/2018 17:04	WG1117056

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	1980000		10000	1	05/30/2018 16:06	WG1117283

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	25600		1000	1	05/31/2018 06:19	WG1117779
Fluoride	ND		100	1	05/31/2018 06:19	WG1117779
Sulfate	1000000		100000	20	05/31/2018 18:20	WG1118331

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	426		200	1	05/31/2018 17:08	WG1117056
Calcium	370000		1000	1	05/31/2018 17:08	WG1117056

Method Blank (MB)

(MB) R3314627-1 05/30/18 16:06

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L996942-01 Original Sample (OS) • Duplicate (DUP)

(OS) L996942-01 05/30/18 16:06 • (DUP) R3314627-4 05/30/18 16:06

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	520000	522000	1	0.384		5

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3314627-2 05/30/18 16:06 • (LCSD) R3314627-3 05/30/18 16:06

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Dissolved Solids	8800000	8610000	8580000	97.8	97.5	85.0-115			0.349	5

Method Blank (MB)

(MB) R3313649-1 05/29/18 11:50

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Fluoride	18.9	J	9.90	100
Sulfate	U		77.4	5000

L996942-01 Original Sample (OS) • Duplicate (DUP)

(OS) L996942-01 05/29/18 13:53 • (DUP) R3313649-4 05/29/18 14:10

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	22600	22500	1	0.595		15
Fluoride	547	557	1	1.83		15
Sulfate	17900	18000	1	0.432		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3313649-2 05/29/18 12:06 • (LCSD) R3313649-3 05/29/18 12:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40000	40200	40200	101	100	80.0-120			0.193	15
Fluoride	8000	8040	8010	100	100	80.0-120			0.312	15
Sulfate	40000	40500	40500	101	101	80.0-120			0.0148	15

L996942-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L996942-03 05/29/18 14:43 • (MS) R3313649-5 05/29/18 14:59 • (MSD) R3313649-6 05/29/18 15:15

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	25600	74100	75200	97.1	99.2	1	80.0-120			1.44	15
Fluoride	5000	ND	4770	4860	93.6	95.5	1	80.0-120			1.99	15

Method Blank (MB)

(MB) R3314154-1 05/30/18 22:54

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	112	J	51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L996368-01 Original Sample (OS) • Duplicate (DUP)

(OS) L996368-01 05/31/18 01:11 • (DUP) R3314154-4 05/31/18 01:27

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	45600	45900	1	0.742		15
Fluoride	ND	33.3	1	1.51	J	15
Sulfate	28300	28300	1	0.190		15

L996467-05 Original Sample (OS) • Duplicate (DUP)

(OS) L996467-05 05/31/18 03:46 • (DUP) R3314154-7 05/31/18 04:01

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	3220	3360	1	4.23		15
Fluoride	ND	22.7	1	0.000		15
Sulfate	ND	3120	1	0.000		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3314154-2 05/30/18 23:09 • (LCSD) R3314154-3 05/30/18 23:25

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40000	39500	39400	98.7	98.6	80.0-120			0.140	15
Fluoride	8000	7940	7940	99.2	99.3	80.0-120			0.0164	15
Sulfate	40000	39700	39700	99.3	99.1	80.0-120			0.133	15

L996368-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L996368-01 05/31/18 01:11 • (MS) R3314154-5 05/31/18 01:42 • (MSD) R3314154-6 05/31/18 01:58

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	45600	96000	93000	101	94.9	1	80.0-120			3.16	15
Fluoride	5000	ND	5030	5040	100	100	1	80.0-120			0.141	15
Sulfate	50000	28300	75300	76100	93.9	95.5	1	80.0-120			1.08	15

L996467-05 Original Sample (OS) • Matrix Spike (MS)

(OS) L996467-05 05/31/18 03:46 • (MS) R3314154-8 05/31/18 04:16

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	3220	59000	112	1	80.0-120	
Fluoride	5000	ND	5360	107	1	80.0-120	
Sulfate	50000	ND	53700	101	1	80.0-120	

Method Blank (MB)

(MB) R3314570-1 05/31/18 11:45

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Sulfate	U		77.4	5000

L996949-07 Original Sample (OS) • Duplicate (DUP)

(OS) L996949-07 05/31/18 20:11 • (DUP) R3314570-6 05/31/18 20:29

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Sulfate	166000	167000	5	0.316		15

L997865-01 Original Sample (OS) • Duplicate (DUP)

(OS) L997865-01 05/31/18 22:02 • (DUP) R3314570-7 05/31/18 22:58

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Sulfate	59100	59200	1	0.233		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3314570-2 05/31/18 12:03 • (LCSD) R3314570-3 05/31/18 12:22

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Sulfate	40000	39400	37900	98.5	94.8	80.0-120			3.81	15

L997865-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L997865-01 05/31/18 22:02 • (MS) R3314570-8 05/31/18 23:17

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Sulfate	50000	59100	106000	94.5	1	80.0-120	E

Method Blank (MB)

(MB) R3314442-1 05/31/18 16:25

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3314442-2 05/31/18 16:29 • (LCSD) R3314442-3 05/31/18 16:32

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	947	938	94.7	93.8	80.0-120			0.966	20
Calcium	10000	9790	9690	97.9	96.9	80.0-120			1.03	20

L996942-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L996942-03 05/31/18 16:35 • (MS) R3314442-5 05/31/18 16:42 • (MSD) R3314442-6 05/31/18 16:45

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	428	1380	1380	95.2	95.3	1	75.0-125			0.128	20
Calcium	10000	368000	372000	373000	45.8	53.5	1	75.0-125	V	V	0.207	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by ESC Lab Sciences.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

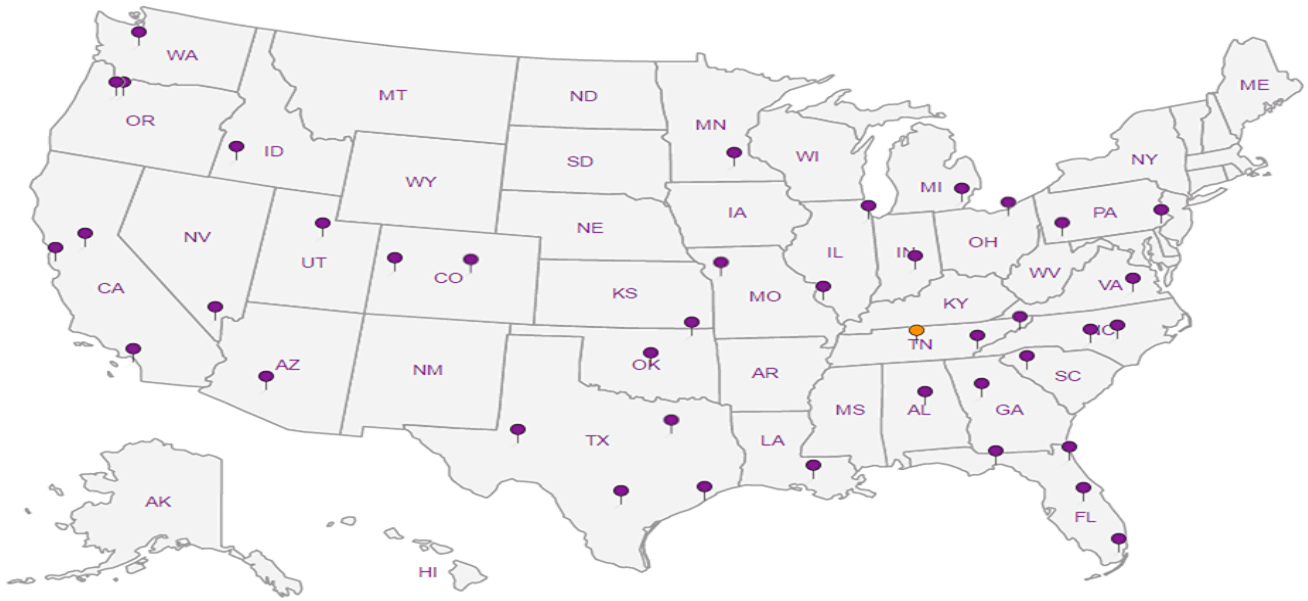
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. ESC Lab Sciences performs all testing at our central laboratory.



SCS Engineers - KS

7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Billing Information:
Accounts Payable
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Pres Chk

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCPL - LaCygne Generating Station

City/State Collected: KS

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27217233.18

Lab Project # AQUAOPKS-LACYGNE

Collected by (print): Bryan Ross

Site/Facility ID #

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed

Immediately Packed on Ice N ___ Y X

Analysis / Container / Preservative

Chain of Custody Page ___ of ___

ESC
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 996942

M221

Acctnum: AQUAOPKS
Template: T136292
Prelogin: P653938
TSR: 206 - Jeff Carr
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-901	Grab	GW		5/23/18	1340	3	X	X	X		01
MW-902		GW		5/23/18	1240	3	X	X	X		02
MW-903		GW		5/23/18	1045	3	X	X	X		03
MW-904		GW		5/23/18	935	3	X	X	X		04
MW-905		GW		5/23/18	1445	3	X	X	X		05
MS 903		GW		5/23/18	1055	3	X	X	X		07
MSD 903		GW		5/23/18	1100	3	X	X	X		08
DUPLICATE 1	↓	GW		5/23/18	1050	3	X	X	X		06

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks: MS/MSD collected from 903

pH _____ Temp _____
Flow _____ Other _____

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Samples returned via: ___ UPS ___ FedEx ___ Courier ___ _____

Tracking #

Trip Blank Received: Yes / No HCL / MeoH TBR

Relinquished by : (Signature) Bryan Ross — Date: 5/24/18 — Time: 1415 — Received by: (Signature)

Relinquished by : (Signature) — Date: — Time: — Received by: (Signature) — Temp: 3.1 °C — Bottles Received: 24 — If preservation required by Login: Date/Time

Relinquished by : (Signature) — Date: — Time: — Received for lab by: (Signature) — Date: 5/25/18 — Time: 1000 — Hold: — Condition: NCF / OK

Jared Morrison
December 16, 2022

ATTACHMENT 1-3

July 2018 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

July 19, 2018

SCS Engineers - KS

Sample Delivery Group:	L1008819
Samples Received:	07/12/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To: Jason Franks
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-11 L1008819-01 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 10:40 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1138084	1	07/16/18 23:15	07/16/18 23:15	MCG
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 17:40	WBD

MW-13 L1008819-02 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 13:05 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1138084	1	07/17/18 00:17	07/17/18 00:17	MCG
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 18:21	WBD

MW-804 L1008819-03 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 12:35 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1138084	1	07/17/18 01:05	07/17/18 01:05	MCG
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 18:24	WBD

DUPLICATE 1 L1008819-04 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 10:40 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1138084	1	07/17/18 01:20	07/17/18 01:20	MCG
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 18:26	WBD

MW-902 L1008819-05 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 11:15 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 18:29	WBD

MW-903 L1008819-06 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 10:25 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 17:51	WBD

DUPLICATE 2 L1008819-07 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 10:20 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1137343	1	07/13/18 09:49	07/14/18 18:37	WBD

MW-704 L1008819-08 GW

Collected by: Gabby Penaflok | Collected date/time: 07/11/18 11:30 | Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1137760	1	07/14/18 01:05	07/14/18 01:05	MAJ

DUPLICATE 3 L1008819-09 GW

Collected by: Gabby Penaflok
Collected date/time: 07/11/18 11:30
Received date/time: 07/12/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1137214	5	07/14/18 21:49	07/14/18 21:49	MCG

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All radiochemical sample results for solids are reported on a dry weight basis with the exception of tritium, carbon-14 and radon, unless wet weight was requested by the client. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	532		100	1	07/16/2018 23:15	WG1138084

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1170		200	1	07/14/2018 17:40	WG1137343

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	181		100	1	07/17/2018 00:17	WG1138084

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	533		200	1	07/14/2018 18:21	WG1137343

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	449		100	1	07/17/2018 01:05	WG1138084

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1670		200	1	07/14/2018 18:24	WG1137343

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Fluoride	530		100	1	07/17/2018 01:20	WG1138084

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1170		200	1	07/14/2018 18:26	WG1137343

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	69100		1000	1	07/14/2018 18:29	WG1137343

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	371000	V	1000	1	07/14/2018 17:51	WG1137343

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	373000		1000	1	07/14/2018 18:37	WG1137343

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	87100		1000	1	07/14/2018 01:05	WG1137760

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	82800		5000	5	07/14/2018 21:49	WG1137214

Method Blank (MB)

(MB) R3325628-1 07/14/18 12:48

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000

L1008561-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1008561-01 07/14/18 17:42 • (DUP) R3325628-4 07/14/18 17:57

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	8250	8260	1	0.176		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3325628-2 07/14/18 13:03 • (LCSD) R3325628-3 07/14/18 13:18

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40000	38100	38100	95.1	95.2	80.0-120			0.0993	15

L1008561-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1008561-01 07/14/18 17:42 • (MS) R3325628-5 07/14/18 18:13

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	8250	57900	99.3	1	80.0-120	

Method Blank (MB)

(MB) R3325510-1 07/13/18 20:40

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000

L1008471-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1008471-01 07/13/18 23:00 • (DUP) R3325510-4 07/13/18 23:42

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	4400	4400	1	0.116		15

L1008819-08 Original Sample (OS) • Duplicate (DUP)

(OS) L1008819-08 07/14/18 01:05 • (DUP) R3325510-6 07/14/18 01:19

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	87100	87000	1	0.148		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3325510-2 07/13/18 20:54 • (LCSD) R3325510-3 07/13/18 21:08

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40000	39100	39100	97.8	97.8	80.0-120			0.00256	15

L1008471-01 Original Sample (OS) • Matrix Spike (MS)

(OS) L1008471-01 07/13/18 23:00 • (MS) R3325510-5 07/13/18 23:56

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	4400	55800	103	1	80.0-120	

L1008819-08 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1008819-08 07/14/18 01:05 • (MS) R3325510-7 07/14/18 01:33 • (MSD) R3325510-8 07/14/18 01:47

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	87100	134000	134000	92.9	93.4	1	80.0-120	E	E	0.202	15

Method Blank (MB)

(MB) R3326123-1 07/16/18 16:38

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Fluoride	U		9.90	100

L1008819-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1008819-01 07/16/18 23:15 • (DUP) R3326123-4 07/16/18 23:30

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Fluoride	532	600	1	11.9		15

L1009414-07 Original Sample (OS) • Duplicate (DUP)

(OS) L1009414-07 07/17/18 04:40 • (DUP) R3326123-7 07/17/18 04:55

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Fluoride	ND	0.000	1	0.000		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3326123-2 07/16/18 16:53 • (LCSD) R3326123-3 07/16/18 17:09

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Fluoride	8000	8180	8170	102	102	80.0-120			0.0807	15

L1008819-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1008819-01 07/16/18 23:15 • (MS) R3326123-5 07/16/18 23:46 • (MSD) R3326123-6 07/17/18 00:01

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Fluoride	5000	532	5450	5610	98.4	101	1	80.0-120			2.77	15

L1009414-07 Original Sample (OS) • Matrix Spike (MS)

(OS) L1009414-07 07/17/18 04:40 • (MS) R3326123-8 07/17/18 05:11

Analyte	Spike Amount	Original Result	MS Result	MS Rec.	Dilution	Rec. Limits	MS Qualifier
	ug/l	ug/l	ug/l	%		%	
Fluoride	5000	ND	5110	102	1	80.0-120	

Method Blank (MB)

(MB) R3325573-1 07/14/18 17:32

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3325573-2 07/14/18 17:35 • (LCSD) R3325573-3 07/14/18 17:38

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	971	969	97.1	96.9	80.0-120			0.228	20
Calcium	10000	10000	10000	100	100	80.0-120			0.195	20

L1008819-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1008819-01 07/14/18 17:40 • (MS) R3325573-5 07/14/18 17:46 • (MSD) R3325573-6 07/14/18 17:48

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	1170	2110	2110	93.9	94.3	1	75.0-125			0.164	20
Calcium	10000	56200	65600	65800	94.1	96.6	1	75.0-125			0.378	20

L1008819-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1008819-06 07/14/18 17:51 • (MS) R3325573-7 07/14/18 17:54 • (MSD) R3325573-8 07/14/18 17:56

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	489	1480	1460	98.9	97.5	1	75.0-125			0.974	20
Calcium	10000	371000	376000	377000	53.6	63.5	1	75.0-125	V	V	0.262	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

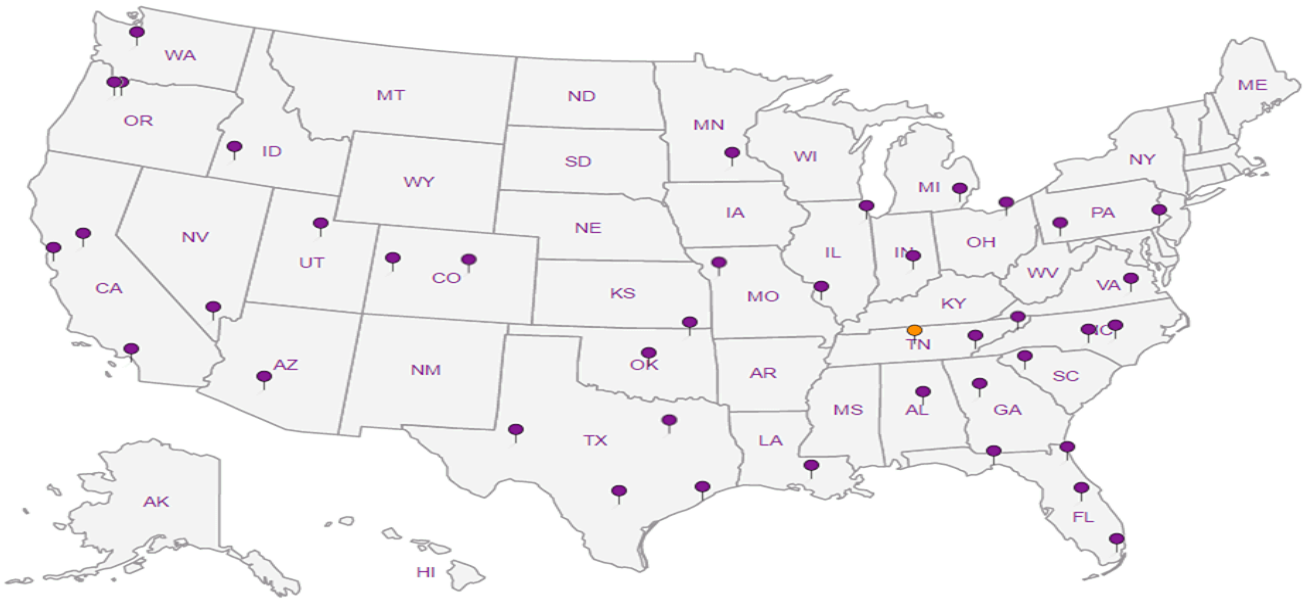
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Billing Information:
Accounts Payable
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Pres Chk

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCPL - LaCygne Generating Station

City/State Collected: LA CYGNE, KS

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27217233.18

Lab Project # AQUAOPKS-LACYGNE

Collected by (print): Gabby Penaflor

Site/Facility ID #

P.O. #

Collected by (signature): Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STD

Chain of Custody Page 1 of 2

ESC
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1008819
A003

Acctnum: AQUAOPKS
Template: T136292
Prelogin: P659524
TSR: 206 - Jeff Carr
PB:
Shipped Via:

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride 125mlHDPE-NoPres	Fluoride 125mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-11	GRAB	GW		7/11/18	1040	2	X			X		-01
MW-13		GW			1305	2	X			X		-02
MW-804		GW			1235	2	X			X		-03
DUPLICATE 1		GW			1040	2	X			X		-04
MS/MSD		GW			1040	2	X			X		
MW-902		GW			1115	1		X				-05
MW-903		GW			1025	1		X				-06
DUPLICATE 2		GW			1020	1		X				-07
MS/MSD		GW			1020	1		X				
MW-704		GW			1130	1			X			-08

Analysis / Container / Preservative

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

pH ____ Temp ____
Flow ____ Other ____

Samples returned via:
__ UPS __ FedEx __ Courier __ ____

Tracking # 4361 6933 8720

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Gabby Penaflor	7-11-18	1502	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)

Trip Blank Received: Yes (No) HCL / MeoH TBR

Temp: 3.4/3.9 °C Bottles Received: 17

Date: 7/12/18 Time: 8:45

If preservation required by Login: Date/Time

Hold:

Condition: NCF / OK

SCS Engineers - KS

7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Billing Information:
Accounts Payable
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCPL - LaCygne Generating Station

City/State Collected: LA CYGNE, KS

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27217233.18

Lab Project # AQUAOPKS-LACYGNE

Collected by (print): Gabby Penaflor

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: SID

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride 125mlHDPE-NoPres	Fluoride 125mlHDPE-NoPres	Remarks	Sample # (lab only)
DUPLICATE 3	GRAB	GW		7/11/18	1130	1			X			-09
MS/MSD	GRAB	GW		7/11/18	1130	1			X			

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Samples returned via:
__ UPS __ FedEx __ Courier __ _____

Tracking # 4361 6933 8720

Trip Blank Received: Yes / (No) HCL / MeoH TBR

Temp: 3.4°C Bottles Received: 17

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
	7-11-18	1502	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)
	7/12/18	8:45	

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N

Chain of Custody Page 2 of 2

ESC
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# 1008810

Table #

Acctnum: AQUAOPKS

Template: T136292

Prelogin: P659524

TSR: 206 - Jeff Carr

PB:

Shipped Via:

Jared Morrison
December 16, 2022

ATTACHMENT 1-4

August 2018 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

August 27, 2018

SCS Engineers - KS

Sample Delivery Group:	L1019102
Samples Received:	08/18/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To: Jason Franks
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Entire Report Reviewed By:

Jeff Carr
Project Manager

TABLE OF CONTENTS

MW-13 L1019102-01 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 10:50 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1155538	1	08/23/18 12:53	08/24/18 00:34	TRB

MW-804 L1019102-02 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 12:22 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1155538	1	08/23/18 12:53	08/23/18 23:34	TRB

DUPLICATE 1 L1019102-03 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 12:27 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1155538	1	08/23/18 12:53	08/24/18 00:37	TRB

MW-704 L1019102-04 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 13:26 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1154936	1	08/21/18 01:40	08/21/18 01:40	ELN

DUPLICATE 2 L1019102-05 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 13:31 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Wet Chemistry by Method 9056A	WG1154936	5	08/21/18 02:58	08/21/18 02:58	ELN

MW-903 L1019102-06 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 14:03 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1155538	1	08/23/18 12:53	08/23/18 23:44	TRB

DUPLICATE 3 L1019102-07 GW

Collected by: Gabby Penaflor | Collected date/time: 08/16/18 14:08 | Received date/time: 08/18/18 08:45

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010B	WG1155538	1	08/23/18 12:53	08/24/18 00:39	TRB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	513		200	1	08/24/2018 00:34	WG1155538

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1760		200	1	08/23/2018 23:34	WG1155538

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1770		200	1	08/24/2018 00:37	WG1155538

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	83300		1000	1	08/21/2018 01:40	WG1154936

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	83200		5000	5	08/21/2018 02:58	WG1154936

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	382000	V	1000	1	08/23/2018 23:44	WG1155538

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Calcium	381000		1000	1	08/24/2018 00:39	WG1155538

Method Blank (MB)

(MB) R3335357-1 08/20/18 19:52

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	128	J	51.9	1000

L1019087-09 Original Sample (OS) • Duplicate (DUP)

(OS) L1019087-09 08/20/18 23:06 • (DUP) R3335357-4 08/20/18 23:22

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	1680	1630	1	2.96		15

L1019138-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1019138-01 08/21/18 05:16 • (DUP) R3335357-7 08/21/18 05:32

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	42900	43000	1	0.284		15

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3335357-2 08/20/18 20:07 • (LCSD) R3335357-3 08/20/18 20:22

Analyte	Spike Amount ug/l	LCS Result ug/l	LCSD Result ug/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Chloride	40000	38300	38300	95.7	95.7	80.0-120			0.0136	15

L1019102-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1019102-04 08/21/18 01:40 • (MS) R3335357-5 08/21/18 01:56 • (MSD) R3335357-6 08/21/18 02:11

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	83300	129000	129000	91.2	91.5	1	80.0-120	E	E	0.118	15

L1019136-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1019136-01 08/21/18 06:18 • (MS) R3335357-8 08/21/18 06:34 • (MSD) R3335357-9 08/21/18 06:49

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	46300	92000	93000	91.4	93.4	1	80.0-120			1.10	15

Method Blank (MB)

(MB) R3336323-1 08/23/18 23:26

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3336323-2 08/23/18 23:28 • (LCSD) R3336323-3 08/23/18 23:31

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	991	963	99.1	96.3	80.0-120			2.87	20
Calcium	10000	10200	10100	102	101	80.0-120			0.623	20

L1019102-02 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1019102-02 08/23/18 23:34 • (MS) R3336323-5 08/23/18 23:39 • (MSD) R3336323-6 08/23/18 23:42

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	1760	2700	2730	93.5	97.0	1	75.0-125			1.27	20
Calcium	10000	68600	78500	78200	98.9	95.3	1	75.0-125			0.461	20

L1019102-06 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1019102-06 08/23/18 23:44 • (MS) R3336323-7 08/23/18 23:47 • (MSD) R3336323-8 08/23/18 23:49

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	469	1480	1490	101	102	1	75.0-125			0.802	20
Calcium	10000	382000	386000	384000	31.2	15.3	1	75.0-125	V	V	0.414	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

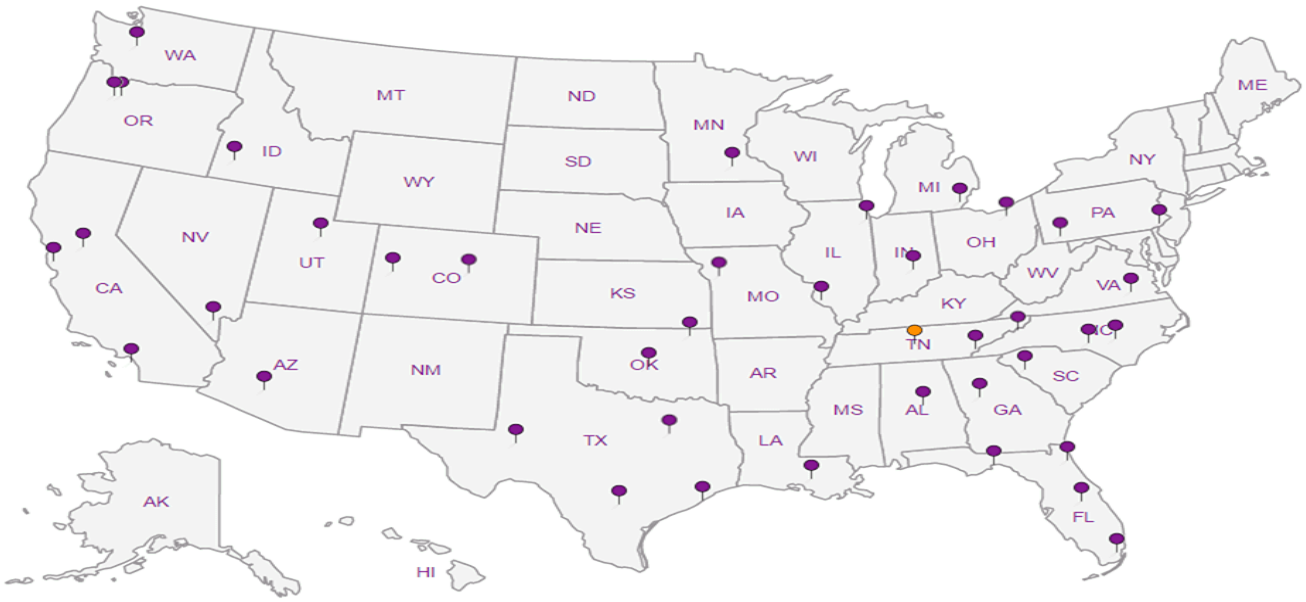
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Billing Information:
Accounts Payable
7311 West 130th Street, Ste. 100
Overland Park, KS 66213

Report to: **Jason Franks**

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: **KCPL - LaCygne Generating Station**

City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # **27217233.18**

Lab Project # **AQUAOPKS-LACYGNE**

Collected by (initials):

Site/Facility ID #

P.O. #

Collected by (signature): Gabby Penaflor
Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: Standard

Pres Chk

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No of Cntrs	Boron - 6010 250mlHDPE-HNO3	Calcium - 6010 250mlHDPE-HNO3	Chloride 125mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-13	GRAB	GW		8/16/18	1050	1	X				01
MW-804		GW			1222	1	X				02
DUPLICATE 1		GW			1227	1	X				03
MS/MSD		GW			1232	1	X				02
MW-704		GW			1326	1			X		04
DUPLICATE 2		GW			1331	1			X		05
MS/MSD		GW			1336	1			X		04
MW-903		GW			1403	1		X			06
DUPLICATE 3		GW			1408	1		X			07
MS/MSD		GW			1413	1		X			06

Chain of Custody Page ___ of ___

Accutest
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # 101902
C052
T

Acctnum: **AQUAOPKS**
Template: **T136292**
Prelogin: **P667527**
TSR: **206 - Jeff Carr**
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other_____

Remarks:

pH _____ Temp _____
Flow _____ Other _____

Samples returned via:
__ UPS V FedEx __ Courier __ _____

Tracking # 4361 6937 7856

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
4.5 NaOH/HR

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Trip Blank Received: Yes / No HCl / MeoH TBR
Gabby Penaflor	8/17/18	1327	Monkelown 8-17-18 1330	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Temp: 0.6 °C Bottles Received: 10
				If preservation required by Login: Date/Time
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 8/18/18 Time: 0745
				Hold:

Condition: NCF / OK

Jared Morrison
December 16, 2022

ATTACHMENT 1-5

November 2018 Sampling Event Laboratory Report

Pace Analytical®
National Center for Testing & Innovation

ANALYTICAL REPORT

December 07, 2018

SCS Engineers - KS

Sample Delivery Group:	L1049235
Samples Received:	12/04/2018
Project Number:	27217233.18
Description:	KCPL - LaCygne Generating Station

Report To: Jason Franks
8575 West 110th Street
Suite 100
Overland Park, KS 66210

Entire Report Reviewed By:

Jeff Carr
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace National is performed per guidance provided in laboratory standard operating procedures: 060302, 060303, and 060304.

TABLE OF CONTENTS

MW-901 L1049235-01 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 13:35 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 05:18	12/06/18 05:18	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 09:04	TRB

MW-902 L1049235-02 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 12:55 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 05:33	12/06/18 05:33	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 09:11	TRB

MW-903 L1049235-03 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 11:55 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 10:17	12/06/18 10:17	ELN
Wet Chemistry by Method 9056A	WG1205005	20	12/06/18 10:32	12/06/18 10:32	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 08:48	TRB

MW-904 L1049235-04 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 11:15 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 06:51	12/06/18 06:51	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 09:14	TRB

MW-905 L1049235-05 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 14:16 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 07:06	12/06/18 07:06	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 09:17	TRB

DUPLICATE 1 L1049235-06 GW

Collected by: G. Penaflor | Collected date/time: 11/29/18 12:00 | Received date/time: 12/04/18 08:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Gravimetric Analysis by Method 2540 C-2011	WG1205180	1	12/05/18 15:27	12/05/18 15:57	AEC
Wet Chemistry by Method 9056A	WG1205005	1	12/06/18 07:21	12/06/18 07:21	ELN
Wet Chemistry by Method 9056A	WG1205005	20	12/06/18 11:03	12/06/18 11:03	ELN
Metals (ICP) by Method 6010B	WG1205321	1	12/04/18 22:53	12/05/18 09:19	TRB

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jeff Carr
Project Manager

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	487000	J3	10000	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	23000		1000	1	12/06/2018 05:18	WG1205005
Fluoride	517		100	1	12/06/2018 05:18	WG1205005
Sulfate	19700		5000	1	12/06/2018 05:18	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1160		200	1	12/05/2018 09:04	WG1205321
Calcium	56400		1000	1	12/05/2018 09:04	WG1205321

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	796000		10000	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	32100		1000	1	12/06/2018 05:33	WG1205005
Fluoride	488		100	1	12/06/2018 05:33	WG1205005
Sulfate	28600		5000	1	12/06/2018 05:33	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1250		200	1	12/05/2018 09:11	WG1205321
Calcium	70400		1000	1	12/05/2018 09:11	WG1205321

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	1230000		25000	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	24700		1000	1	12/06/2018 10:17	WG1205005
Fluoride	104	J3	100	1	12/06/2018 10:17	WG1205005
Sulfate	1120000		100000	20	12/06/2018 10:32	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	493		200	1	12/05/2018 08:48	WG1205321
Calcium	375000	V	1000	1	12/05/2018 08:48	WG1205321

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	604000		13300	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	33500		1000	1	12/06/2018 06:51	WG1205005
Fluoride	406		100	1	12/06/2018 06:51	WG1205005
Sulfate	81500		5000	1	12/06/2018 06:51	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1110		200	1	12/05/2018 09:14	WG1205321
Calcium	72100		1000	1	12/05/2018 09:14	WG1205321

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	619000		13300	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	52400		1000	1	12/06/2018 07:06	WG1205005
Fluoride	520		100	1	12/06/2018 07:06	WG1205005
Sulfate	29000		5000	1	12/06/2018 07:06	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	1890		200	1	12/05/2018 09:17	WG1205321
Calcium	46900		1000	1	12/05/2018 09:17	WG1205321

Gravimetric Analysis by Method 2540 C-2011

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Dissolved Solids	1940000		25000	1	12/05/2018 15:57	WG1205180

Wet Chemistry by Method 9056A

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Chloride	25000		1000	1	12/06/2018 07:21	WG1205005
Fluoride	ND		100	1	12/06/2018 07:21	WG1205005
Sulfate	1110000		100000	20	12/06/2018 11:03	WG1205005

Metals (ICP) by Method 6010B

Analyte	Result	Qualifier	RDL	Dilution	Analysis	Batch
	ug/l		ug/l		date / time	
Boron	524		200	1	12/05/2018 09:19	WG1205321
Calcium	374000		1000	1	12/05/2018 09:19	WG1205321

Method Blank (MB)

(MB) R3366005-1 12/05/18 15:57

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Dissolved Solids	U		2820	10000

L1049235-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1049235-01 12/05/18 15:57 • (DUP) R3366005-3 12/05/18 15:57

Analyte	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
	ug/l	ug/l		%		%
Dissolved Solids	487000	452000	1	7.45	J3	5

Laboratory Control Sample (LCS)

(LCS) R3366005-2 12/05/18 15:57

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
	ug/l	ug/l	%	%	
Dissolved Solids	8800000	8660000	98.4	85.0-115	

Method Blank (MB)

(MB) R3365803-1 12/05/18 23:08

Analyte	MB Result ug/l	MB Qualifier	MB MDL ug/l	MB RDL ug/l
Chloride	U		51.9	1000
Fluoride	U		9.90	100
Sulfate	U		77.4	5000

L1049122-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1049122-02 12/06/18 01:57 • (DUP) R3365803-3 12/06/18 02:13

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	108000	108000	1	0.539	E	15
Fluoride	ND	63.2	1	60.6	J P1	15
Sulfate	42200	42100	1	0.186		15

L1049235-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1049235-03 12/06/18 10:17 • (DUP) R3365803-5 12/06/18 06:04

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Chloride	24700	25000	1	1.19		15
Fluoride	104	107	1	2.27		15

L1049235-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1049235-03 12/06/18 10:32 • (DUP) R3365803-8 12/06/18 10:47

Analyte	Original Result ug/l	DUP Result ug/l	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Sulfate	1120000	1100000	20	1.60		15

Laboratory Control Sample (LCS)

(LCS) R3365803-2 12/05/18 23:23

Analyte	Spike Amount ug/l	LCS Result ug/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Chloride	40000	39200	98.1	80.0-120	
Fluoride	8000	7940	99.3	80.0-120	
Sulfate	40000	40200	100	80.0-120	

L1049122-02 Original Sample (OS) • Matrix Spike (MS)

(OS) L1049122-02 12/06/18 01:57 • (MS) R3365803-4 12/06/18 02:28

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MS Rec. %	Dilution	Rec. Limits %	MS Qualifier
Chloride	50000	108000	152000	88.8	1	80.0-120	E
Fluoride	5000	ND	4820	95.7	1	80.0-120	
Sulfate	50000	42200	87300	90.3	1	80.0-120	

L1049235-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1049235-03 12/06/18 10:17 • (MS) R3365803-6 12/06/18 06:20 • (MSD) R3365803-7 12/06/18 06:35

Analyte	Spike Amount ug/l	Original Result ug/l	MS Result ug/l	MSD Result ug/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Chloride	50000	24700	73100	74200	96.8	98.9	1	80.0-120			1.46	15
Fluoride	5000	104	4270	5110	83.4	100	1	80.0-120		J3	17.9	15
Sulfate	50000	1030000	1020000	1040000	0.000	31.3	1	80.0-120	E V	E V	2.05	15

Method Blank (MB)

(MB) R3365429-1 12/05/18 08:41

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	ug/l		ug/l	ug/l
Boron	U		12.6	200
Calcium	U		46.3	1000

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3365429-2 12/05/18 08:43 • (LCSD) R3365429-3 12/05/18 08:46

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	%	%	%			%	%
Boron	1000	1020	969	102	96.9	80.0-120			4.91	20
Calcium	10000	10100	9960	101	99.6	80.0-120			1.55	20

L1049235-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1049235-03 12/05/18 08:48 • (MS) R3365429-5 12/05/18 08:53 • (MSD) R3365429-6 12/05/18 08:56

Analyte	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	ug/l	ug/l	ug/l	ug/l	%	%		%			%	%
Boron	1000	493	1500	1500	101	100	1	75.0-125			0.480	20
Calcium	10000	375000	382000	384000	64.3	88.2	1	75.0-125	V		0.624	20

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Abbreviations and Definitions

MDL	Method Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
P1	RPD value not applicable for sample concentrations less than 5 times the reporting limit.
V	The sample concentration is too high to evaluate accurate spike recoveries.

Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.
* Not all certifications held by the laboratory are applicable to the results reported in the attached report.
* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN-03-2002-34
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	n/a
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky [1 6]	90010	South Carolina	84004
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana [1]	LA180010	Texas	T 104704245-17-14
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA

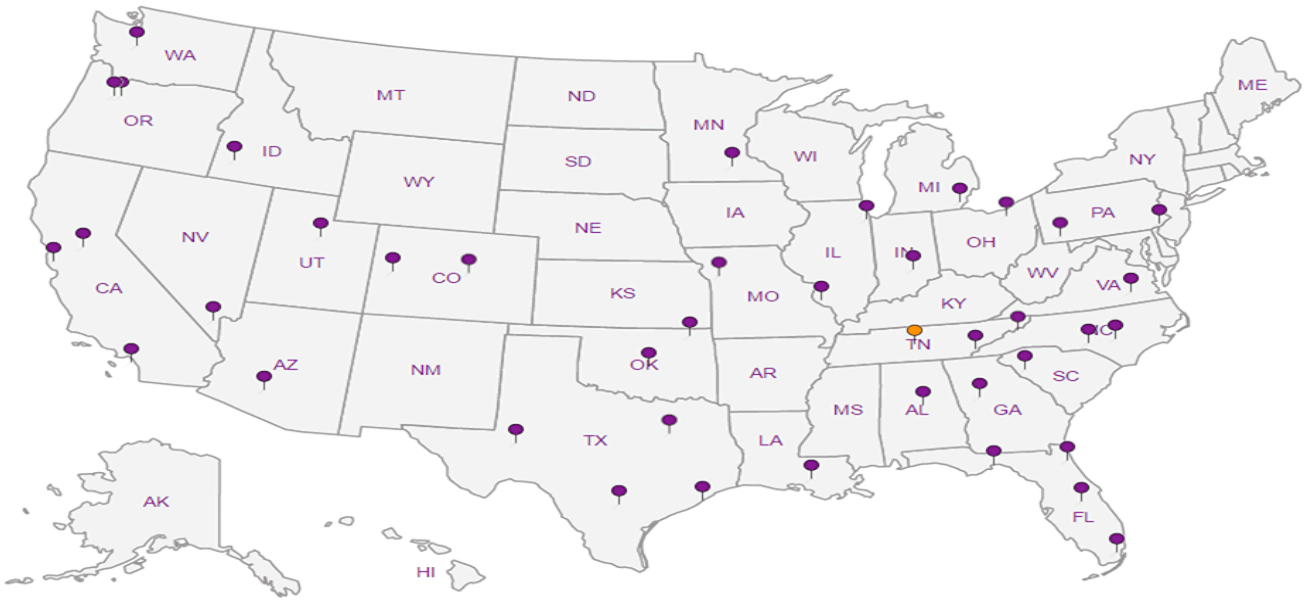
Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.



SCS Engineers - KS
8575 West 110th Street
Suite 100
Overland Park, KS 66210

Billing Information:
Accounts Payable
8575 West 110th Street
Suite 100
Overland Park, KS 66210

Pres Chk

Report to: Jason Franks

Email To: jfranks@scsengineers.com; jay.martin@kcpl.com;

Project Description: KCPL - LaCygne Generating Station

City/State Collected:

Phone: 913-681-0030
Fax: 913-681-0012

Client Project # 27217233.18

Lab Project # AQUAOPKS-LACYGNE

Collected by (print): G. Penaflor

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ___ Y X

Rush? (Lab MUST Be Notified)
___ Same Day ___ Five Day
___ Next Day ___ 5 Day (Rad Only)
___ Two Day ___ 10 Day (Rad Only)
___ Three Day

Quote #

Date Results Needed: STD

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Anions (Cld, F, SO4) 125mlHDPE-NoPres	B, Ca - 6010 250mlHDPE-HNO3	TDS 250mlHDPE-NoPres	Remarks	Sample # (lab only)
MW-901	GRAB	GW		11/29/18	1335	3	X	X	X		-01
MW-902		GW			1255	3	X	X	X		-02
MW-903		GW			1155	3	X	X	X		-03
MW-904		GW			1115	3	X	X	X		-04
MW-905		GW			1416	3	X	X	X		-05
903 MS		GW			1205	3	X	X	X		
903 MSD		GW			1210	3	X	X	X		
DUPLICATE 1		GW			1200	3	X	X	X		-06

Chain of Custody Page ___ of ___

12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L# L1049235
C107

Acctnum: AQUAOPKS
Template: T136276
Prelogin: P679012
TSR: 206 - Jeff Carr
PB:
Shipped Via:

* Matrix:
SS - Soil AIR - Air F - Filter
GW - Groundwater B - Bioassay
WW - WasteWater
DW - Drinking Water
OT - Other

Remarks:

pH ___ Temp ___
Flow ___ Other ___

Samples returned via:
__ UPS __ FedEx __ Courier __ ___

Tracking #

Sample Receipt Checklist
COC Seal Present/Intact: NP Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
If Applicable
VOA Zero Headspace: Y N
Preservation Correct/Checked: Y N
RAD SCREEN: <0.5 mR/hr

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	12/3/18	1342	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Odunk

Trip Blank Received: Yes (No) HCL / MeoH TBR
0

Temp: °C Bottles Received:
0.2 -0.1 -0.1 24

Date: 12/4/18 Time: 8:00

If preservation required by Login: Date/Time

Hold:

Condition: NCF / (OK)

Jared Morrison
December 16, 2022

ATTACHMENT 2

Statistical Analyses

Jared Morrison
December 16, 2022

ATTACHMENT 2-1

Fall 2017 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

January 22, 2018

To: La Cygne Generating Station
25166 East 2200 Road
La Cygne, Kansas 66040
Kansas City Power & Light Company

From: SCS Engineers

RE: Revision to January 15, 2018 Memorandum
Determination of Statistically Significant Increases – Bottom Ash Impoundment

Statistical analysis of monitoring data from the groundwater monitoring system for the Bottom Ash 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. Groundwater samples were collected and analyzed by October 17, 2017. A statistical analysis was conducted to determine whether there is a statistically significant increase over background values for each constituent listed in Appendix III to Part 257-Constituents for Detection Monitoring.

The completed statistical evaluation identified an Appendix III constituent, pH, below its lower prediction limit in monitoring well MW-901. The lower prediction limit for pH in monitoring well MW-901 is 6.95 standard units (S.U.). The detection monitoring sample was reported at 6.77 S.U. The first verification re-sample was collected on January 9, 2018 with a result of 6.84 S.U., which is still below the lower prediction limit. Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for pH from monitoring well MW-901 is below its lower prediction limit and is a confirmed statistically significant decrease below background; unless, a second verification re-sample is collected and is above the lower prediction limit.

Additionally, the completed statistical evaluation identified an Appendix III constituent, sulfate, above its prediction limit in monitoring well MW-902. The prediction limit for sulfate in monitoring well MW-902 is 36 mg/L. The detection monitoring sample was reported at 36.5 mg/L. The first verification re-sample was collected on December 12, 2017 with a result of 36.1 mg/L. The second verification re-sample was collected on January 9, 2018 with a result of 37.9 mg/L. Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for sulfate from monitoring well MW-901 exceeds its prediction limit and is a confirmed statistically significant increase (SSI) over background.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas™ Output:
Statistical evaluation output from Sanitas™ for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when

applicable), extra sample result for quality control (if applicable), and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas™ Configuration Settings:

Screen shots of the applicable Sanitas™ configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

Revision Number	Revision Date	Attachment Revised	Summary of Revisions
1	1/22/2018	Cover letter	Revision table added. No changes to text regarding statistical analyses. Attachment 1 description was revised to match the revisions made in the attachment.
1	1/22/2018	1	Some samples previously identified as verification re-samples are now more appropriately identified as “extra samples”. These samples were taken as part of the quality control process, and were not required as part of verification re-sampling.

La Cygne Generating Station
Determination of Statistically Significant Increases
Bottom Ash Impoundment
January 22, 2018

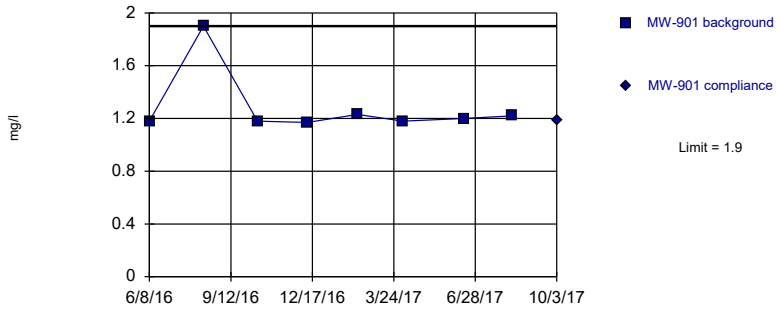
ATTACHMENT 1

Sanitas™ Output

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

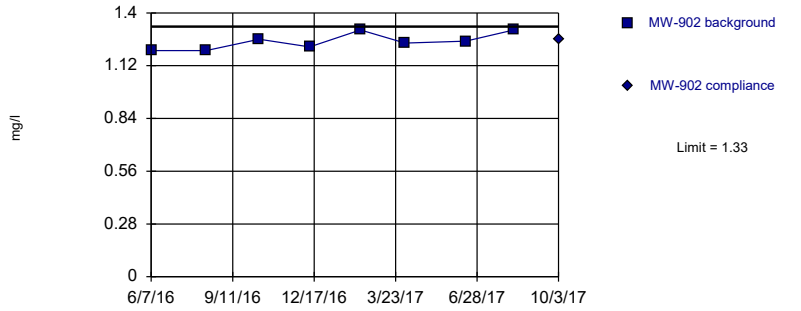
Constituent: BORON Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.5.32 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.25, Std. Dev.=0.0436, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.893, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

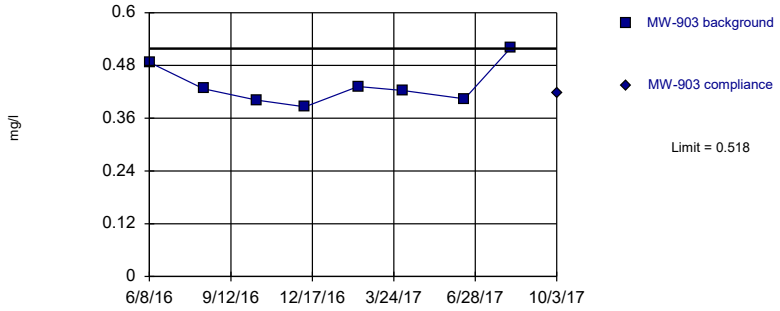
Constituent: BORON Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.5.32 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.435, Std. Dev.=0.046, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.876, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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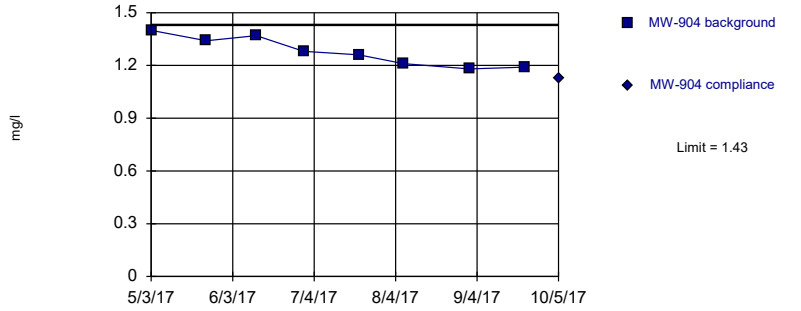
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.28, Std. Dev.=0.0841, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.924, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	1.18	
8/11/2016	1.9	
10/14/2016	1.18	
12/12/2016	1.17	
2/9/2017	1.23	
4/4/2017	1.18	
6/16/2017	1.2	
8/11/2017	1.22	
10/3/2017		1.19

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	1.2	
8/11/2016	1.2	
10/13/2016	1.26	
12/12/2016	1.22	
2/10/2017	1.31	
4/4/2017	1.24	
6/15/2017	1.25	
8/11/2017	1.31	
10/3/2017		1.26

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	0.487	
8/11/2016	0.427	
10/13/2016	0.401	
12/9/2016	0.386	
2/10/2017	0.432	
4/4/2017	0.423	
6/16/2017	0.404	
8/10/2017	0.521	
10/3/2017		0.416

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

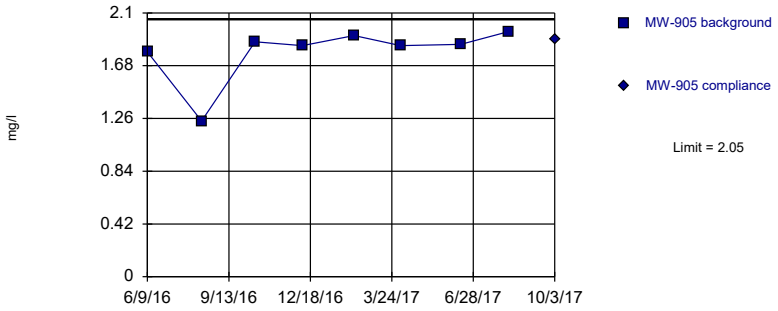
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	1.4	
5/24/2017	1.34	
6/12/2017	1.37	
6/30/2017	1.28	
7/21/2017	1.26	
8/7/2017	1.21	
9/1/2017	1.18	
9/22/2017	1.19	
10/5/2017		1.13

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^4 transformation): Mean=10.9, Std. Dev.=3.71, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.754, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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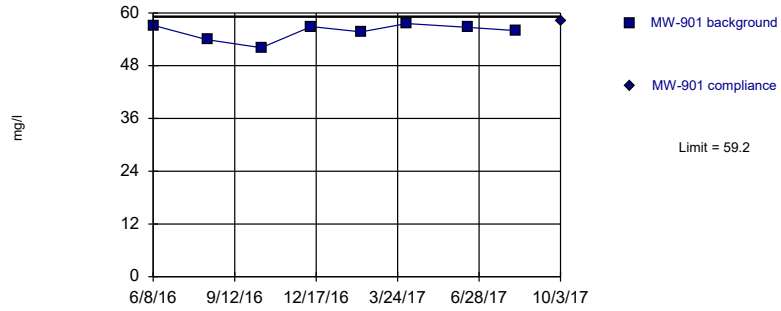
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=55.8, Std. Dev.=1.87, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.87, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

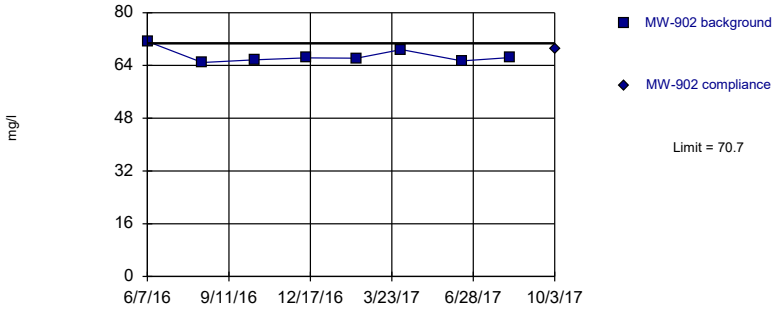
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.5.32 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=66.9, Std. Dev.=2.13, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.812, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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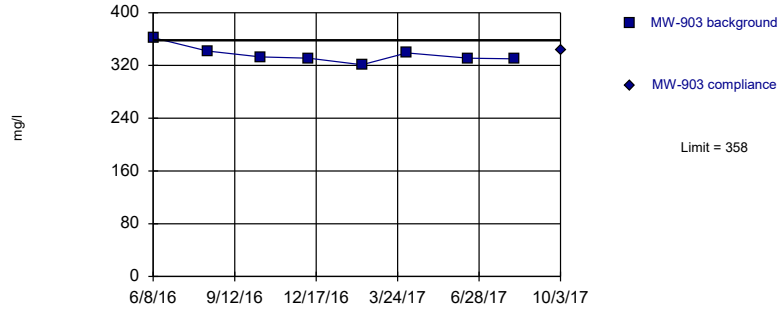
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=336, Std. Dev.=12.2, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.871, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	1.79	
8/12/2016	1.24	
10/14/2016	1.87	
12/9/2016	1.84	
2/8/2017	1.92	
4/4/2017	1.84	
6/14/2017	1.85	
8/9/2017	1.95	
10/3/2017		1.89

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	57.2	
8/11/2016	53.9	
10/14/2016	52.1	
12/12/2016	56.9	
2/9/2017	55.7	
4/4/2017	57.6	
6/16/2017	56.7	
8/11/2017	56	
10/3/2017		58.2

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	71.3	
8/11/2016	64.9	
10/13/2016	65.7	
12/12/2016	66.3	
2/10/2017	66.2	
4/4/2017	68.8	
6/15/2017	65.4	
8/11/2017	66.4	
10/3/2017		69.2

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

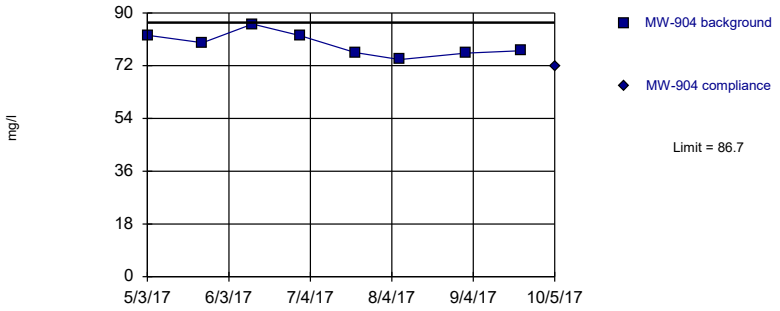
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	362	
8/11/2016	342	
10/13/2016	333	
12/9/2016	331	
2/10/2017	321	
4/4/2017	339	
6/16/2017	331	
8/10/2017	330	
10/3/2017		344

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=79.3, Std. Dev.=4.06, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.942, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

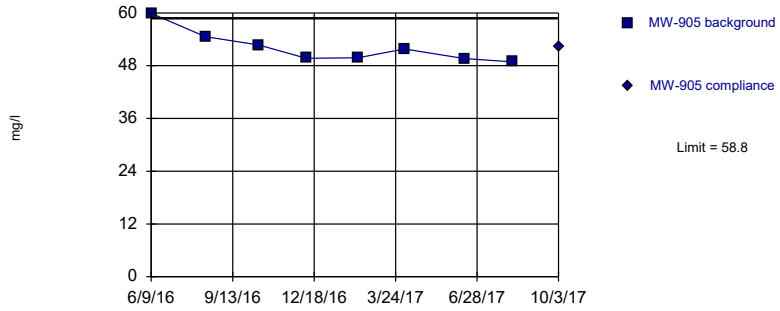
Constituent: CALCIUM Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=52.1, Std. Dev.=3.69, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.828, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

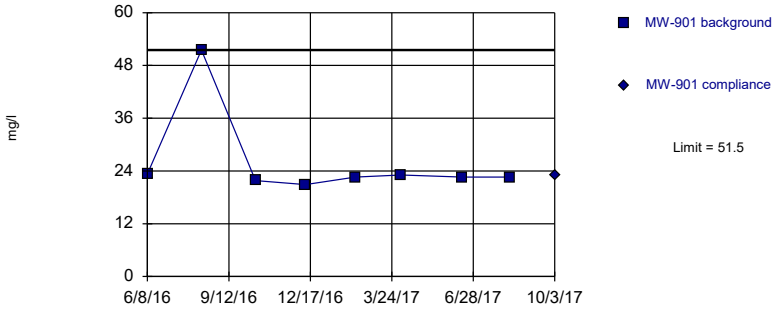
Constituent: CALCIUM Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

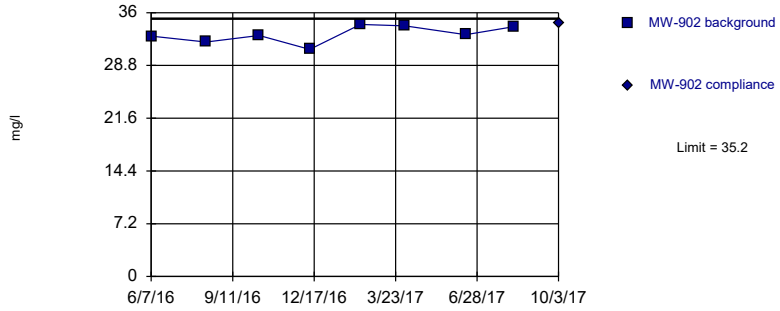
Constituent: CHLORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=33.1, Std. Dev.=1.17, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.925, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	82.4	
5/24/2017	79.8	
6/12/2017	86.2	
6/30/2017	82.3	
7/21/2017	76.5	
8/7/2017	74.1	
9/1/2017	76.3	
9/22/2017	77.1	
10/5/2017		71.8

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	59.9	
8/12/2016	54.6	
10/14/2016	52.7	
12/9/2016	49.7	
2/8/2017	49.8	
4/4/2017	51.8	
6/14/2017	49.6	
8/9/2017	48.9	
10/3/2017		52.3

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	23.3	
8/11/2016	51.5	
10/14/2016	21.8	
12/12/2016	20.9	
2/9/2017	22.6	
4/4/2017	23.1	
6/16/2017	22.6	
8/11/2017	22.6	
10/3/2017		22.9

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

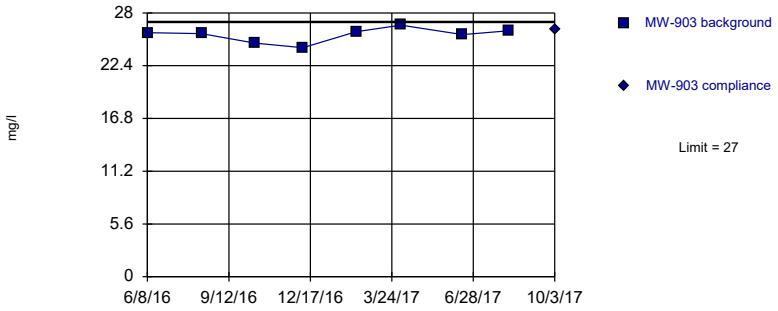
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	32.8	
8/11/2016	32	
10/13/2016	32.9	
12/12/2016	31	
2/10/2017	34.4	
4/4/2017	34.2	
6/15/2017	33	
8/11/2017	34.1	
10/3/2017		34.6

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=25.7, Std. Dev.=0.761, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.91, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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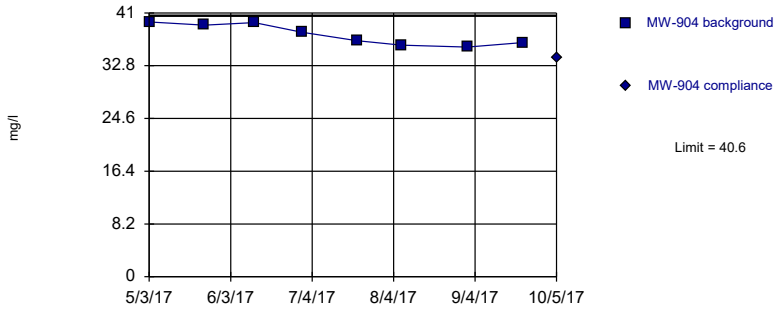
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=37.6, Std. Dev.=1.62, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.873, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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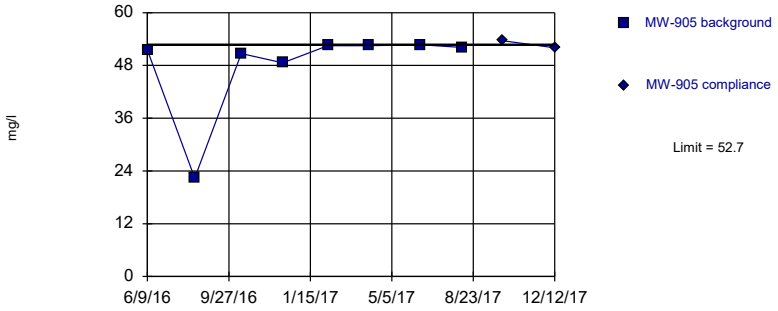
Within Limit

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: CHLORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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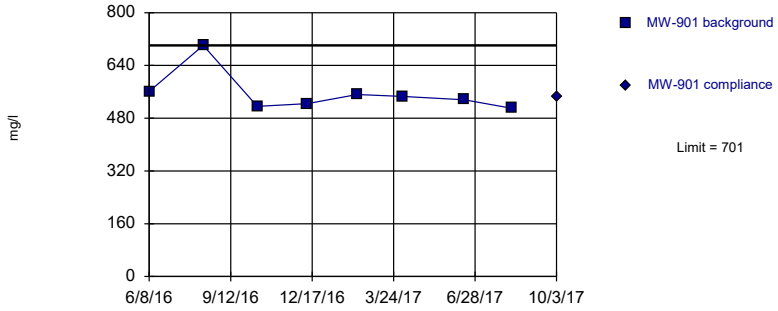
Within Limit

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: DISSOLVED SOLIDS Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	25.9	
8/11/2016	25.8	
10/13/2016	24.8	
12/9/2016	24.3	
2/10/2017	26	
4/4/2017	26.7	
6/16/2017	25.7	
8/10/2017	26.1	
10/3/2017		26.3

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	39.6	
5/24/2017	39.1	
6/12/2017	39.5	
6/30/2017	38	
7/21/2017	36.7	
8/7/2017	36	
9/1/2017	35.7	
9/22/2017	36.4	
10/5/2017		34.1

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905	
6/9/2016	51.5		
8/12/2016	22.4		
10/14/2016	50.7		
12/9/2016	48.6		
2/8/2017	52.5		
4/4/2017	52.5		
6/14/2017	52.7		
8/9/2017	52.1		
10/3/2017		53.6	
12/12/2017		52	1st verification re-sample

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

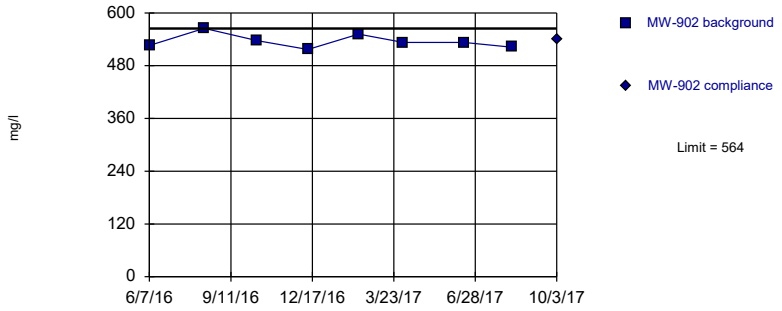
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	561	
8/11/2016	701	
10/14/2016	516	
12/12/2016	524	
2/9/2017	552	
4/4/2017	546	
6/16/2017	536	
8/11/2017	510	
10/3/2017		544

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=536, Std. Dev.=15.9, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.924, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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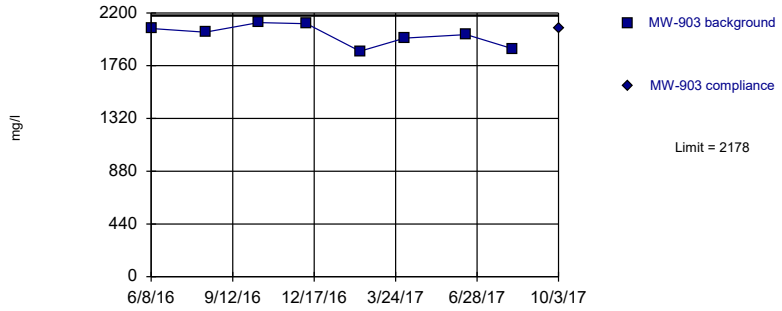
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=2016, Std. Dev.=89.3, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.922, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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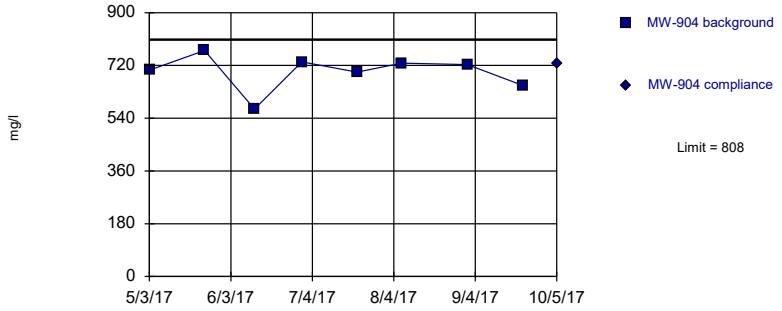
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=697, Std. Dev.=61.3, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.888, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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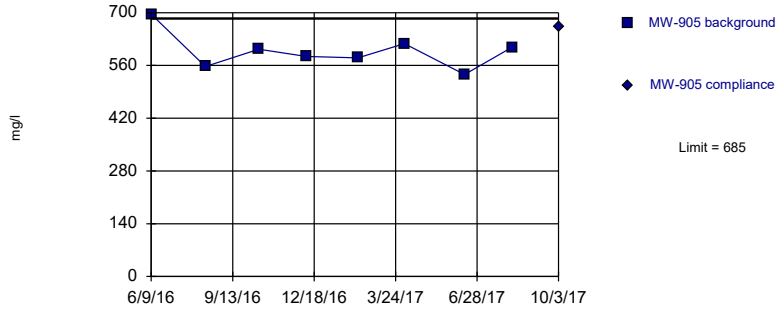
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=598, Std. Dev.=48.1, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.921, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	526	
8/11/2016	565	
10/13/2016	537	
12/12/2016	517	
2/10/2017	552	
4/4/2017	533	
6/15/2017	533	
8/11/2017	522	
10/3/2017		541

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	2070	
8/11/2016	2040	
10/13/2016	2120	
12/9/2016	2110	
2/10/2017	1880	
4/4/2017	1990	
6/16/2017	2020	
8/10/2017	1900	
10/3/2017		2070

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	704	
5/24/2017	771	
6/12/2017	571	
6/30/2017	732	
7/21/2017	697	
8/7/2017	728	
9/1/2017	723	
9/22/2017	652	
10/5/2017		727

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

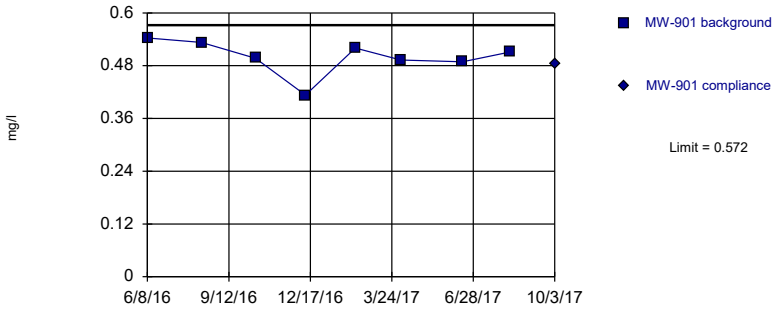
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	696	
8/12/2016	557	
10/14/2016	603	
12/9/2016	584	
2/8/2017	580	
4/4/2017	618	
6/14/2017	536	
8/9/2017	608	
10/3/2017		662

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.5, Std. Dev.=0.04, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.859, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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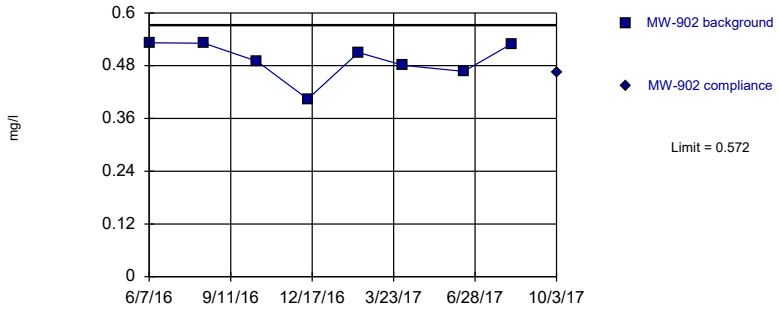
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.493, Std. Dev.=0.0437, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.862, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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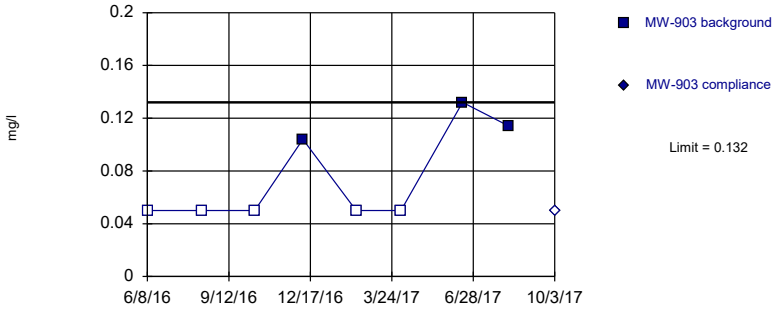
Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: FLUORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

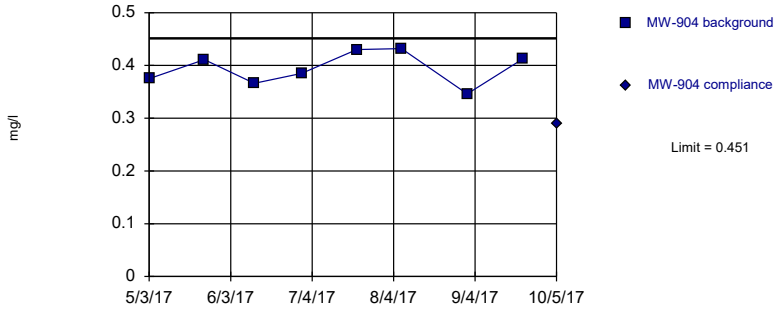
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.5.32 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.395, Std. Dev.=0.0314, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.935, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	0.543	
8/11/2016	0.533	
10/14/2016	0.497	
12/12/2016	0.413	
2/9/2017	0.52	
4/4/2017	0.493	
6/16/2017	0.489	
8/11/2017	0.511	
10/3/2017		0.483

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	0.532	
8/11/2016	0.531	
10/13/2016	0.49	
12/12/2016	0.404	
2/10/2017	0.51	
4/4/2017	0.481	
6/15/2017	0.467	
8/11/2017	0.53	
10/3/2017		0.466

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	<0.1	
8/11/2016	<0.1	
10/13/2016	<0.1	
12/9/2016	0.104	
2/10/2017	<0.1	
4/4/2017	<0.1	
6/16/2017	0.132	
8/10/2017	0.114	
10/3/2017		<0.1

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

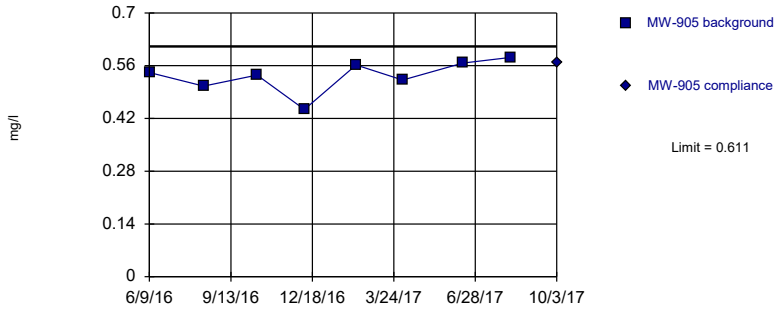
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	0.375	
5/24/2017	0.411	
6/12/2017	0.366	
6/30/2017	0.385	
7/21/2017	0.43	
8/7/2017	0.432	
9/1/2017	0.346	
9/22/2017	0.412	
10/5/2017		0.29

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.533, Std. Dev.=0.0435, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.916, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

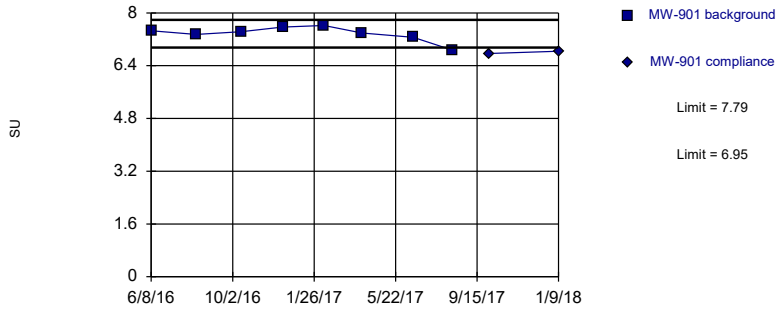
Constituent: FLUORIDE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Exceeds Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.37, Std. Dev.=0.232, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.872, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

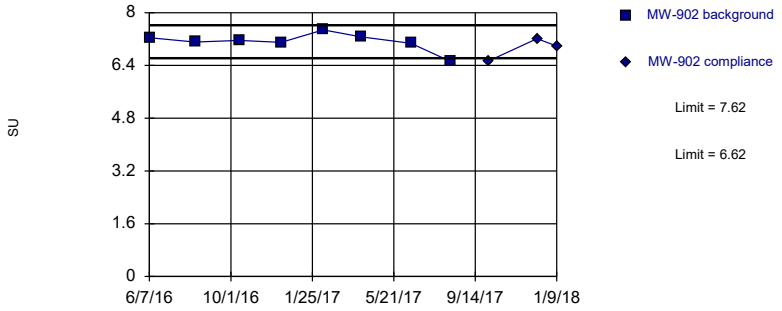
Constituent: pH Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.12, Std. Dev.=0.275, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.849, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

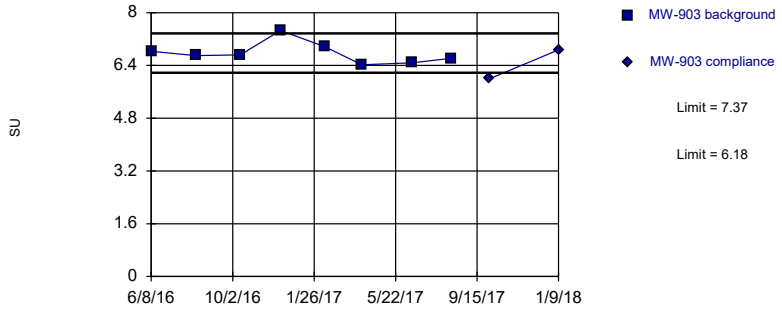
Constituent: pH Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.78, Std. Dev.=0.329, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.894, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: pH Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	0.542	
8/12/2016	0.506	
10/14/2016	0.535	
12/9/2016	0.444	
2/8/2017	0.562	
4/4/2017	0.522	
6/14/2017	0.567	
8/9/2017	0.582	
10/3/2017		0.569

Prediction Limit

Constituent: pH (SU) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901	
6/8/2016	7.46		
8/11/2016	7.35		
10/14/2016	7.43		
12/12/2016	7.57		
2/9/2017	7.62		
4/4/2017	7.39		
6/16/2017	7.26		
8/11/2017	6.87		
10/3/2017		6.77	
1/9/2018		6.84	1st verification re-sample

Prediction Limit

Constituent: pH (SU) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902	
6/7/2016	7.24		
8/11/2016	7.11		
10/13/2016	7.16		
12/12/2016	7.1		
2/10/2017	7.48		
4/4/2017	7.27		
6/15/2017	7.07		
8/11/2017	6.52		
10/3/2017		6.53	
12/12/2017		7.21	1st verification re-sample
1/9/2018		6.99	extra sample

Prediction Limit

Constituent: pH (SU) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

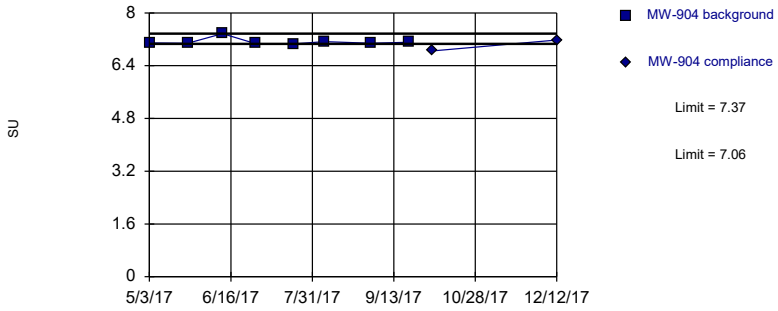
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	6.83	
8/11/2016	6.7	
10/13/2016	6.72	
12/9/2016	7.46	
2/10/2017	6.97	
4/4/2017	6.42	
6/15/2017	6.48	
8/10/2017	6.62	
10/3/2017		6
1/9/2018		6.87 1st verification re-sample

Within Limits

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. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.0236. Individual comparison alpha = 0.0118 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: pH Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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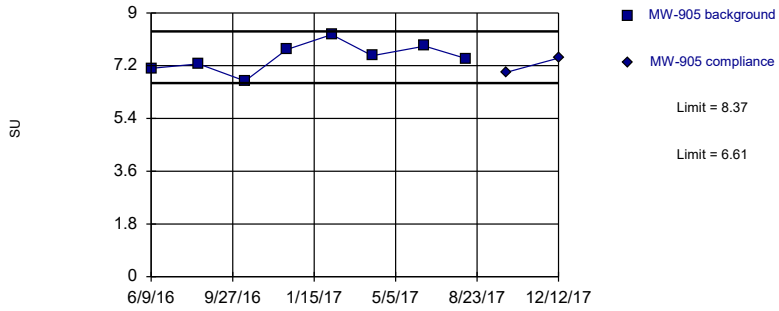
Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.49, Std. Dev.=0.487, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.997, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: pH Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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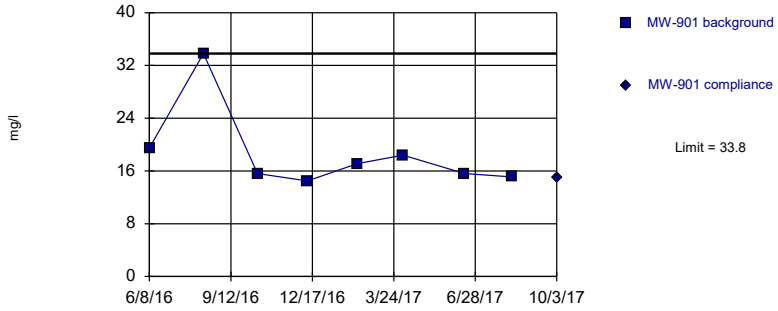
Within Limit

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: SULFATE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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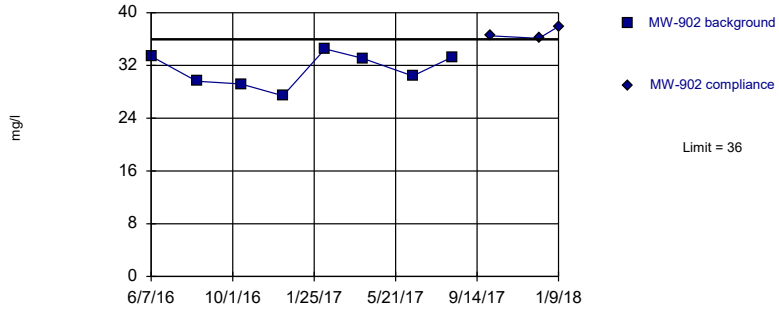
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=31.4, Std. Dev.=2.54, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.913, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: pH (SU) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904	
5/3/2017	7.09		
5/24/2017	7.08		
6/12/2017	7.37		
6/30/2017	7.07		
7/21/2017	7.06		
8/7/2017	7.13		
9/1/2017	7.08		
9/22/2017	7.11		
10/5/2017		6.85	
12/12/2017		7.18	1st verification re-sample

Prediction Limit

Constituent: pH (SU) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	7.11	
8/12/2016	7.26	
10/14/2016	6.68	
12/9/2016	7.75	
2/8/2017	8.26	
4/4/2017	7.54	
6/14/2017	7.87	
8/9/2017	7.44	
10/3/2017		6.98
12/12/2017		7.46 extra sample

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	19.5	
8/11/2016	33.8	
10/14/2016	15.6	
12/12/2016	14.5	
2/9/2017	17.1	
4/4/2017	18.4	
6/16/2017	15.6	
8/11/2017	15.1	
10/3/2017		14.9

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

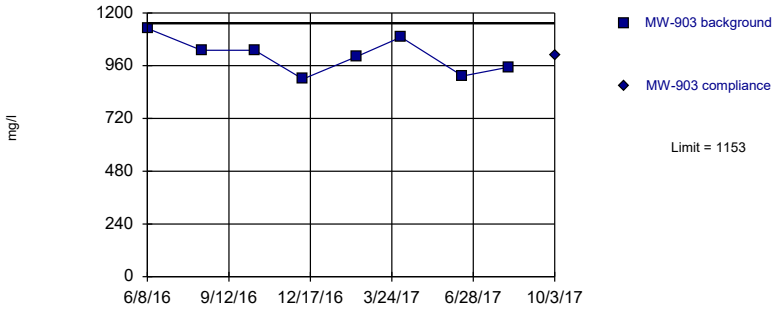
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902	
6/7/2016	33.4		
8/11/2016	29.6		
10/13/2016	29.2		
12/12/2016	27.4		
2/10/2017	34.5		
4/4/2017	33.1		
6/15/2017	30.4		
8/11/2017	33.3		
10/3/2017		36.5	
12/12/2017		36.1	1st verification re-sample
1/9/2018		37.9	2nd verification re-sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1006, Std. Dev.=81.4, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.957, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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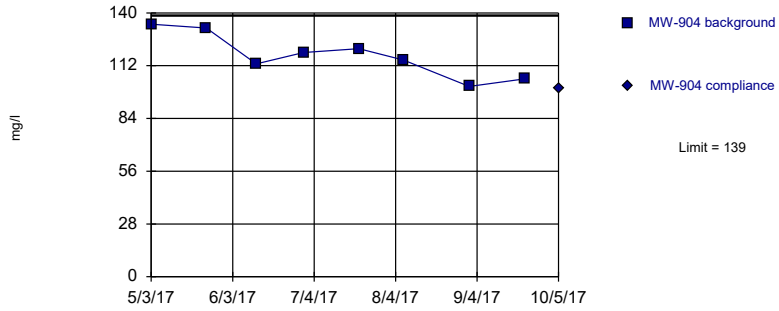
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=118, Std. Dev.=11.7, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.954, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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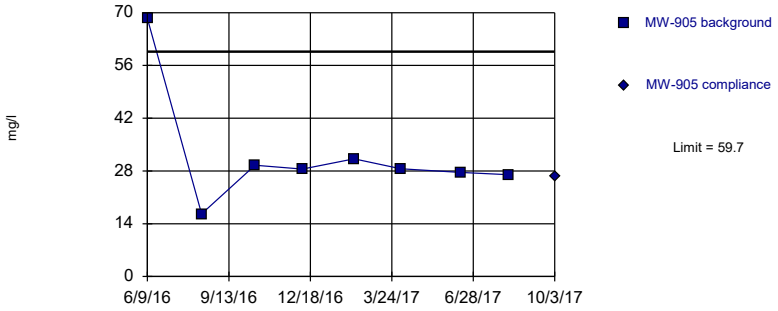
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on cube root transformation): Mean=3.13, Std. Dev.=0.431, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.755, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 1/14/2018 7:07 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	1130	
8/11/2016	1030	
10/13/2016	1030	
12/9/2016	899	
2/10/2017	1000	
4/4/2017	1090	
6/16/2017	913	
8/10/2017	954	
10/3/2017		1010

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	134	
5/24/2017	132	
6/12/2017	113	
6/30/2017	119	
7/21/2017	121	
8/7/2017	115	
9/1/2017	101	
9/22/2017	105	
10/5/2017		100

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 1/14/2018 7:18 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	68.5	
8/12/2016	16.6	
10/14/2016	29.5	
12/9/2016	28.5	
2/8/2017	31.2	
4/4/2017	28.6	
6/14/2017	27.6	
8/9/2017	27	
10/3/2017		26.6

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 1/14/2018, 7:18 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
BORON (mg/l)	MW-901	1.9	n/a	10/3/2017	1.19	No	8	0	n/a	0.00591	NP Intra (normality) ...
BORON (mg/l)	MW-902	1.33	n/a	10/3/2017	1.26	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-903	0.518	n/a	10/3/2017	0.416	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-904	1.43	n/a	10/5/2017	1.13	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-905	2.05	n/a	10/3/2017	1.89	No	8	0	x^4	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-901	59.2	n/a	10/3/2017	58.2	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-902	70.7	n/a	10/3/2017	69.2	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-903	358	n/a	10/3/2017	344	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-904	86.7	n/a	10/5/2017	71.8	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-905	58.8	n/a	10/3/2017	52.3	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-901	51.5	n/a	10/3/2017	22.9	No	8	0	n/a	0.00591	NP Intra (normality) ...
CHLORIDE (mg/l)	MW-902	35.2	n/a	10/3/2017	34.6	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-903	27	n/a	10/3/2017	26.3	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-904	40.6	n/a	10/5/2017	34.1	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-905	52.7	n/a	12/12/2017	52	No	8	0	n/a	0.00591	NP Intra (normality) ...
DISSOLVED SOLIDS (mg/l)	MW-901	701	n/a	10/3/2017	544	No	8	0	n/a	0.00591	NP Intra (normality) ...
DISSOLVED SOLIDS (mg/l)	MW-902	564	n/a	10/3/2017	541	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-903	2178	n/a	10/3/2017	2070	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-904	808	n/a	10/5/2017	727	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-905	685	n/a	10/3/2017	662	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-901	0.572	n/a	10/3/2017	0.483	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-902	0.572	n/a	10/3/2017	0.466	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-903	0.132	n/a	10/3/2017	0.05ND	No	8	62.5	n/a	0.00591	NP Intra (NDs) 1 of 3
FLUORIDE (mg/l)	MW-904	0.451	n/a	10/5/2017	0.29	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-905	0.611	n/a	10/3/2017	0.569	No	8	0	No	0.00188	Param Intra 1 of 3
pH (SU)	**MW-901**	**7.79**	**6.95**	**1/9/2018**	**6.84**	**Yes**	**8**	**0**	**No**	**0.00094**	**Param Intra 1 of 3**
pH (SU)	MW-902	7.62	6.62	1/9/2018	6.99	No	8	0	No	0.00094	Param Intra 1 of 3
pH (SU)	MW-903	7.37	6.18	1/9/2018	6.87	No	8	0	No	0.00094	Param Intra 1 of 3
pH (SU)	MW-904	7.37	7.06	12/12/2017	7.18	No	8	0	n/a	0.0118	NP Intra (normality) ...
pH (SU)	MW-905	8.37	6.61	12/12/2017	7.46	No	8	0	No	0.00094	Param Intra 1 of 3
SULFATE (mg/l)	MW-901	33.8	n/a	10/3/2017	14.9	No	8	0	n/a	0.00591	NP Intra (normality) ...
SULFATE (mg/l)	**MW-902**	**36**	**n/a**	**1/9/2018**	**37.9**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
SULFATE (mg/l)	MW-903	1153	n/a	10/3/2017	1010	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-904	139	n/a	10/5/2017	100	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-905	59.7	n/a	10/3/2017	26.6	No	8	0	x^(1/3)	0.00188	Param Intra 1 of 3

ATTACHMENT 2

Sanitas™ Configuration Settings

Options

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Exclude data flags:

Data Reading Options

- (•) Individual Observations
- ( ) Mean of Each: ( ) Month
- ( ) Median of Each: ( ) Season

Non-Detect / Trace Handling...

Setup Seasons...

[ ] Automatically Process Resamples...

OK | Cancel | Save Settings As... | Load Saved Settings... | Defaults... | Edit INI File | 

Options

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

- [ ] Black and White Output
- [x] Four Plots Per Page
  - [ ] Always Combine Data Pages...
  - [x] Include Tick Marks on Data Page
  - [ ] Use Constituent Name for Graph Title
- [ ] Draw Border Around Text Reports and Data Pages
- [x] Enlarge/Reduce Fonts (Graphs): 100%
- [x] Enlarge/Reduce Fonts (Data/Text Reports): 100%
- [x] Wide Margins (on reports without explicit setting)
- [ ] Use CAS# (Not Const. Name)
- [ ] Truncate File Names to 20 Characters
- [ ] Include Limit Lines when found in Database...
- [x] Show Deselected Data on Time Series Lighter
- [x] Show Deselected Data on all Data Pages Lighter

Setup Symbols and Colors...

- [x] Prompt to Overwrite/Append Summary Tables
- [ ] Round Limits to 2 Sig. Digits (when not set in data file)
- [ ] User-Set Scale
- [x] Indicate Background Data
- [ ] Show Exact Dates
- [ ] Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision

- (•) Less Precision
- ( ) Normal Precision
- ( ) More Precision

- [x] Store Print Jobs in Multiple Constituent Mode

Store All Print Jobs...

Printer: Adobe PDF

Printers...

OK | Cancel | Save Settings As... | Load Saved Settings... | Defaults... | Edit INI File

Options

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

- [x] Test for Normality — using Shapiro-Wilk/Francia — at Alpha = 0.01
- [x] Use Non-Parametric Test when Non-Detects Percent > 50
- Use Aitchison's Adjustment when Non-Detects Percent > 15
- [ ] Optional Further Refinement: Use ____ when NDs % > 50
- [ ] Use Poisson Prediction Limit when Non-Detects Percent > 0

Transformation
- (•) Use Ladder of Powers
- ( ) Natural Log or No Transformation
- ( ) Never Transform
- ( ) Use Specific Transformation: Natural Log
- [ ] Use Best W Statistic
- [ ] Plot Transformed Values

Deseasonalize (Intra- and InterWell)
- (•) If Seasonality Is Detected
- ( ) If Seasonality Is Detected Or Insufficient to Test
- ( ) Always (When Sufficient Data)
- ( ) Never

- [ ] Always Use Non-Parametric

Facility α
- Statistical Evaluations per Year: 2
- Constituents Analyzed: 7
- Downgradient (Compliance) Wells: 4

Sampling Plan
- Comparing: Individual Observations
- ( ) 1 of 1 ( ) 1 of 2 (•) 1 of 3 ( ) 1 of 4
- ( ) 2 of 4 ("Modified California")

IntraWell Other
- [ ] Stop if Background Trend Detected at Alpha = 0.05
- [x] Plot Background Data
- Override Standard Deviation:
- Override DF: Override Kappa:

- [ ] Automatically Remove Background Outliers
- [ ] 2-Tailed Test Mode...
- [ ] Show Deselected Data Lighter

Non-Parametric Limit = Highest Background Value

Non-Parametric Limit when 100% Non-Detects:
- ( ) Highest/Second Highest Background Value
- (•) Most Recent PQL if available, or MDL
- ( ) Most Recent Background Value (subst. method)

OK | Cancel | Save Settings As... | Load Saved Settings... | Defaults... | Edit INI File | 🖶

Options

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney

- [ ] Use Modified Alpha...
- [ ] 2-Tailed Test Mode...

Outlier Tests

- ( ) EPA 1989 Outlier Screening (fixed alpha of 0.05)
- (•) Dixon's at α= 0.05 or if n > 22 Rosner's at α= 0.01 [x] Use EPA Screening to establish Suspected Outliers
- ( ) Tukey's Outlier Screening, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] Test For Normality using Shapiro-Wilk/Francia at Alpha = 0.1
  - (•) Stop if Non-Normal
  - ( ) Continue with Parametric Test if Non-Normal
  - ( ) Tukey's if Non-Normal, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] No Outlier If Less Than 3.0 Times Median
- [ ] Apply Rules found in Ohio Guidance Document 0715
- [ ] Combine Background Wells on the Outlier Report...

Piper, Stiff Diagram

- [ ] Combine Wells
- [ ] Combine Dates
- (•) Use Default Constituent Names
- ( ) Use Constituent Definition File Edit
- [x] Label Constituents
- [x] Label Axes
- [x] Note Cation-Anion Balance (Piper only)

OK | Cancel | Save Settings As... | Load Saved Settings... | Defaults... | Edit INI File

Jared Morrison
December 16, 2022

ATTACHMENT 2-2

Spring 2018 Semiannual Detection Monitoring Statistical Analyses

MEMORANDUM

September 12, 2018

To: La Cygne Generating Station
25166 East 2200 Road
La Cygne, Kansas 66040
Kansas City Power & Light Company

From: SCS Engineers

RE: Determination of Statistically Significant Increases –
Bottom Ash Impoundment
Spring 2018 Semiannual Detection Monitoring 40 CFR 257.94

Statistical analysis of monitoring data from the groundwater monitoring system for the Bottom Ash Impoundment at the La Cygne Generating Station has been completed in substantial compliance with the "Statistical Method Certification b y A Qualified Professional Engineer" dated October 12, 2017. Detection monitoring groundwater samples were collected on May 23, 2018. Review and validation of the results from the May 2018 Detection Monitoring Event was completed on June 15, 2018, 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 11, 2018 and August 16, 2018.

The completed statistical evaluation identified Appendix III constituent, calcium, above its prediction limit in monitoring well MW-903. The prediction limit for calcium in monitoring well MW-903 is 358 mg/L. The detection monitoring sample was reported at 368 mg/L. The first verification re-sample was collected on July 11, 2018 with a result of 371 mg/L. The second verification re-sample was collected on August 16, 2018 with a result of 382 mg/L.

Therefore, in accordance with the Statistical Method Certification, the detection monitoring sample for calcium from monitoring wells MW-903 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 one SSI above the background prediction limit for calcium in monitor well MW-903.

Attached to this memorandum are the following backup information:

Attachment 1: Sanitas™ Output:

Statistical evaluation output from Sanitas™ for the prediction limit analysis. This includes prediction limit plots, prediction limit background data, detection sample result, 1st verification re-sample result (when applicable), 2nd verification re-sample result (when applicable), extra sample results for pH because pH is collected as part of the sampling procedure, and a Prediction Limit summary table. Output documentation includes the analytical data used for the statistical analyses.

Attachment 2: Sanitas™ Configuration Settings:

Screen shots of the applicable Sanitas™ configuration settings for the statistical prediction limit analysis. This includes data configuration, output configuration, prediction limit configuration and other tests configuration.

Revision Number	Revision Date	Attachment Revised	Summary of Revisions

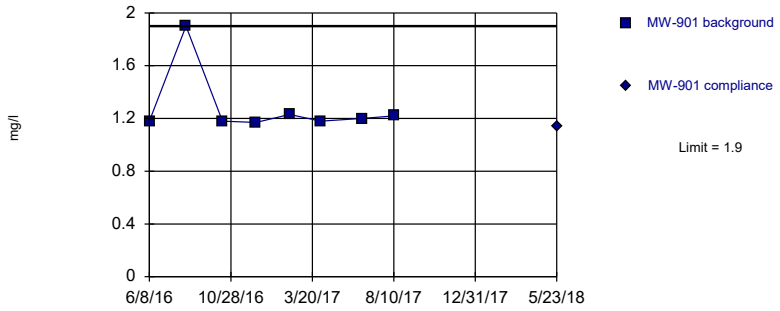
ATTACHMENT 1

Sanitas™ Output

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

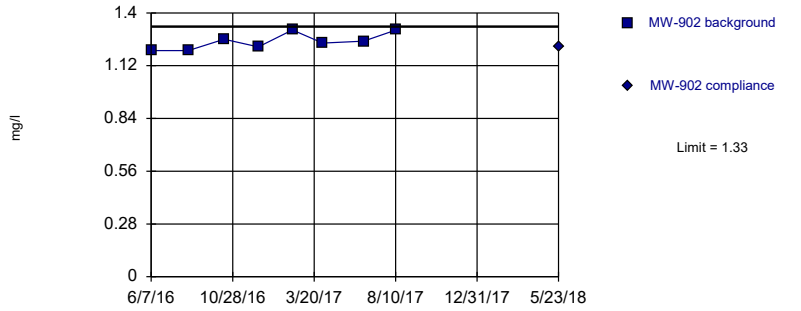
Constituent: BORON Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.6.09 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.25, Std. Dev.=0.0436, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.893, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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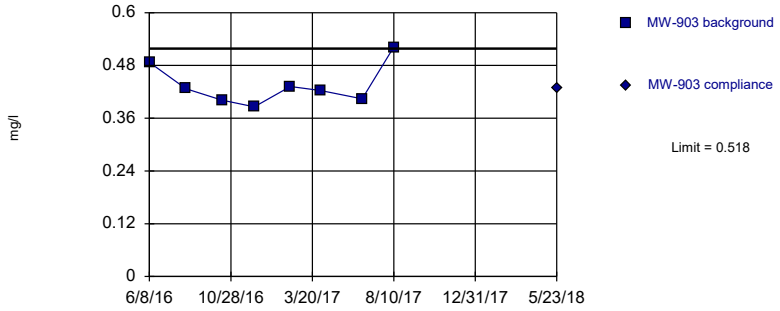
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.435, Std. Dev.=0.046, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.876, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

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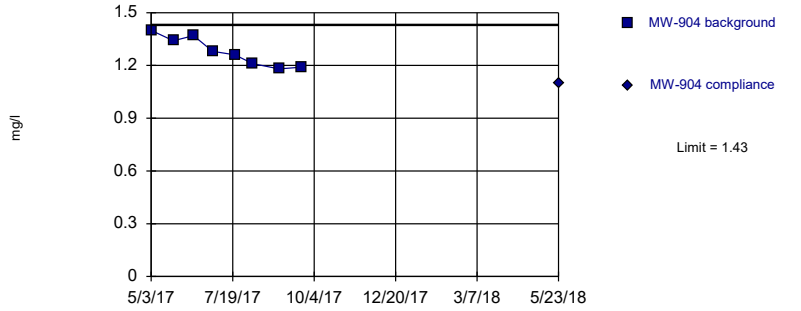
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1.28, Std. Dev.=0.0841, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.924, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	1.18	
8/11/2016	1.9	
10/14/2016	1.18	
12/12/2016	1.17	
2/9/2017	1.23	
4/4/2017	1.18	
6/16/2017	1.2	
8/11/2017	1.22	
5/23/2018		1.14

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	1.2	
8/11/2016	1.2	
10/13/2016	1.26	
12/12/2016	1.22	
2/10/2017	1.31	
4/4/2017	1.24	
6/15/2017	1.25	
8/11/2017	1.31	
5/23/2018		1.22

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	0.487	
8/11/2016	0.427	
10/13/2016	0.401	
12/9/2016	0.386	
2/10/2017	0.432	
4/4/2017	0.423	
6/16/2017	0.404	
8/10/2017	0.521	
5/23/2018		0.428

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

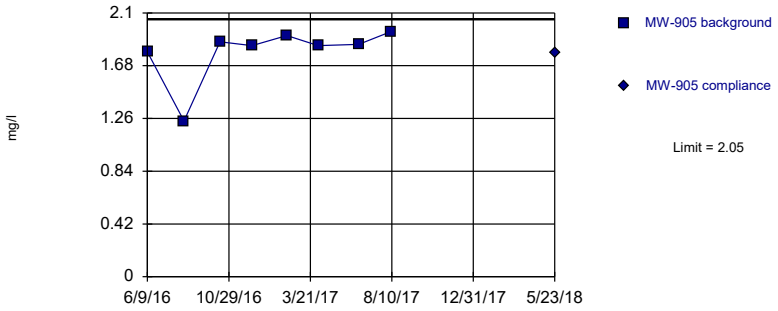
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	1.4	
5/24/2017	1.34	
6/12/2017	1.37	
6/30/2017	1.28	
7/21/2017	1.26	
8/7/2017	1.21	
9/1/2017	1.18	
9/22/2017	1.19	
5/23/2018		1.1

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on x^4 transformation): Mean=10.9, Std. Dev.=3.71, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.754, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: BORON Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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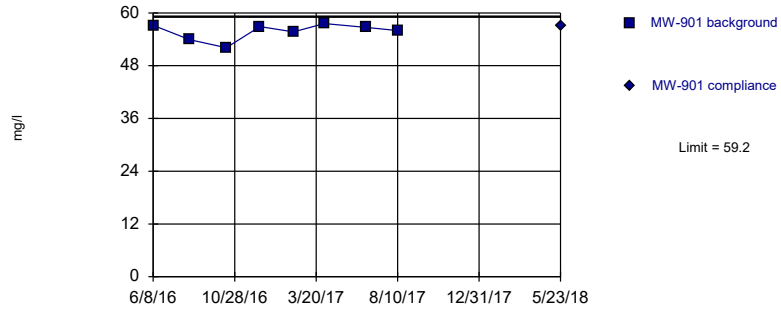
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=55.8, Std. Dev.=1.87, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.87, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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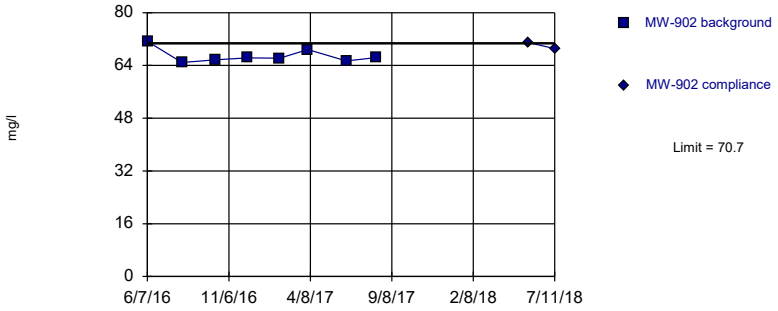
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=66.9, Std. Dev.=2.13, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.812, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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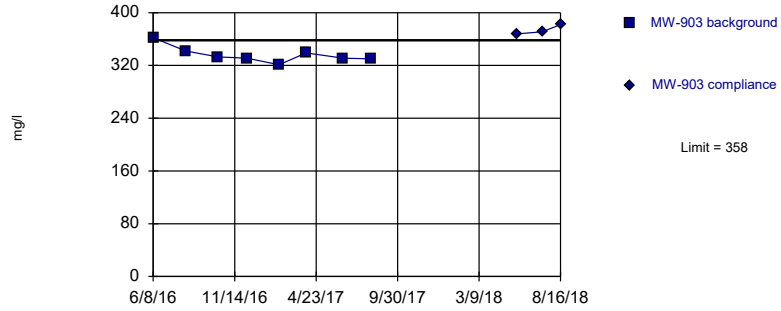
Exceeds Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=336, Std. Dev.=12.2, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.871, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: BORON (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	1.79	
8/12/2016	1.24	
10/14/2016	1.87	
12/9/2016	1.84	
2/8/2017	1.92	
4/4/2017	1.84	
6/14/2017	1.85	
8/9/2017	1.95	
5/23/2018		1.78

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	57.2	
8/11/2016	53.9	
10/14/2016	52.1	
12/12/2016	56.9	
2/9/2017	55.7	
4/4/2017	57.6	
6/16/2017	56.7	
8/11/2017	56	
5/23/2018		57.1

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902	
6/7/2016	71.3		
8/11/2016	64.9		
10/13/2016	65.7		
12/12/2016	66.3		
2/10/2017	66.2		
4/4/2017	68.8		
6/15/2017	65.4		
8/11/2017	66.4		
5/23/2018		70.9	
7/11/2018		69.1	1st verification re-sample

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

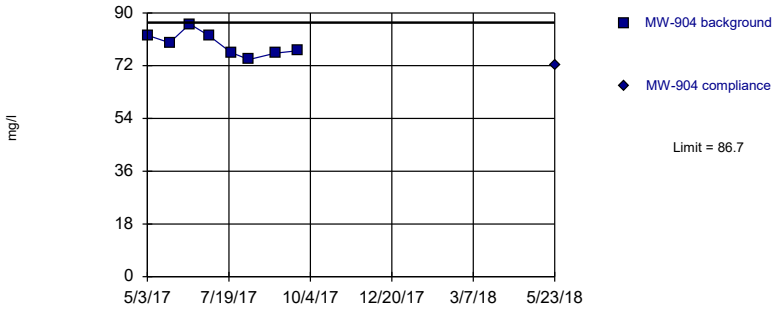
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903	
6/8/2016	362		
8/11/2016	342		
10/13/2016	333		
12/9/2016	331		
2/10/2017	321		
4/4/2017	339		
6/16/2017	331		
8/10/2017	330		
5/23/2018		368	
7/11/2018		371	1st verification re-sample
8/16/2018		382	2nd verification re-sample

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=79.3, Std. Dev.=4.06, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.942, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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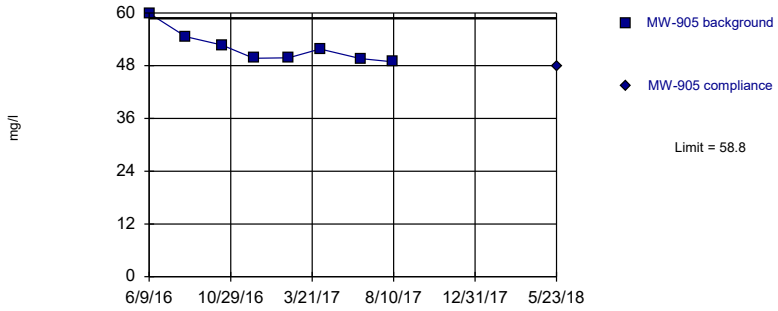
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=52.1, Std. Dev.=3.69, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.828, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CALCIUM Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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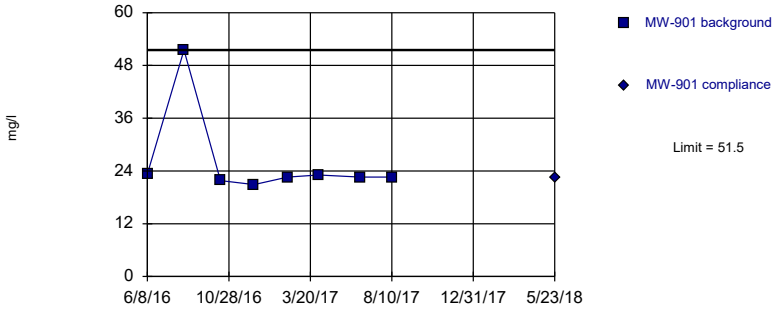
Within Limit

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: CHLORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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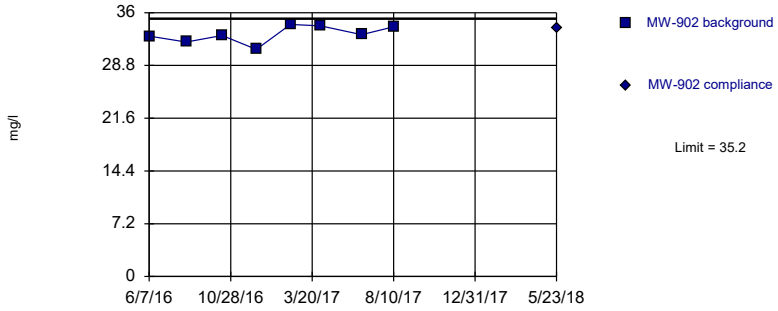
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=33.1, Std. Dev.=1.17, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.925, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	82.4	
5/24/2017	79.8	
6/12/2017	86.2	
6/30/2017	82.3	
7/21/2017	76.5	
8/7/2017	74.1	
9/1/2017	76.3	
9/22/2017	77.1	
5/23/2018		72.2

Prediction Limit

Constituent: CALCIUM (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	59.9	
8/12/2016	54.6	
10/14/2016	52.7	
12/9/2016	49.7	
2/8/2017	49.8	
4/4/2017	51.8	
6/14/2017	49.6	
8/9/2017	48.9	
5/23/2018		47.8

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	23.3	
8/11/2016	51.5	
10/14/2016	21.8	
12/12/2016	20.9	
2/9/2017	22.6	
4/4/2017	23.1	
6/16/2017	22.6	
8/11/2017	22.6	
5/23/2018		22.6

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

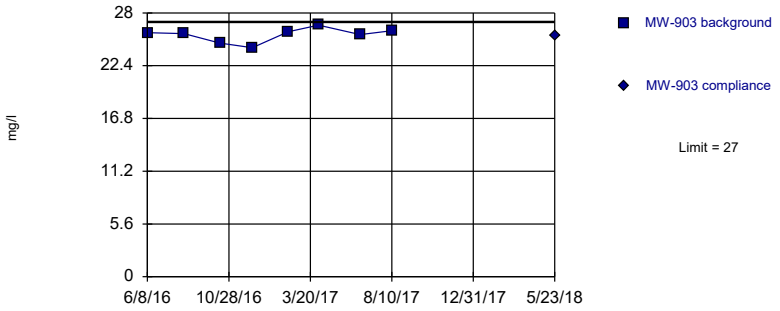
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	32.8	
8/11/2016	32	
10/13/2016	32.9	
12/12/2016	31	
2/10/2017	34.4	
4/4/2017	34.2	
6/15/2017	33	
8/11/2017	34.1	
5/23/2018		33.9

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=25.7, Std. Dev.=0.761, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.91, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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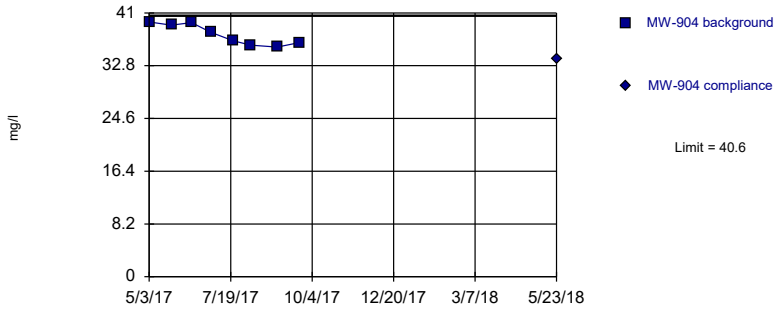
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=37.6, Std. Dev.=1.62, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.873, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: CHLORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

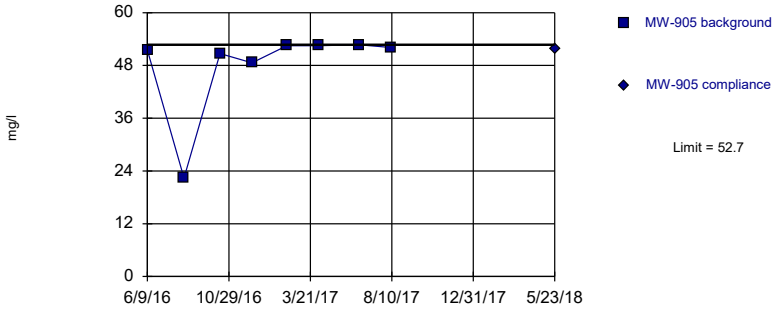
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.6.09 Sanitas software licensed to SCS Engineers. UG

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: CHLORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

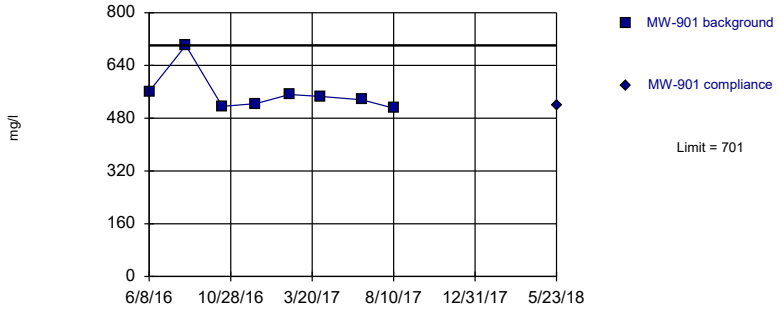
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.6.09 Sanitas software licensed to SCS Engineers. UG

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 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: DISSOLVED SOLIDS Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	25.9	
8/11/2016	25.8	
10/13/2016	24.8	
12/9/2016	24.3	
2/10/2017	26	
4/4/2017	26.7	
6/16/2017	25.7	
8/10/2017	26.1	
5/23/2018		25.6

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	39.6	
5/24/2017	39.1	
6/12/2017	39.5	
6/30/2017	38	
7/21/2017	36.7	
8/7/2017	36	
9/1/2017	35.7	
9/22/2017	36.4	
5/23/2018		33.8

Prediction Limit

Constituent: CHLORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	51.5	
8/12/2016	22.4	
10/14/2016	50.7	
12/9/2016	48.6	
2/8/2017	52.5	
4/4/2017	52.5	
6/14/2017	52.7	
8/9/2017	52.1	
5/23/2018		51.9

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

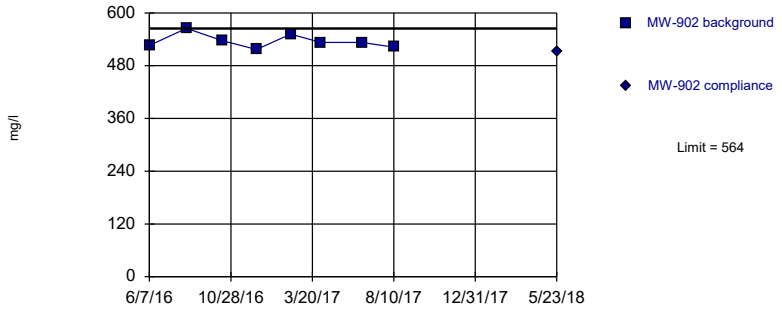
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	561	
8/11/2016	701	
10/14/2016	516	
12/12/2016	524	
2/9/2017	552	
4/4/2017	546	
6/16/2017	536	
8/11/2017	510	
5/23/2018		520

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=536, Std. Dev.=15.9, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.924, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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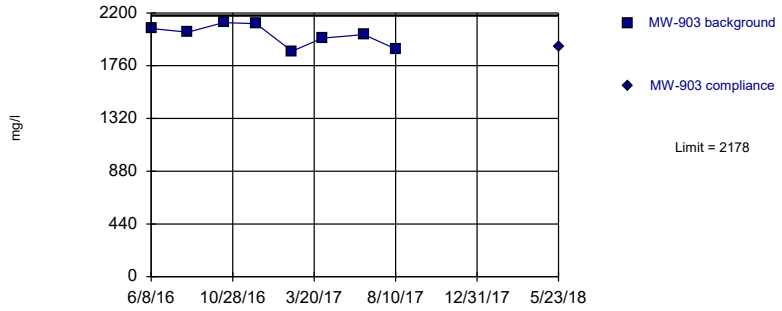
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=2016, Std. Dev.=89.3, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.922, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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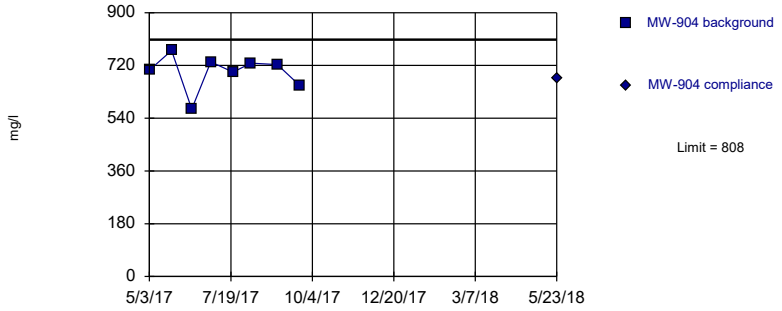
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=697, Std. Dev.=61.3, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.888, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

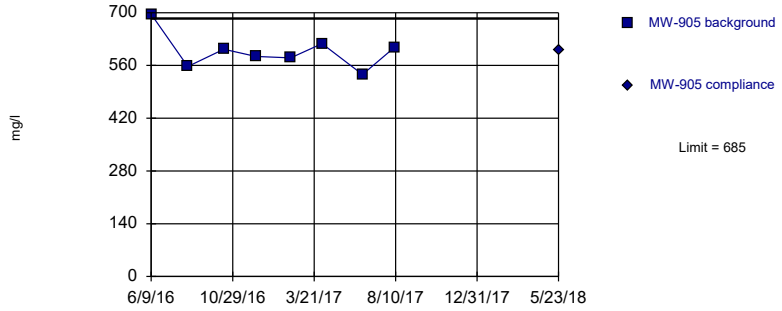
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.6.09 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=598, Std. Dev.=48.1, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.921, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: DISSOLVED SOLIDS Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	526	
8/11/2016	565	
10/13/2016	537	
12/12/2016	517	
2/10/2017	552	
4/4/2017	533	
6/15/2017	533	
8/11/2017	522	
5/23/2018		511

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	2070	
8/11/2016	2040	
10/13/2016	2120	
12/9/2016	2110	
2/10/2017	1880	
4/4/2017	1990	
6/16/2017	2020	
8/10/2017	1900	
5/23/2018		1920

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	704	
5/24/2017	771	
6/12/2017	571	
6/30/2017	732	
7/21/2017	697	
8/7/2017	728	
9/1/2017	723	
9/22/2017	652	
5/23/2018		677

Prediction Limit

Constituent: DISSOLVED SOLIDS (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

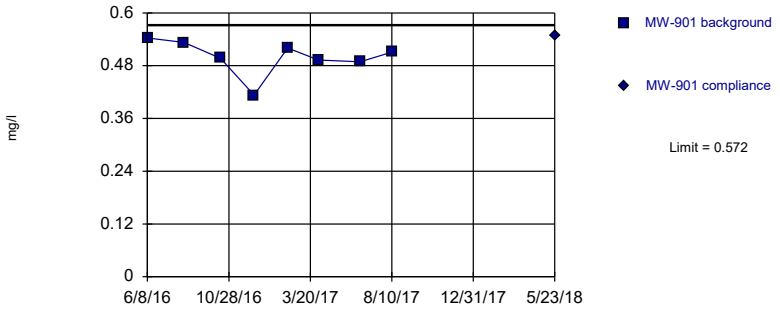
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	696	
8/12/2016	557	
10/14/2016	603	
12/9/2016	584	
2/8/2017	580	
4/4/2017	618	
6/14/2017	536	
8/9/2017	608	
5/23/2018		602

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.5, Std. Dev.=0.04, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.859, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

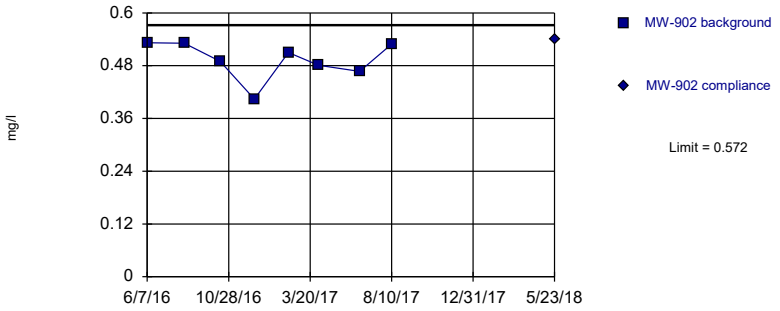
Constituent: FLUORIDE Analysis Run 8/27/2018 3:43 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.493, Std. Dev.=0.0437, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.862, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

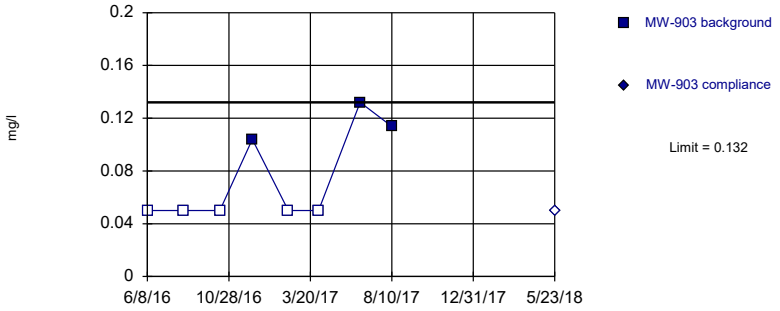
LaCygne Client: SCS Engineers Data: LaC GW Data

Hollow symbols indicate censored values.

Within Limit

Prediction Limit

Intrawell Non-parametric



Non-parametric test used in lieu of parametric prediction limit because censored data exceeded 50%. Limit is highest of 8 background values. 62.5% NDs. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

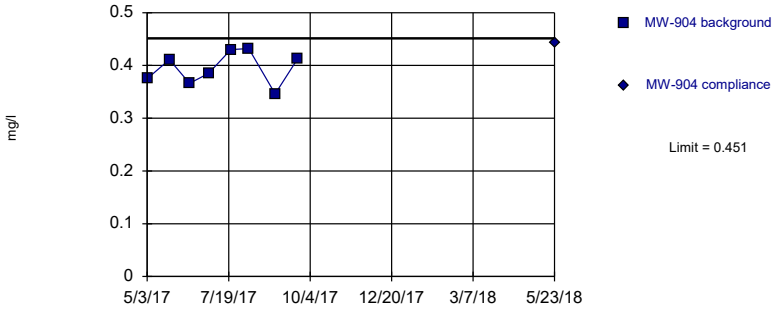
Constituent: FLUORIDE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.395, Std. Dev.=0.0314, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.935, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: FLUORIDE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	0.543	
8/11/2016	0.533	
10/14/2016	0.497	
12/12/2016	0.413	
2/9/2017	0.52	
4/4/2017	0.493	
6/16/2017	0.489	
8/11/2017	0.511	
5/23/2018		0.547

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	0.532	
8/11/2016	0.531	
10/13/2016	0.49	
12/12/2016	0.404	
2/10/2017	0.51	
4/4/2017	0.481	
6/15/2017	0.467	
8/11/2017	0.53	
5/23/2018		0.541

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	<0.1	
8/11/2016	<0.1	
10/13/2016	<0.1	
12/9/2016	0.104	
2/10/2017	<0.1	
4/4/2017	<0.1	
6/16/2017	0.132	
8/10/2017	0.114	
5/23/2018		<0.1

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

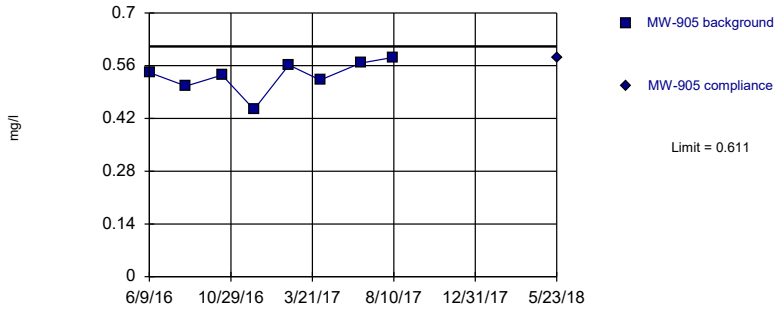
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	0.375	
5/24/2017	0.411	
6/12/2017	0.366	
6/30/2017	0.385	
7/21/2017	0.43	
8/7/2017	0.432	
9/1/2017	0.346	
9/22/2017	0.412	
5/23/2018		0.444

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=0.533, Std. Dev.=0.0435, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.916, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

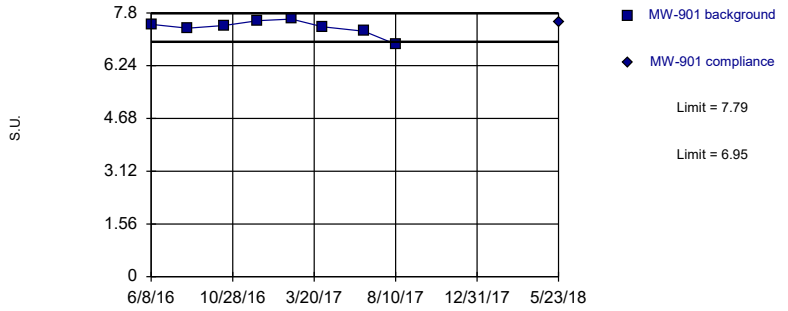
Constituent: FLUORIDE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.37, Std. Dev.=0.232, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.872, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

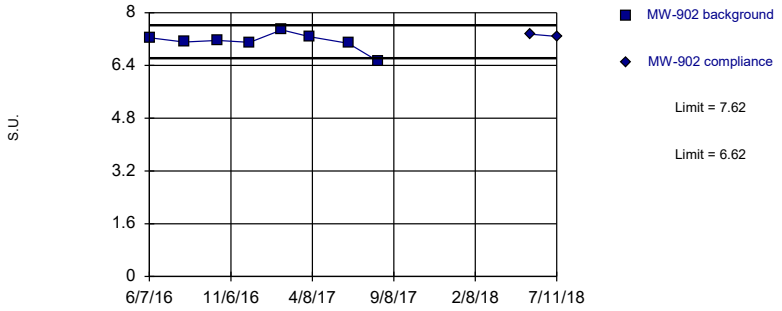
Constituent: pH Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=7.12, Std. Dev.=0.275, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.849, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

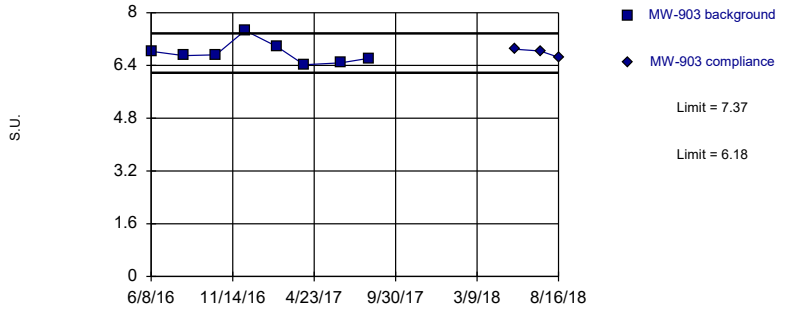
Constituent: pH Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=6.78, Std. Dev.=0.329, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.894, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: pH Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: FLUORIDE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	0.542	
8/12/2016	0.506	
10/14/2016	0.535	
12/9/2016	0.444	
2/8/2017	0.562	
4/4/2017	0.522	
6/14/2017	0.567	
8/9/2017	0.582	
5/23/2018		0.581

Prediction Limit

Constituent: pH (S.U.) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	7.46	
8/11/2016	7.35	
10/14/2016	7.43	
12/12/2016	7.57	
2/9/2017	7.62	
4/4/2017	7.39	
6/16/2017	7.26	
8/11/2017	6.87	
5/23/2018		7.53

Prediction Limit

Constituent: pH (S.U.) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902	
6/7/2016	7.24		
8/11/2016	7.11		
10/13/2016	7.16		
12/12/2016	7.1		
2/10/2017	7.48		
4/4/2017	7.27		
6/15/2017	7.07		
8/11/2017	6.52		
5/23/2018		7.35	
7/11/2018		7.28	extra sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

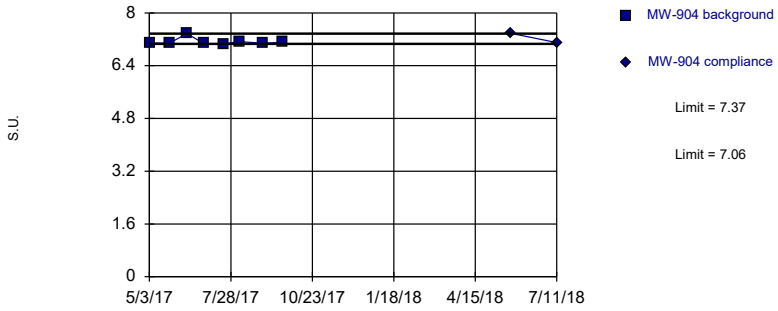
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903	
6/8/2016	6.83		
8/11/2016	6.7		
10/13/2016	6.72		
12/9/2016	7.46		
2/10/2017	6.97		
4/4/2017	6.42		
6/15/2017	6.48		
8/10/2017	6.62		
5/23/2018		6.89	
7/11/2018		6.84	extra sample
8/16/2018		6.65	extra sample

Within Limits

Prediction Limit

Intrawell Non-parametric



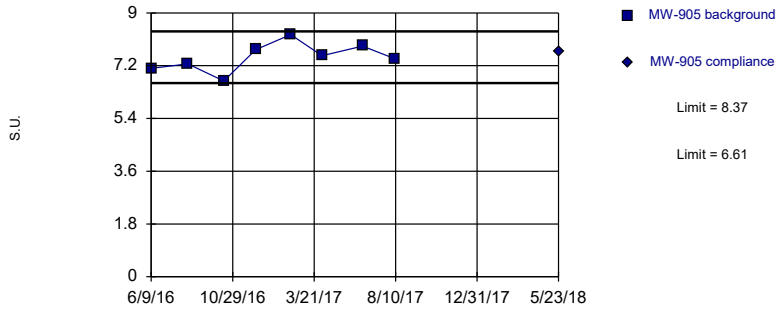
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limits are highest and lowest of 8 background values. Well-constituent pair annual alpha = 0.0236. Individual comparison alpha = 0.0118 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: pH Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limits

Prediction Limit

Intrawell Parametric



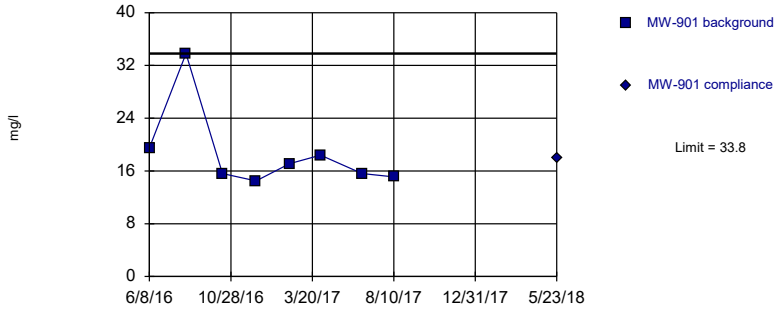
Background Data Summary: Mean=7.49, Std. Dev.=0.487, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.997, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: pH Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Non-parametric



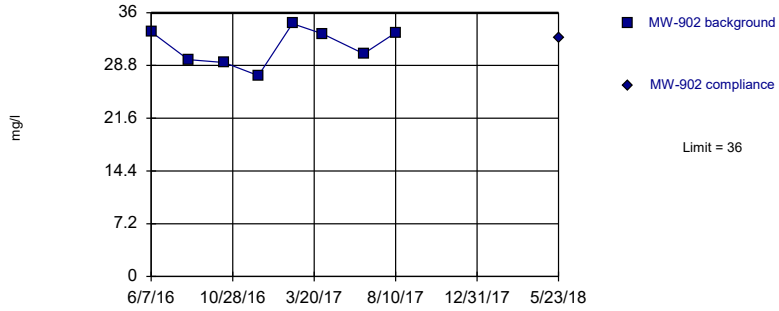
Non-parametric test used in lieu of parametric prediction limit because the Shapiro Wilk normality test showed the data to be non-normal at the 0.01 alpha level. Limit is highest of 8 background values. Well-constituent pair annual alpha = 0.0118. Individual comparison alpha = 0.00591 (1 of 3). Insufficient data to test for seasonality: data were not deseasonalized.

Constituent: SULFATE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=31.4, Std. Dev.=2.54, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.913, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III
LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: pH (S.U.) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904	
5/3/2017	7.09		
5/24/2017	7.08		
6/12/2017	7.37		
6/30/2017	7.07		
7/21/2017	7.06		
8/7/2017	7.13		
9/1/2017	7.08		
9/22/2017	7.11		
5/23/2018		7.38	
7/11/2018		7.1	1st verification re-sample

Prediction Limit

Constituent: pH (S.U.) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	7.11	
8/12/2016	7.26	
10/14/2016	6.68	
12/9/2016	7.75	
2/8/2017	8.26	
4/4/2017	7.54	
6/14/2017	7.87	
8/9/2017	7.44	
5/23/2018		7.68

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-901	MW-901
6/8/2016	19.5	
8/11/2016	33.8	
10/14/2016	15.6	
12/12/2016	14.5	
2/9/2017	17.1	
4/4/2017	18.4	
6/16/2017	15.6	
8/11/2017	15.1	
5/23/2018		17.9

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

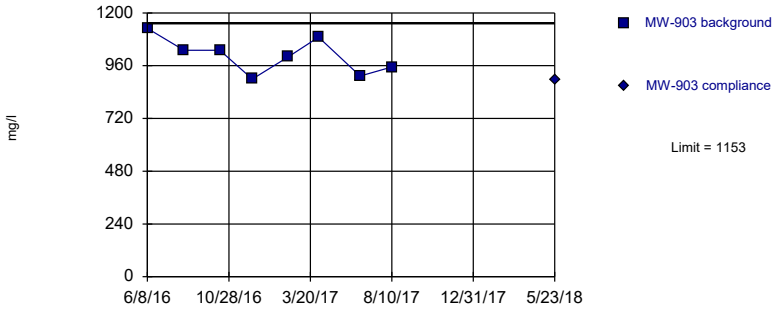
LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-902	MW-902
6/7/2016	33.4	
8/11/2016	29.6	
10/13/2016	29.2	
12/12/2016	27.4	
2/10/2017	34.5	
4/4/2017	33.1	
6/15/2017	30.4	
8/11/2017	33.3	
5/23/2018		32.5

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=1006, Std. Dev.=81.4, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.957, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

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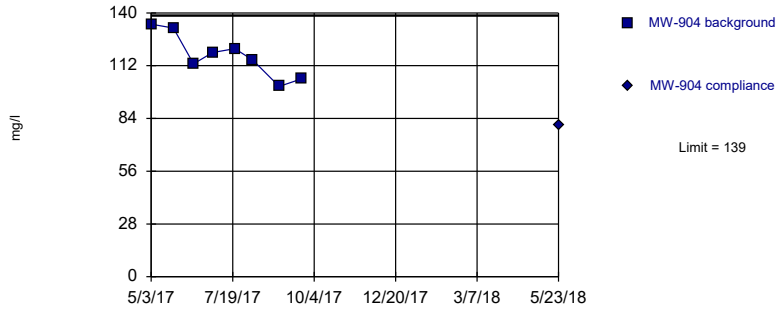
Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary: Mean=118, Std. Dev.=11.7, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.954, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

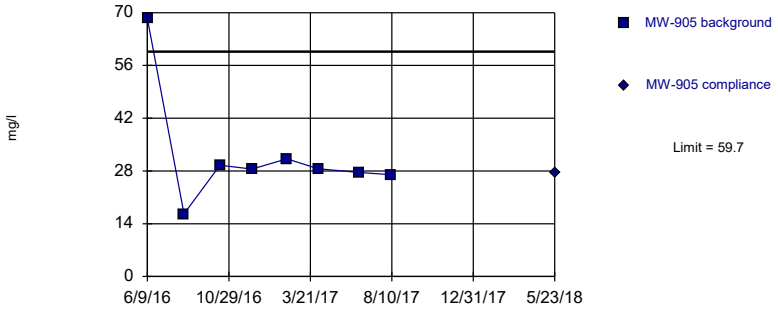
LaCygne Client: SCS Engineers Data: LaC GW Data

Sanitas™ v.9.6.09 Sanitas software licensed to SCS Engineers. UG

Within Limit

Prediction Limit

Intrawell Parametric



Background Data Summary (based on cube root transformation): Mean=3.13, Std. Dev.=0.431, n=8. Insufficient data to test for seasonality: data were not deseasonalized. Normality test: Shapiro Wilk @alpha = 0.01, calculated = 0.755, critical = 0.749. Kappa = 1.81 (c=7, w=4, 1 of 3, event alpha = 0.0513). Report alpha = 0.00188.

Constituent: SULFATE Analysis Run 8/27/2018 3:44 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-903	MW-903
6/8/2016	1130	
8/11/2016	1030	
10/13/2016	1030	
12/9/2016	899	
2/10/2017	1000	
4/4/2017	1090	
6/16/2017	913	
8/10/2017	954	
5/23/2018		896

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-904	MW-904
5/3/2017	134	
5/24/2017	132	
6/12/2017	113	
6/30/2017	119	
7/21/2017	121	
8/7/2017	115	
9/1/2017	101	
9/22/2017	105	
5/23/2018		80.7

Prediction Limit

Constituent: SULFATE (mg/l) Analysis Run 8/27/2018 3:49 PM View: Bottom Ash III

LaCygne Client: SCS Engineers Data: LaC GW Data

	MW-905	MW-905
6/9/2016	68.5	
8/12/2016	16.6	
10/14/2016	29.5	
12/9/2016	28.5	
2/8/2017	31.2	
4/4/2017	28.6	
6/14/2017	27.6	
8/9/2017	27	
5/23/2018		27.5

Prediction Limit

LaCygne Client: SCS Engineers Data: LaC GW Data Printed 8/27/2018, 3:49 PM

Constituent	Well	Upper Lim.	Lower Lim.	Date	Observ.	Sig.	Bg N	%NDs	Transform	Alpha	Method
BORON (mg/l)	MW-901	1.9	n/a	5/23/2018	1.14	No	8	0	n/a	0.00591	NP Intra (normality) ...
BORON (mg/l)	MW-902	1.33	n/a	5/23/2018	1.22	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-903	0.518	n/a	5/23/2018	0.428	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-904	1.43	n/a	5/23/2018	1.1	No	8	0	No	0.00188	Param Intra 1 of 3
BORON (mg/l)	MW-905	2.05	n/a	5/23/2018	1.78	No	8	0	x^4	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-901	59.2	n/a	5/23/2018	57.1	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-902	70.7	n/a	7/11/2018	69.1	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	**MW-903**	**358**	**n/a**	**8/16/2018**	**382**	**Yes**	**8**	**0**	**No**	**0.00188**	**Param Intra 1 of 3**
CALCIUM (mg/l)	MW-904	86.7	n/a	5/23/2018	72.2	No	8	0	No	0.00188	Param Intra 1 of 3
CALCIUM (mg/l)	MW-905	58.8	n/a	5/23/2018	47.8	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-901	51.5	n/a	5/23/2018	22.6	No	8	0	n/a	0.00591	NP Intra (normality) ...
CHLORIDE (mg/l)	MW-902	35.2	n/a	5/23/2018	33.9	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-903	27	n/a	5/23/2018	25.6	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-904	40.6	n/a	5/23/2018	33.8	No	8	0	No	0.00188	Param Intra 1 of 3
CHLORIDE (mg/l)	MW-905	52.7	n/a	5/23/2018	51.9	No	8	0	n/a	0.00591	NP Intra (normality) ...
DISSOLVED SOLIDS (mg/l)	MW-901	701	n/a	5/23/2018	520	No	8	0	n/a	0.00591	NP Intra (normality) ...
DISSOLVED SOLIDS (mg/l)	MW-902	564	n/a	5/23/2018	511	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-903	2178	n/a	5/23/2018	1920	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-904	808	n/a	5/23/2018	677	No	8	0	No	0.00188	Param Intra 1 of 3
DISSOLVED SOLIDS (mg/l)	MW-905	685	n/a	5/23/2018	602	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-901	0.572	n/a	5/23/2018	0.547	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-902	0.572	n/a	5/23/2018	0.541	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-903	0.132	n/a	5/23/2018	0.05ND	No	8	62.5	n/a	0.00591	NP Intra (NDs) 1 of 3
FLUORIDE (mg/l)	MW-904	0.451	n/a	5/23/2018	0.444	No	8	0	No	0.00188	Param Intra 1 of 3
FLUORIDE (mg/l)	MW-905	0.611	n/a	5/23/2018	0.581	No	8	0	No	0.00188	Param Intra 1 of 3
pH (S.U.)	MW-901	7.79	6.95	5/23/2018	7.53	No	8	0	No	0.00094	Param Intra 1 of 3
pH (S.U.)	MW-902	7.62	6.62	7/11/2018	7.28	No	8	0	No	0.00094	Param Intra 1 of 3
pH (S.U.)	MW-903	7.37	6.18	8/16/2018	6.65	No	8	0	No	0.00094	Param Intra 1 of 3
pH (S.U.)	MW-904	7.37	7.06	7/11/2018	7.1	No	8	0	n/a	0.0118	NP Intra (normality) ...
pH (S.U.)	MW-905	8.37	6.61	5/23/2018	7.68	No	8	0	No	0.00094	Param Intra 1 of 3
SULFATE (mg/l)	MW-901	33.8	n/a	5/23/2018	17.9	No	8	0	n/a	0.00591	NP Intra (normality) ...
SULFATE (mg/l)	MW-902	36	n/a	5/23/2018	32.5	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-903	1153	n/a	5/23/2018	896	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-904	139	n/a	5/23/2018	80.7	No	8	0	No	0.00188	Param Intra 1 of 3
SULFATE (mg/l)	MW-905	59.7	n/a	5/23/2018	27.5	No	8	0	x^(1/3)	0.00188	Param Intra 1 of 3

ATTACHMENT 2

Sanitas™ Configuration Settings

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Exclude data flags:

Data Reading Options

- (•) Individual Observations
- ( ) Mean of Each: ( ) Month
- ( ) Median of Each: ( ) Season

Non-Detect / Trace Handling...

Setup Seasons...

[ ] Automatically Process Resamples...

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

- [ ] Black and White Output
- [x] Four Plots Per Page
  - [ ] Always Combine Data Pages...
  - [x] Include Tick Marks on Data Page
  - [ ] Use Constituent Name for Graph Title
- [ ] Draw Border Around Text Reports and Data Pages
- [x] Enlarge/Reduce Fonts (Graphs): 100%
- [x] Enlarge/Reduce Fonts (Data/Text Reports): 100%
- [x] Wide Margins (on reports without explicit setting)
- [ ] Use CAS# (Not Const. Name)
- [ ] Truncate File Names to 20 Characters
- [ ] Include Limit Lines when found in Database...
- [x] Show Deselected Data on Time Series Lighter
- [x] Show Deselected Data on all Data Pages Lighter

Setup Symbols and Colors...

- [x] Prompt to Overwrite/Append Summary Tables
- [ ] Round Limits to 2 Sig. Digits (when not set in data file)
- [ ] User-Set Scale
- [x] Indicate Background Data
- [ ] Show Exact Dates
- [ ] Thick Plot Lines

Zoom Factor: 200%

Output Decimal Precision

- (•) Less Precision
- ( ) Normal Precision
- ( ) More Precision

- [x] Store Print Jobs in Multiple Constituent Mode

Store All Print Jobs...

Printer: Adobe PDF

Printers...

Data | Output | Trend Test | Control Cht | **Prediction Lim** | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

☑ Test for Normality using Shapiro-Wilk/Francia at Alpha = 0.01

☑ Use Non-Parametric Test when Non-Detects Percent > 50

Use Aitchison's Adjustment when Non-Detects Percent > 15

☐ Optional Further Refinement: Use _____ when NDs % > 50

☐ Use Poisson Prediction Limit when Non-Detects Percent > 0

Transformation

- (●) Use Ladder of Powers
- ( ) Natural Log or No Transformation
- ( ) Never Transform
- ( ) Use Specific Transformation: Natural Log

☐ Use Best W Statistic

☐ Plot Transformed Values

Deseasonalize (Intra- and InterWell)

- (●) If Seasonality Is Detected
- ( ) If Seasonality Is Detected Or Insufficient to Test
- ( ) Always (When Sufficient Data)
- ( ) Never

☐ Always Use Non-Parametric

Facility α

Statistical Evaluations per Year: 2

Constituents Analyzed: 7

Downgradient (Compliance) Wells: 4

Sampling Plan

Comparing Individual Observations

( ) 1 of 1 ( ) 1 of 2 (●) 1 of 3 ( ) 1 of 4

( ) 2 of 4 ("Modified California")

IntraWell Other

☐ Stop if Background Trend Detected at Alpha = 0.05

☑ Plot Background Data

Override Standard Deviation: _____

Override DF: _____ Override Kappa: _____

☐ Automatically Remove Background Outliers

☐ 2-Tailed Test Mode...

☐ Show Deselected Data Lighter

Non-Parametric Limit = Highest Background Value

Non-Parametric Limit when 100% Non-Detects:

- ( ) Highest/Second Highest Background Value
- (●) Most Recent PQL if available, or MDL
- ( ) Most Recent Background Value (subst. method)

Data | Output | Trend Test | Control Cht | Prediction Lim | Tolerance Lim | Conf/Tol Int | ANOVA | Welchs | Other Tests

Rank Von Neumann, Wilcoxon Rank Sum / Mann-Whitney

- [ ] Use Modified Alpha...
- [ ] 2-Tailed Test Mode...

Outlier Tests

- ( ) EPA 1989 Outlier Screening (fixed alpha of 0.05)
- (•) Dixon's at α= 0.05 or if n > 22 Rosner's at α= 0.01 [x] Use EPA Screening to establish Suspected Outliers
- ( ) Tukey's Outlier Screening, with IQR Multiplier = 3.0 [ ] Use Ladder of Powers to achieve Best W Stat
- [x] Test For Normality using Shapiro-Wilk/Francia at Alpha = 0.1
  - (•) Stop if Non-Normal
  - ( ) Continue with Parametric Test if Non-Normal
  - ( ) Tukey's if Non-Normal, with IQR Multiplier = 3.0 [x] Use Ladder of Powers to achieve Best W Stat
- [x] No Outlier If Less Than 3.0 Times Median
- [ ] Apply Rules found in Ohio Guidance Document 0715
- [ ] Combine Background Wells on the Outlier Report...

Piper, Stiff Diagram

- [ ] Combine Wells
- [ ] Combine Dates
- (•) Use Default Constituent Names
- ( ) Use Constituent Definition File Edit
- [x] Label Constituents
- [x] Label Axes
- [x] Note Cation-Anion Balance (Piper only)

Jared Morrison
December 16, 2022

ATTACHMENT 3

Groundwater Potentiometric Surface Maps

LEGEND

- CCR UNIT BOUNDARY (APPROXIMATE LIMITS)
- MW–704 (869.52) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- –875– GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- 16 FT/YR DIRECTION OF GROUNDWATER FLOW AND CALCULATED GROUNDWATER FLOW RATE (FEET/YEAR)

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.
4. WATER LEVEL MEASUREMENTS COMPLETED ON MAY 23, 2018

100 0 100 200
SCALE FEET

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

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (MAY 2018)
BOTTOM ASH IMPOUNDMENT

PROJECT TITLE
2018 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ADDENDUM

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. 27217233.18
DSN. BY: DAW
DWN. BY: DAW
CHK. BY: JRR
QA/QC BY: JRR
PROJ. MGR: JRF

CADD FILE:
LA CYGNE BA IMP_ALT.SOURCE_MAY.DWG

DATE:
11/14/19

FIGURE NO.
1

N:\KCPL\Projects\Groundwater\DWG\La Cygne\2018\GW\La Cygne BA Imp_Alt.Source_MAY.dwg Nov 30, 2022 - 4:16pm Layout Name: Fig 1 By: cgoeringer

LEGEND

- CCR UNIT BOUNDARY (APPROXIMATE LIMITS)
- MW-704 (869.52) CCR GROUNDWATER MONITORING SYSTEM WELLS (GROUNDWATER ELEVATION)
- -875- GROUNDWATER POTENTIOMETRIC SURFACE ELEVATIONS
- 16 FT/YR DIRECTION OF GROUNDWATER FLOW AND CALCULATED GROUNDWATER FLOW RATE (FEET/YEAR)

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.
4. WATER LEVEL MEASUREMENTS COMPLETED ON NOVEMBER 29, 2018

100 0 100 200

SCALE FEET

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

SHEET TITLE
POTENTIOMETRIC SURFACE MAP (NOVEMBER 2018) BOTTOM ASH IMPOUNDMENT

PROJECT TITLE
2018 GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT ADDENDUM

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. 27271233.18
DSN. BY: DAW
DWN. BY: DAW
CHK. BY: JRR
QA RVW BY: JRR
PROJ. MGR JRF

CADD FILE:
LA CYGNE BA IMP_ALT.SOURCE_NOVEMBER.DWG

DATE:
11/14/19

FIGURE NO.
2

N:\KCPL\Projects\Groundwater\DWG\La Cygne\2018\GW\La Cygne BA Imp_Alt.Source_NOVEMBER.dwg Nov 30, 2022 - 4:37pm Layout Name: Fig 1 By: cgoeringer