HALEY ALDRICH

www.haleyaldrich.com

2019 ANNUAL GROUNDWATER MONITORING AND CORRECTIVE ACTION REPORT
847 LANDFILL
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Evergy Kansas Central, Inc. (f/k/a Westar Energy, Inc.)
Topeka, Kansas

File No. 129778-028
January 2020

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This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Lawrence Energy Center (LEC) 847 Landfill consistent with applicable sections of § 257.90 through 257.98, and describes activities conducted in the prior calendar year (2019) and documents compliance with the United States Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2019 Annual Groundwater Monitoring and Corrective Action Report for the LEC 847 Landfill is, to the best of my knowledge, accurate and complete.

Signed:_____
Professional Geologist

Print Name:	Mark Nicholls
Kansas License No.:	Professional Geologist No. 881
Title:	Technical Expert 2
Company:	Haley & Aldrich, Inc.

1. Introduction

This 2019 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the 847 Landfill (also known as Ash Landfill 847) at the Lawrence Energy Center (LEC), operated by Evergy Kansas Central, Inc. (Evergy; f/k/a Westar Energy, Inc.). This Annual Report was developed in accordance with the United States Environmental Protection Agency Coal Combustion Residual (CCR) Rule (Rule) effective 19 October 2015 including subsequent revisions, specifically Code of Federal Regulations Title 40 (40 CFR), subsection § 257.90(e). The Annual Report documents the groundwater monitoring system for the 847 Landfill consistent with applicable sections of § 257.90 through 257.98, and describes activities conducted in the prior calendar year (2019) and documents compliance with the Rule. The specific requirements for the Annual Report listed in Sections § 257.90(e) of the Rule are provided in Section 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

2. 40 CFR § 257.90 Applicability

2.1 40 CFR § 257.90(a)

All CCR landfills, CCR surface impoundments, and lateral expansions of CCR units are subject to the groundwater monitoring and corrective action requirements under §257.90 through 257.99, except as provided in paragraph (g) [Suspension of groundwater monitoring requirements] of this section.

Evergy has installed and certified a groundwater monitoring system at the LEC 847 Landfill. The 847 Landfill is subject to the groundwater monitoring and corrective action requirements described under 40 CFR § 257.90 through 257.98. This document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e).

2.2 40 CFR § 257.90(e) – SUMMARY

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).

This Annual Report describes monitoring completed and actions taken for the groundwater monitoring system at the LEC 847 Landfill as required by the Rule. Groundwater sampling and analysis was conducted in accordance with requirements described in § 257.93, and the status of the groundwater monitoring program described in § 257.94 is provided in this report. This Annual Report documents the applicable groundwater-related activities completed in the calendar year 2019.

2.2.1 Status of the Groundwater Monitoring Program

The 847 Landfill remained in the detection monitoring program during 2019.

2.2.2 Key Actions Completed

The 2018 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2019. Statistical evaluation was completed in January 2019 on analytical data from the September 2018 detection monitoring sampling event. Semi-annual detection monitoring

events were completed in March and September 2019. Statistical evaluation was completed in July 2019 on analytical data from the March 2019 detection monitoring event. Statistical evaluation of the results from the September 2019 semi-annual detection monitoring sampling event are due to be completed in January 2020 and will be reported in the next annual report.

2.2.3 Problems Encountered

No noteworthy problems (i.e., problems could include damaged wells, issues with sample collection or lack of sampling, and problems with analytical analysis) were encountered at the 847 Landfill in 2019.

2.2.4 Actions to Resolve Problems

No problems were encountered at the 847 Landfill in 2019; therefore, no actions to resolve problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2020 include completion of the 2019 Annual Groundwater Monitoring and Corrective Action Report, statistical evaluation of detection monitoring analytical data collected in September 2019, and semi-annual detection monitoring and subsequent statistical evaluations.

2.3 40 CFR § 257.90(e) – INFORMATION

At a minimum, the annual groundwater monitoring and corrective action report must contain the following information, to the extent available:

2.3.1 40 CFR § 257.90(e)(1)

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;

As required by § 257.90(e)(1), a map showing the locations of the CCR unit and associated upgradient and downgradient monitoring wells for the 847 Landfill is included in this report as Figure 1.

2.3.2 40 CFR § 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 monitoring wells were installed or decommissioned during 2019.

2.3.3 40 CFR § 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;

In accordance with § 257.94(b), two independent detection monitoring samples from each background and downgradient monitoring well were collected during 2019. A summary including the sample names, dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program for the 847 Landfill is presented in Table I of this report.

2.3.4 40 CFR § 257.90(e)(4) – Monitoring Transition Narrative

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

There was no transition between monitoring programs in 2019. Only detection monitoring was conducted in 2019.

2.3.5 40 CFR § 257.90(e)(5) – Other Requirements

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

This Annual Report documents activities conducted to comply with § 257.90 through 257.94 of the Rule. It is understood that there are supplemental references in § 257.90 through 257.98 that must be placed in the Annual Report. The following requirements include relevant and required information in the Annual Report for the activities completed in calendar year 2019.

2.3.5.1 40 CFR § 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).

An alternative groundwater detection monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.2 40 CFR § 257.94(e)(2) – Detection Monitoring Alternate Source Demonstration

The owner or operator may demonstrate that a source other than the CCR unit caused the statistically significant increase over background levels for a constituent or that the statistically significant increase 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 statistically significant increase over background levels to include obtaining a certification from a qualified

professional engineer or approval from the Participating State Director or approval from EPA where EPA is the permitting authority verifying the accuracy of the information in the report 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 this section. 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 or approval from the Participating State Director or approval from EPA where EPA is the permitting authority.

No alternate source demonstration or certification was required in 2019; therefore, no demonstration or certification is applicable.

2.3.5.3 40 CFR § 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 approval from EPA where EPA is the permitting authority in the annual groundwater monitoring and corrective action report required by § 257.90(e).

The 847 Landfill remains in detection monitoring and an alternative groundwater assessment monitoring sampling and analysis frequency has not been established for this CCR unit; therefore, no demonstration or certification is applicable.

2.3.5.4 40 CFR § 257.95(d)(3) – Assessment Monitoring Concentrations and Groundwater Protection Standards

Include the recorded concentrations required by paragraph (d)(1) of this section, identify the background concentrations established under § 257.94(b), and identify the groundwater protection standards established under paragraph (d)(2) of this section in the annual groundwater monitoring and corrective action report required by § 257.90(e).

The 847 Landfill remains in detection monitoring, and no assessment monitoring samples were collected or analyzed in 2019. Consequently, Evergy is not required to establish groundwater protection standards for this CCR unit, and this criterion is not applicable.

2.3.5.5 40 CFR § 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 or approval from the Participating State Director or approval from EPA where EPA is the permitting authority. 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.

No assessment monitoring alternate source demonstration or certification was required in 2019. The 847 Landfill remained in detection monitoring during 2019.

2.3.5.6 40 CFR § 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 or approval from the Participating State Director or approval from EPA where EPA is the permitting authority 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.

No assessment of corrective measures was required to be initiated in 2019; therefore, no demonstration or certification is applicable for this unit.

TABLES

TABLE I

SUMMARY OF ANALYTICAL RESULTS - DETECTION MONITORING

EVERGY KANSAS CENTRAL, INC.

LAWRENCE ENERGY CENTER

847 LANDFILL

LAWRENCE, KANSAS

Location		Upgradient						Downgradient					
		MW-32		MW-35				MW-31R		MW-33		MW-34	
	Measure Point (TOC)	861.96		862.52				857.67		855.4		871.96	
	Sample Name	MW-32-031819	MW-32	MW-35-031819	DUP-031819	MW-35	DUPLICATE	MW-31R-031819	MW-31R	MW-33-031819	MW-33	MW-34-031819	MW-34
	Sample Date	3/18/2019	9/4/2019	3/18/2019	3/18/2019	9/4/2019	9/4/2019	3/18/2019	9/3/2019	3/18/2019	9/3/2019	3/18/2019	9/3/2019
Final Lab Report Date		3/27/2019	9/17/2019	3/27/2019	3/27/2019	9/17/2019	9/17/2019	3/27/2019	9/17/2019	3/27/2019	9/17/2019	3/27/2019	9/17/2019
Final Lab Report Revision Date		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lab Data Reviewed and Accepted		4/15/2019	10/21/2019	4/15/2019	4/15/2019	10/21/2019	10/21/2019	4/15/2019	10/21/2019	4/15/2019	10/21/2019	4/15/2019	10/21/2019
Depth to Water (ft btoc)		45.54	42.08	47.84	47.84	44.44	44.44	41.50	38.04	39.25	35.67	55.52	52.04
Temperature (Deg C)		14.54	15.33	14.71	14.71	14.96	14.96	14.40	15.48	14.57	18.12	14.67	18.21
Conductivity (µS/cm)		884	701	38170	38170	29120	29,120	10880	7473	20540	15170	18540	14480
Turbidity (NTU)		0.67	0.47	0.79	0.79	0.91	0.91	0.70	0.35	7.80	2.42	1.66	1.25
Boron, Total (mg/L)		**0.179**	**0.172**	**1.96**	**1.88**	**1.61**	**1.64**	**0.553**	**0.523**	**1.62**	**1.39**	**2.11**	**1.81**
Calcium, Total (mg/L)		**58.4**	**56.3**	**521**	**551**	**461**	**471**	**212**	**198**	**252**	**224**	**211**	**195**
Chloride (mg/L)		**106**	**113**	**16700**	**15900**	**13900**	**14,200**	**3980**	**3530**	**8290**	**7300**	**6960**	**6330**
Fluoride (mg/L)		**0.28**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	**0.31**	<0.20	<0.20	<0.20	**1.2**
Sulfate (mg/L)		**6.2**	**6.1**	**583**	**591**	**610**	**525**	**130**	**180**	**291**	**304**	**450**	**436**
pH (su)		**7.5**	**7.4**	**7.3**	**7.1**	**7.1**	**7.0**	**7.2**	**7.3**	**7.4**	**7.3**	**7.5**	**7.4**
TDS (mg/L)		**501**	**524**	**26200**	**26400**	**26800**	**26600**	**6680**	**7160**	**13000**	**12400**	**11200**	**11000**

Notes:

Bold value: Detection above laboratory reporting limit

µS/cm = micro Siemens per centimeter

Deg C = degrees Celsius

ft btoc = feet below top of casing

mg/L = milligrams per liter

NTU = Nephelometric Turbidity Unit

su = standard unit

TDS = total dissolved solids

TOC = top of casing

FIGURE

LEGEND

- MONITORING WELL
- ASH LANDFILL ACTIVE AREA
- LANDFILL DISPOSAL AREA LIMITS

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE, 17 APRIL 2018.

N

0 300 600

SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL MONITORING WELL LOCATION MAP

JANUARY 2020
SCALE: AS SHOWN

FIGURE 1

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

October 7, 2022
Project No. 0204993-000

TO: Evergy Kansas Central, Inc.
Jared Morrison – Director, Water and Waste Programs

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

Mark Nicholls
Digitally signed by Mark Nicholls
Date: 2022.10.07 14:41:27 -07'00'

SUBJECT: 2019 Annual Groundwater Monitoring and Corrective Action Report Addendum
Evergy Kansas Central, Inc.
847 Landfill
Lawrence Energy Center – Lawrence, Kansas

The Evergy Kansas Central, Inc. (Evergy) 847 Landfill at the Lawrence Energy Center is subject to the groundwater monitoring and corrective action requirements described under Code of Federal Regulations Title 40 (40 CFR) §257.90 through §257.98 (Rule). An Annual Groundwater Monitoring and Corrective Action (GWMCA) Report documenting the activities completed in 2019 for the 847 Landfill was completed and placed in the facility's operating record on January 31, 2020, as required by the Rule. The Annual GWMCA Report contained the specific information listed in 40 CFR §257.90(e).

This report 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 should contain:

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

While this information is not specifically referred to in 40 CFR §257.90(e) for inclusion in the GWMCA Report, it has been routinely collected and maintained in Evergy's files and is being provided in the attachments to this addendum. The applicable laboratory analysis reports for 2019 sampling events are included in Attachment 1, and a discussion of the applicable statistical analyses completed in 2019 are included in Attachment 2 of this addendum. For each of the 2019 sampling events, the measured groundwater elevations, with calculated groundwater flow rates and directions, have been included in Attachment 3.

The attachments to this addendum are as follows providing the additional information:

- 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 sampling events completed in March and September 2019 are provided.
- Attachment 2 – Statistical Analyses: Includes a discussion of the statistical analyses utilized along with a table summarizing the statistical outputs (e.g., frequency of detection, maximum detection, variance, standard deviation, coefficient of variance, outlier tests, trends, upper and lower confidence limits, and comparison against Groundwater Protection Standards), and supporting backup for statistical analyses completed in 2019. Statistical analyses completed in 2019 included:
  - Overview of the January 2019 statistical analysis for data obtained in the September 2018 sampling event; and
  - Overview of the July 2019 statistical analysis for data obtained in the March 2019 sampling event.
- Attachment 3 – Groundwater Potentiometric Maps: Includes the measured groundwater elevations at each well and the generalized groundwater flow direction and calculated flow rate. Maps for the sampling events completed in March and September 2019 are provided.

ATTACHMENT 1
Laboratory Analytical Reports

ATTACHMENT 1-1
March 2018 Sampling Event
Laboratory Analytical Report

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

March 27, 2019

Brandon Griffin
Westar Energy
818 S. Kansas Ave
Topeka, KS 66612

RE: Project: LEC LF CCR
Pace Project No.: 60297248

Dear Brandon Griffin:
Enclosed are the analytical results for sample(s) received by the laboratory on March 19, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: HEATH HORYNA, WESTAR ENERGY
Adam Kneeling, Haley & Aldrich, Inc.
JARED MORRISON, WESTAR ENERGY

REPORT OF LABORATORY ANALYSIS

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

CERTIFICATIONS

Project: LEC LF CCR
Pace Project No.: 60297248

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Certification Number: 10090
Arkansas Drinking Water
WY STR Certification #: 2456.01
Arkansas Certification #: 18-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116 / E10426
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Kansas Field Laboratory Accreditation: # E-92587
Missouri Certification: 10070
Missouri Certification Number: 10090

REPORT OF LABORATORY ANALYSIS

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

SAMPLE SUMMARY

Project: LEC LF CCR
Pace Project No.: 60297248

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60297248001	**MW-35-031819**	Water	03/18/19 11:24	03/19/19 15:35
60297248002	**MW-32-031819**	Water	03/18/19 12:25	03/19/19 15:35
60297248003	**MW-31R-031819**	Water	03/18/19 13:40	03/19/19 15:35
60297248004	**MW-33-031819**	Water	03/18/19 14:30	03/19/19 15:35
60297248005	**MW-34-031819**	Water	03/18/19 15:36	03/19/19 15:35
60297248006	**DUP-031819**	Water	03/18/19 06:00	03/19/19 15:35

Pace Analytical Services, LLC
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: LEC LF CCR
Pace Project No.: 60297248

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60297248001	**MW-35-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297248002	**MW-32-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297248003	**MW-31R-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297248004	**MW-33-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297248005	**MW-34-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K
60297248006	**DUP-031819**	EPA 200.7	EMR	2	PASI-K
		SM 2540C	ZMH	1	PASI-K
		SM 4500-H+B	ZMH	1	PASI-K
		EPA 300.0	WNM	3	PASI-K

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

ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: MW-35-031819 **Lab ID: 60297248001** Collected: 03/18/19 11:24 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1960**	ug/L	100	1	03/20/19 15:37	03/22/19 15:46	7440-42-8	
Calcium, Total Recoverable	**521000**	ug/L	200	1	03/20/19 15:37	03/22/19 15:46	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26200**	mg/L	5.0	1		03/21/19 13:16		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		03/21/19 09:50		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**16700**	mg/L	2000	2000		03/27/19 09:11	16887-00-6	M1
Fluoride	**<0.20**	mg/L	0.20	1		03/26/19 14:49	16984-48-8	
Sulfate	**583**	mg/L	50.0	50		03/26/19 16:56	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: MW-32-031819 **Lab ID: 60297248002** Collected: 03/18/19 12:25 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**179**	ug/L	100	1	03/20/19 15:37	03/22/19 15:48	7440-42-8	
Calcium, Total Recoverable	**58400**	ug/L	200	1	03/20/19 15:37	03/22/19 15:48	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**501**	mg/L	5.0	1		03/21/19 13:16		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.5**	Std. Units	0.10	1		03/21/19 09:51		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**106**	mg/L	10.0	10		03/26/19 17:59	16887-00-6	
Fluoride	**0.28**	mg/L	0.20	1		03/26/19 17:43	16984-48-8	
Sulfate	**6.2**	mg/L	1.0	1		03/26/19 17:43	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: MW-31R-031819 **Lab ID: 60297248003** Collected: 03/18/19 13:40 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**553**	ug/L	100	1	03/20/19 15:37	03/22/19 15:50	7440-42-8	
Calcium, Total Recoverable	**212000**	ug/L	200	1	03/20/19 15:37	03/22/19 15:50	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**6680**	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.2**	Std. Units	0.10	1		03/21/19 09:53		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**3980**	mg/L	500	500		03/27/19 09:49	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		03/26/19 18:31	16984-48-8	
Sulfate	**130**	mg/L	10.0	10		03/26/19 18:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: MW-33-031819 **Lab ID: 60297248004** Collected: 03/18/19 14:30 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1620**	ug/L	100	1	03/20/19 15:37	03/22/19 15:53	7440-42-8	
Calcium, Total Recoverable	**252000**	ug/L	200	1	03/20/19 15:37	03/22/19 15:53	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**13000**	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		03/21/19 09:55		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**8290**	mg/L	1000	1000		03/27/19 10:02	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		03/26/19 19:50	16984-48-8	
Sulfate	**291**	mg/L	50.0	50		03/26/19 20:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: MW-34-031819 **Lab ID: 60297248005** Collected: 03/18/19 15:36 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**2110**	ug/L	100	1	03/20/19 15:37	03/22/19 16:00	7440-42-8	
Calcium, Total Recoverable	**211000**	ug/L	200	1	03/20/19 15:37	03/22/19 16:00	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**11200**	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.5**	Std. Units	0.10	1		03/21/19 09:58		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6960**	mg/L	1000	1000		03/27/19 10:41	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		03/26/19 20:38	16984-48-8	
Sulfate	**450**	mg/L	50.0	50		03/26/19 21:09	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC LF CCR
Pace Project No.: 60297248

Sample: DUP-031819 **Lab ID: 60297248006** Collected: 03/18/19 06:00 Received: 03/19/19 15:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1880**	ug/L	500	5	03/20/19 15:37	03/22/19 16:14	7440-42-8	
Calcium, Total Recoverable	**551000**	ug/L	1000	5	03/20/19 15:37	03/22/19 16:14	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26400**	mg/L	5.0	1		03/22/19 15:40		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		03/21/19 09:36		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**15900**	mg/L	2000	2000		03/27/19 10:53	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		03/26/19 21:25	16984-48-8	
Sulfate	**591**	mg/L	50.0	50		03/26/19 21:57	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 574666 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60297248001, 60297248002, 60297248003, 60297248004, 60297248005, 60297248006

METHOD BLANK: 2357040 Matrix: Water
Associated Lab Samples: 60297248001, 60297248002, 60297248003, 60297248004, 60297248005, 60297248006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<100	100	03/22/19 15:32	
Calcium	ug/L	<200	200	03/22/19 15:32	

LABORATORY CONTROL SAMPLE: 2357041

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	952	95	85-115	
Calcium	ug/L	10000	9930	99	85-115	

MATRIX SPIKE SAMPLE: 2357042

Parameter	Units	75104735001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	3420	1000	4370	95	70-130	
Calcium	ug/L	62600	10000	71600	90	70-130	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2357043 2357044

Parameter	Units	75104929001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	1000	1000	2890	2970	283	290	70-130	3	20	M1
Calcium	ug/L	49600	10000	10000	569000	536000	5190	4860	70-130	6	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 574795 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60297248001, 60297248002

METHOD BLANK: 2357675 Matrix: Water
Associated Lab Samples: 60297248001, 60297248002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/21/19 13:16	

LABORATORY CONTROL SAMPLE: 2357676

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	100	80-120	

SAMPLE DUPLICATE: 2357677

Parameter	Units	60296854009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	833	845	1	10	

SAMPLE DUPLICATE: 2357678

Parameter	Units	60296977004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2440	2490	2	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 575162 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60297248003, 60297248004, 60297248005, 60297248006

METHOD BLANK: 2359339 Matrix: Water
Associated Lab Samples: 60297248003, 60297248004, 60297248005, 60297248006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	03/22/19 15:39	

LABORATORY CONTROL SAMPLE: 2359340

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	992	99	80-120	

SAMPLE DUPLICATE: 2359341

Parameter	Units	60297248003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	6680	6630	1	10	

SAMPLE DUPLICATE: 2359342

Parameter	Units	60297249004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4710	4720	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 574786 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60297248001, 60297248002, 60297248003, 60297248004, 60297248005, 60297248006

SAMPLE DUPLICATE: 2357649

Parameter	Units	60296609001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.2	8.3	1	5	H6

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 575578 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60297248001, 60297248002, 60297248003, 60297248004, 60297248005, 60297248006

METHOD BLANK: 2361195 Matrix: Water
Associated Lab Samples: 60297248001, 60297248002, 60297248003, 60297248004, 60297248005, 60297248006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/26/19 14:04	
Fluoride	mg/L	<0.20	0.20	03/26/19 14:04	
Sulfate	mg/L	<1.0	1.0	03/26/19 14:04	

LABORATORY CONTROL SAMPLE: 2361196

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	97	90-110	
Fluoride	mg/L	2.5	2.6	102	90-110	
Sulfate	mg/L	5	5.2	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2361197 2361198

Parameter	Units	60297248001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Sulfate	mg/L	583	250	250	900	844	127	104	90-110	6	15	M1

MATRIX SPIKE SAMPLE: 2361199

Parameter	Units	60297300004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	53.4	50	102	98	90-110	

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC LF CCR
Pace Project No.: 60297248

QC Batch: 575749 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60297248001, 60297248003, 60297248004, 60297248005, 60297248006

METHOD BLANK: 2361871 Matrix: Water
Associated Lab Samples: 60297248001, 60297248003, 60297248004, 60297248005, 60297248006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	03/27/19 08:45	

LABORATORY CONTROL SAMPLE: 2361872

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2361873 2361874

Parameter	Units	60297248001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	16700	10000	10000	25300	25000	86	83	90-110	2	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: LEC LF CCR
Pace Project No.: 60297248

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

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

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC LF CCR
Pace Project No.: 60297248

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60297248001	**MW-35-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248002	**MW-32-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248003	**MW-31R-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248004	**MW-33-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248005	**MW-34-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248006	**DUP-031819**	EPA 200.7	574666	EPA 200.7	574830
60297248001	**MW-35-031819**	SM 2540C	574795		
60297248002	**MW-32-031819**	SM 2540C	574795		
60297248003	**MW-31R-031819**	SM 2540C	575162		
60297248004	**MW-33-031819**	SM 2540C	575162		
60297248005	**MW-34-031819**	SM 2540C	575162		
60297248006	**DUP-031819**	SM 2540C	575162		
60297248001	**MW-35-031819**	SM 4500-H+B	574786		
60297248002	**MW-32-031819**	SM 4500-H+B	574786		
60297248003	**MW-31R-031819**	SM 4500-H+B	574786		
60297248004	**MW-33-031819**	SM 4500-H+B	574786		
60297248005	**MW-34-031819**	SM 4500-H+B	574786		
60297248006	**DUP-031819**	SM 4500-H+B	574786		
60297248001	**MW-35-031819**	EPA 300.0	575578		
60297248001	**MW-35-031819**	EPA 300.0	575749		
60297248002	**MW-32-031819**	EPA 300.0	575578		
60297248003	**MW-31R-031819**	EPA 300.0	575578		
60297248003	**MW-31R-031819**	EPA 300.0	575749		
60297248004	**MW-33-031819**	EPA 300.0	575578		
60297248004	**MW-33-031819**	EPA 300.0	575749		
60297248005	**MW-34-031819**	EPA 300.0	575578		
60297248005	**MW-34-031819**	EPA 300.0	575749		
60297248006	**DUP-031819**	EPA 300.0	575578		
60297248006	**DUP-031819**	EPA 300.0	575749		

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Sample Condition Upon Receipt

WO# : 60297248

60297248

Client Name: Westar Energy

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

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

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

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

Thermometer Used: T-296 **Type of Ice:** Wet ☑ Blue None

Cooler Temperature (°C): **As-read** 2.2 **Corr. Factor** -1.0 **Corrected** 1.2

Date and initials of person examining contents: PW 3/19/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	WESTAR ENERGY	Report To:	Brandon Griffin	Attention:	
Address:	818 Kansas Ave	Copy To:	Jared Morrison	Company Name:	
	Topeka, KS 66612			Address:	
Email To:	brandon.l.griffin@westarenergy.com	Purchase Order No.:	10LEC-0000015648	Pace Quote Reference:	
Phone:	785-575-8135 Fax:	Project Name:	LEC LF CCR	Pace Project Manager:	Heather Wilson 913-563-1407
Requested Due Date/TAT:	7 day	Project Number:		Pace Profile #:	9655, 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 60297248
1	MW-35-031819	WT	G			3/18	1124		2	1		1												BPIN BPIN 001
2	MW-32-031819	WT	G			3/18	1225		2	1		1												002
3	MW-31R-031819	WT	G			3/18	1340		2	1		1												003
4	MW-33-031819	WT	G			3/18	1430		2	1		1												004
5	MW-34-031819	WT	G			3/18	1536		2	1		1												005
6																								
7																								
8																								
9																								
10	DUP-031819	WT	G			3/18	0600		2	1		1												BPIN BPIN 006
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
200.7 Total Metals*: B, Ca	[signature] / Westar	03/19	1345	[signature]	3/19/19	1535	1-2	Y	Y	Y

SAMPLER NAME AND SIGNATURE					
PRINT Name of SAMPLER:	Brandon Griffin		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	[signature]	DATE Signed (MM/DD/YY): 03/18/19				

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

F-ALL-Q-020rev.08, 12-Oct-2007

Pace Container Order #468037

Order By :		Ship To :		Return To:	
Company	WESTAR ENERGY	Company	WESTAR ENERGY	Company	Pace Analytical Kansas
Contact	Griffin, Brandon	Contact	Griffin, Brandon	Contact	Wilson, Heather
Email	brandon.l.griffin@westarenergy.	Email	brandon.l.griffin@westarenergy.	Email	heather.wilson@pacelabs.com
Address	818 S. Kansas Ave	Address	818 S. Kansas Ave	Address	9608 Loiret Blvd.
Address 2		Address 2		Address 2	
City	Topeka	City	Topeka	City	Lenexa
State	KS Zip 66612	State	KS Zip 66612	State	KS Zip 66219
Phone	785-575-8135	Phone	785-575-8135	Phone	1(913)563-1407

Info

Project Name	LEC LF CCR- App III	**Due Date**	02/27/2019	**Profile**	9655	**Quote**	
Project	Wilson, Heather	**Return**		**Carrier**	Most Economical	**Locatio**	KS

Trip Blanks

- [ ] Include Trip Blanks

Bottle

- [ ] Blank
- [X] Pre-Printed No Sample IDs
- [ ] Pre-Printed With Sample IDs

- [ ] Boxed Cases
- [ ] Individually Wrapped
- [ ] Grouped By Sample

Return Shipping

- [X] No Shipper
- [ ] With Shipper

COC Options

- [ ] Number of Blanks
- [X] Pre-Printed 1

Misc

- [ ] Sampling Instructions
- [X] Custody Seal
- [X] Temp. Blanks
- [X] Coolers
- [ ] Syringes

- [ ] Extra Bubble Wrap
- [ ] Short Hold/Rush
- [ ] DI Liter(s)
- [ ] USDA Regulated Soils

# of Samples	Matrix	Test	Container	Total	# of	Lot #	Notes
6	WT	Metals	1-1L plastic w/HNO3	6	0	010719-2AJN	
6	WT	300.0 Anions/pH/TDS	1L plastic unpreserved	6	0	010719-2APJ	

Hazard Shipping Placard In Place : NO

*Sample receiving hours are Mon-Fri 7:00am-6:00pm and Sat 8:00am-2:00pm unless special arrangements are made with your project manager.

*Pace Analytical reserves the right to return hazardous, toxic, or radioactive samples to you.
*Pace Analytical reserves the right to charge for unused bottles, as well as cost associated with sample storage and disposal.
*Payment term are net 30 days.
*Please include the proposal number on the chain of custody to insure proper billing.

Sample

PP COC (1), PP labels w/o sample IDs
Lenexa return
Scott to take on 2/28/19

Ship Date :	02/28/2019
Prepared	robin
Verified By:	

ATTACHMENT 1-2
September 2018 Sampling Event
Laboratory Analytical Report

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

September 17, 2019

Adam Kneeling
Haley & Aldrich, Inc.
400 E. Van Buren St
Suite 545
Phoenix, AZ 85004

RE: Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Dear Adam Kneeling:
Enclosed are the analytical results for sample(s) received by the laboratory on September 06, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Bob Beck, Kansas City Power & Light Company
HEATH HORYNA, WESTAR ENERGY
JARED MORRISON, WESTAR ENERGY
Danielle Zinmaster, Haley & Aldrich

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(913)599-5665

CERTIFICATIONS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212018-1
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-18-11
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60314117001	**MW-34**	Water	09/03/19 15:00	09/06/19 15:20
60314117002	**MW-33**	Water	09/03/19 16:35	09/06/19 15:20
60314117003	**MW-31R**	Water	09/03/19 17:53	09/06/19 15:20
60314117004	**MW-35**	Water	09/04/19 11:05	09/06/19 15:20
60314117005	**MW-32**	Water	09/04/19 12:23	09/06/19 15:20
60314117006	**DUPLICATE**	Water	09/04/19 11:05	09/06/19 15:20

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SAMPLE ANALYTE COUNT

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60314117001	**MW-34**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60314117002	**MW-33**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60314117003	**MW-31R**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60314117004	**MW-35**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MGS, MJK	3	PASI-K
60314117005	**MW-32**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MJK	3	PASI-K
60314117006	**DUPLICATE**	EPA 200.7	JDE	2	PASI-K
		SM 2540C	BLA	1	PASI-K
		SM 4500-H+B	AJS2	1	PASI-K
		EPA 300.0	MGS	3	PASI-K

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: MW-34 **Lab ID: 60314117001** Collected: 09/03/19 15:00 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1810**	ug/L	100	1	09/10/19 16:39	09/11/19 11:13	7440-42-8	
Calcium, Total Recoverable	**195000**	ug/L	200	1	09/10/19 16:39	09/11/19 11:13	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**11000**	mg/L	333	1		09/10/19 13:00		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		09/10/19 10:35		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**6330**	mg/L	500	500		09/12/19 15:10	16887-00-6	
Fluoride	**1.2**	mg/L	0.20	1		09/12/19 01:09	16984-48-8	
Sulfate	**436**	mg/L	100	100		09/12/19 00:10	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: MW-33 **Lab ID: 60314117002** Collected: 09/03/19 16:35 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1390**	ug/L	100	1	09/10/19 16:39	09/11/19 11:20	7440-42-8	
Calcium, Total Recoverable	**224000**	ug/L	200	1	09/10/19 16:39	09/11/19 11:20	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**12400**	mg/L	500	1		09/10/19 13:01		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		09/10/19 10:38		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**7300**	mg/L	1000	1000		09/12/19 15:58	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		09/12/19 01:24	16984-48-8	
Sulfate	**304**	mg/L	100	100		09/12/19 01:54	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: MW-31R **Lab ID: 60314117003** Collected: 09/03/19 17:53 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**523**	ug/L	100	1	09/10/19 16:39	09/11/19 11:23	7440-42-8	
Calcium, Total Recoverable	**198000**	ug/L	200	1	09/10/19 16:39	09/11/19 11:23	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**7160**	mg/L	200	1		09/10/19 13:01		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.3**	Std. Units	0.10	1		09/10/19 10:40		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**3530**	mg/L	500	500		09/16/19 11:41	16887-00-6	
Fluoride	**0.31**	mg/L	0.20	1		09/12/19 02:09	16984-48-8	
Sulfate	**180**	mg/L	20.0	20		09/12/19 02:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: MW-35 **Lab ID: 60314117004** Collected: 09/04/19 11:05 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1610**	ug/L	100	1	09/10/19 16:39	09/11/19 11:25	7440-42-8	
Calcium, Total Recoverable	**461000**	ug/L	200	1	09/10/19 16:39	09/11/19 11:25	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26800**	mg/L	1000	1		09/10/19 13:03		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.1**	Std. Units	0.10	1		09/10/19 10:41		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**13900**	mg/L	1000	1000		09/12/19 16:30	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		09/12/19 04:22	16984-48-8	M1
Sulfate	**610**	mg/L	100	100		09/12/19 02:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: MW-32 **Lab ID: 60314117005** Collected: 09/04/19 12:23 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**172**	ug/L	100	1	09/10/19 16:39	09/11/19 11:27	7440-42-8	
Calcium, Total Recoverable	**56300**	ug/L	200	1	09/10/19 16:39	09/11/19 11:27	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**524**	mg/L	10.0	1		09/10/19 13:03		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.4**	Std. Units	0.10	1		09/10/19 10:42		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**113**	mg/L	20.0	20		09/11/19 18:16	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		09/11/19 18:00	16984-48-8	
Sulfate	**6.1**	mg/L	1.0	1		09/11/19 18:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Sample: DUPLICATE **Lab ID: 60314117006** Collected: 09/04/19 11:05 Received: 09/06/19 15:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total	Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Boron, Total Recoverable	**1640**	ug/L	100	1	09/10/19 16:39	09/11/19 11:30	7440-42-8	
Calcium, Total Recoverable	**471000**	ug/L	200	1	09/10/19 16:39	09/11/19 11:30	7440-70-2	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**26600**	mg/L	1000	1		09/10/19 13:03		
4500H+ pH, Electrometric	Analytical Method: SM 4500-H+B							
pH at 25 Degrees C	**7.0**	Std. Units	0.10	1		09/10/19 10:44		H6
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0							
Chloride	**14200**	mg/L	1000	1000		09/13/19 12:32	16887-00-6	
Fluoride	**<0.20**	mg/L	0.20	1		09/12/19 15:29	16984-48-8	M1
Sulfate	**525**	mg/L	100	100		09/12/19 17:28	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608466 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 Metals, Total
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004, 60314117005, 60314117006

METHOD BLANK: 2485612 Matrix: Water
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004, 60314117005, 60314117006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	<100	100	09/11/19 10:55	
Calcium	ug/L	<200	200	09/11/19 10:55	

LABORATORY CONTROL SAMPLE: 2485613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1020	102	85-115	
Calcium	ug/L	10000	10500	105	85-115	

MATRIX SPIKE SAMPLE: 2485614

Parameter	Units	60314116006 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	2260	1000	3120	86	70-130	
Calcium	ug/L	545000	10000	537000	-80	70-130	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2485615 2485616

Parameter	Units	60314218001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	0.37 mg/L	1000	1000	1370	1320	101	95	70-130	4	20	
Calcium	ug/L	151 mg/L	10000	10000	161000	156000	100	48	70-130	3	20	M1

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

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608257 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004, 60314117005, 60314117006

METHOD BLANK: 2484941 Matrix: Water
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004, 60314117005, 60314117006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	<5.0	5.0	09/10/19 13:00	

LABORATORY CONTROL SAMPLE: 2484942

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	995	100	80-120	

SAMPLE DUPLICATE: 2484943

Parameter	Units	60314117001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	11000	10700	2	10	

SAMPLE DUPLICATE: 2484944

Parameter	Units	60314116001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3160	3120	1	10	

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608287 Analysis Method: SM 4500-H+B
QC Batch Method: SM 4500-H+B Analysis Description: 4500H+B pH
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004, 60314117005, 60314117006

SAMPLE DUPLICATE: 2485035

Parameter	Units	60313981001 Result	Dup Result	RPD	Max RPD	Qualifiers
pH at 25 Degrees C	Std. Units	8.4	8.5	2	5	H6

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

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608675 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004

METHOD BLANK: 2486554 Matrix: Water
Associated Lab Samples: 60314117001, 60314117002, 60314117003, 60314117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	09/11/19 12:24	
Sulfate	mg/L	<1.0	1.0	09/11/19 12:24	

LABORATORY CONTROL SAMPLE: 2486555

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2486556 2486557

Parameter	Units	60314116001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	<0.20	2.5	2.5	1.3	1.4	52	56	80-120	8	15	M1
Sulfate	mg/L	1650	500	500	2200	2150	110	100	80-120	2	15	E

MATRIX SPIKE SAMPLE: 2486558

Parameter	Units	60314117004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	<0.20	2.5	<0.20	0	80-120	M1
Sulfate	mg/L	610	500	1130	104	80-120	

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608705 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117006

METHOD BLANK: 2486640 Matrix: Water
Associated Lab Samples: 60314117006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Fluoride	mg/L	<0.20	0.20	09/12/19 10:08	
Sulfate	mg/L	<1.0	1.0	09/12/19 10:08	

LABORATORY CONTROL SAMPLE: 2486643

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

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2486644 2486645

Parameter	Units	60314117006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	<0.20	2.5	2.5	<0.20	<0.20	0	0	80-120		15	M1
Sulfate	mg/L	525	500	500	1100	1120	116	120	80-120	2	15	

MATRIX SPIKE SAMPLE: 2486646

Parameter	Units	60314138010 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	ND	125	134	107	80-120	
Sulfate	mg/L	ND	250	282	99	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608814
QC Batch Method: EPA 300.0
Analysis Method: EPA 300.0
Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117005

METHOD BLANK: 2486917 Matrix: Water
Associated Lab Samples: 60314117005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/11/19 12:25	
Fluoride	mg/L	<0.20	0.20	09/11/19 12:25	
Sulfate	mg/L	<1.0	1.0	09/11/19 12:25	

LABORATORY CONTROL SAMPLE: 2486918

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	101	90-110	
Fluoride	mg/L	2.5	2.6	103	90-110	
Sulfate	mg/L	5	4.9	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2486919 2486920

Parameter	Units	60313018002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	87.1	50	50	137	137	100	99	80-120	0	15	
Fluoride	mg/L	0.43	2.5	2.5	3.1	3.2	108	112	80-120	3	15	
Sulfate	mg/L	277	250	250	529	530	101	101	80-120	0	15	

MATRIX SPIKE SAMPLE: 2486921

Parameter	Units	60313018004 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	4.1	5	9.1	101	80-120	
Fluoride	mg/L	0.51	2.5	3.3	110	80-120	
Sulfate	mg/L	59.5	25	86.0	106	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 608942 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117001, 60314117002, 60314117004

METHOD BLANK: 2487470 Matrix: Water
Associated Lab Samples: 60314117001, 60314117002, 60314117004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/12/19 10:12	

LABORATORY CONTROL SAMPLE: 2487471

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2487472 2487473

Parameter	Units	60314116004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.6	25	25	61.7	61.4	112	111	80-120	1	15	

MATRIX SPIKE SAMPLE: 2487474

Parameter	Units	60314218003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	41.9	25	74.7	131	80-120	M1

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 609189 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117006

METHOD BLANK: 2488509 Matrix: Water
Associated Lab Samples: 60314117006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/13/19 10:47	

LABORATORY CONTROL SAMPLE: 2488510

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	

MATRIX SPIKE SAMPLE: 2488514

Parameter	Units	60314138016 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	61.0	50	132	142	80-120	M1

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

REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

QC Batch: 609549 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60314117003

METHOD BLANK: 2490379 Matrix: Water
Associated Lab Samples: 60314117003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	<1.0	1.0	09/16/19 10:26	

LABORATORY CONTROL SAMPLE: 2490380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2490381 2490382

Parameter	Units	60314117003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	3530	2500	2500	6180	6170	106	106	80-120	0	15	

MATRIX SPIKE SAMPLE: 2490383

Parameter	Units	20120448003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	1150	500	1690	109	80-120	

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REPORT OF LABORATORY ANALYSIS

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

QUALIFIERS

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
H6	Analysis initiated outside of the 15 minute EPA required holding time.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: LEC 847 LANDFILL CCR
Pace Project No.: 60314117

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60314117001	**MW-34**	EPA 200.7	608466	EPA 200.7	608606
60314117002	**MW-33**	EPA 200.7	608466	EPA 200.7	608606
60314117003	**MW-31R**	EPA 200.7	608466	EPA 200.7	608606
60314117004	**MW-35**	EPA 200.7	608466	EPA 200.7	608606
60314117005	**MW-32**	EPA 200.7	608466	EPA 200.7	608606
60314117006	**DUPLICATE**	EPA 200.7	608466	EPA 200.7	608606
60314117001	**MW-34**	SM 2540C	608257		
60314117002	**MW-33**	SM 2540C	608257		
60314117003	**MW-31R**	SM 2540C	608257		
60314117004	**MW-35**	SM 2540C	608257		
60314117005	**MW-32**	SM 2540C	608257		
60314117006	**DUPLICATE**	SM 2540C	608257		
60314117001	**MW-34**	SM 4500-H+B	608287		
60314117002	**MW-33**	SM 4500-H+B	608287		
60314117003	**MW-31R**	SM 4500-H+B	608287		
60314117004	**MW-35**	SM 4500-H+B	608287		
60314117005	**MW-32**	SM 4500-H+B	608287		
60314117006	**DUPLICATE**	SM 4500-H+B	608287		
60314117001	**MW-34**	EPA 300.0	608675		
60314117001	**MW-34**	EPA 300.0	608942		
60314117002	**MW-33**	EPA 300.0	608675		
60314117002	**MW-33**	EPA 300.0	608942		
60314117003	**MW-31R**	EPA 300.0	608675		
60314117003	**MW-31R**	EPA 300.0	609549		
60314117004	**MW-35**	EPA 300.0	608675		
60314117004	**MW-35**	EPA 300.0	608942		
60314117005	**MW-32**	EPA 300.0	608814		
60314117006	**DUPLICATE**	EPA 300.0	608705		
60314117006	**DUPLICATE**	EPA 300.0	609189		

REPORT OF LABORATORY ANALYSIS

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt

WO#: 60314117

60314117

Client Name: Wester

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

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

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

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

Thermometer Used: T-301 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 0.3, 6.0 **Corr. Factor** 0.0 **Corrected** 0.3, 6.0

Date and initials of person examining contents: 9/7/19

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	WESTAR ENERGY
Address:	818 Kansas Ave
	Topeka, KS 66612
Email To:	brandon.l.griffin@westarenergy.com
Phone: 785-575-8135	Fax:
Requested Due Date/TAT:	7 day

Section B Required Project Information:

Report To:	Adam Kneeling
Copy To:	Jared Morrison
Purchase Order No.:	10LEC-0000015648
Project Name:	LEC 847 Landfill CCR
Project Number:	

Section C Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote Reference:	
Pace Project Manager:	Heather Wilson 913-563-1407
Pace Profile #:	9655, 2

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: KS

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	200.7 Total Metals*	300: Cl, F, SO4	2540C TDS	4500 H+B	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-31	WT	G			9/3/19	1500		3	2		1						X	X	X	X		001
2	MW-33	WT	G			9/3/19	1635		3	2		1						X	X	X	X		002
3	MW-31R	WT	G			9/3/19	1753		3	2		1						X	X	X	X		003
4	MW-35	WT	G			9/4/19	1105		3	2		1						X	X	X	X		004
5	MW-32	WT	G			9/4/19	1223		3	2		1						X	X	X	X		005
6	Duplicate	WT	G			9/4/19	1105		3	2		1						X	X	X	X		006
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
200.7 Total Metals*: B, Ca	Misha Miller-Gilmore / H+A	9/6/19	1300	Victor Brown Pace	9/6/19	1520	0.3 / 6.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Misha Miller-Gilmore

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 9/6/19

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

F-ALL-Q-020rev.08, 12-Oct-2007

ATTACHMENT 2
Statistical Analysis

ATTACHMENT 2-1
September 2018 Statistical Analysis

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

TECHNICAL MEMORANDUM

October 7, 2022
File No. 129778-049

TO: Evergy Kansas Central, Inc.
Jared Morrison – Director, Water and Waste Programs

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

SUBJECT: September 2018 Semi-Annual Groundwater Detection Monitoring Data Statistical Evaluation
Completed January 15, 2019
Lawrence Energy Center
847 Landfill

Pursuant to Code of Federal Regulations Title 40 (40 CFR) §§ 257.93 and 257.94 (Rule), this memorandum summarizes the statistical evaluation of the analytical results for the **September 2018** semi-annual detection monitoring groundwater sampling event for the Lawrence Energy Center (LEC) 847 Landfill. This semi-annual detection monitoring groundwater sampling event was completed on **September 4, 2018**, with laboratory results received and accepted on **October 17, 2018**.

The statistical evaluation discussed in this memorandum was conducted to determine if Appendix III groundwater monitoring constituents have been detected in downgradient wells at concentrations that represent a statistically significant increase (SSI) above background or upgradient wells consistent with the requirements in 40 CFR § 257.94.

Statistical Evaluation of Appendix III Constituents

The Rule provides four specific options for statistical evaluation of groundwater quality data collected at a coal combustion residual (CCR) unit (40 CFR § 257.93(f)(1-4)). The two statistical methods used for these evaluations, prediction limits (PLs) and Parametric Analysis of Variance, were certified by Haley & Aldrich, Inc. on January 15, 2018. The PL method, as determined applicable for this sampling event, was used to evaluate potential SSIs above background. Background levels for each constituent listed in Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids) were computed as upper prediction limits (UPLs), considering one future observation, and a minimum 95 percent confidence coefficient. The most recent groundwater sampling event from each compliance well was compared to the corresponding background PL to determine if an SSI existed.

STATISTICAL ANALYSIS

Either an interwell or intrawell evaluation was used to complete the statistical evaluation of the referenced data set. Interwell evaluation compares the most recent values from downgradient compliance wells against a background dataset composed of upgradient well data (MW-32 and MW-35), and the intrawell evaluation compares the most recent values from each compliance well against a background dataset composed of its own historical data.

A PL procedure is one in which a concentration limit for each constituent is established from the distribution of the background data, with a specified confidence level (e.g., 95 percent). The upper endpoint of a concentration limit is called the UPL. Depending on the background data distribution, parametric or non-parametric PL procedures are used to evaluate groundwater monitoring data using this method. Parametric PLs utilize normally distributed data or normalized data via a transformation of the sample background data used to construct the limit. If the data are non-normal and a transformation is not indicated, non-parametric procedures (order statistics or bootstrap methods) are used to calculate the PL. If all the background data are non-detect, a maximum reporting limit may serve as an appropriate UPL.

The statistical evaluation was conducted using the background dataset for all Appendix III constituents. The UPLs were calculated from the background well dataset using Chemstat software after testing for outlier sample results that would warrant removal from the dataset based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using Chemstat and U.S. Environmental Protection Agency's ProUCL 5.1 software, and a visual inspection of the data was performed using box plots and distribution plots for the downgradient sample data. No sample data were identified as outliers that warranted removal from the dataset.

BACKGROUND DISTRIBUTIONS

The groundwater analytical results for each sampling event from the background sample locations MW-32 and MW-35 (for interwell evaluation) were combined to calculate the UPL for each Appendix III constituent. The variability and distribution of the pooled dataset were evaluated to determine the method for UPL calculation. Per the document, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009*, background concentrations were updated based on statistical evaluation of analytical results collected through **September 2018 (interwell evaluation) and June 2017 (intrawell evaluation).**

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations from the downgradient wells for each of the Appendix III constituents from the September 2018 semi-annual detection monitoring sampling event were compared to their respective background PLs (Table I). A sample concentration greater than the background UPL is considered to represent an SSI. Based on previous compliance sampling events, statistical evaluations, and associated alternative source demonstrations, an intrawell comparison is utilized for MW-34 for boron and fluoride statistical evaluations. Interwell comparisons are being utilized for all other well and

constituent evaluations. The results of the groundwater assessment monitoring statistical evaluation are provided in Table I. **Based on this statistical evaluation of groundwater sampling data collected in September 2018, no SSIs above background PLs occurred at the LEC 847 Landfill.**

Enclosures:
Table I – Summary of Semi-Annual Detection Groundwater Monitoring Statistical Analysis Evaluation

TABLE

TABLE I
SUMMARY OF SEMI-ANNUAL DETECTION GROUNDWATER MONITORING STATISTICAL EVALUATION
SEPTEMBER 2018 SAMPLING EVENT
LAWRENCE ENERGY CENTER - 847 LANDFILL
LAWRENCE, KANSAS

													Inter-well Analysis		Intra-well Analysis	
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**Outlier Presence**	**Outlier Removed**	**Trend**	**Distribution Well**	**September 2018 Concentration (mg/L)**	**Background Limits[1] (UPL) mg/L**	**SSI**	**Background Limit[2] (UPL) mg/L**	**SSI**
CCR Appendix-III: Boron, Total (mg/L)																
MW-32	10/10	0%	-	0.19	0.00003218	0.005673	0.03131	No	No	Stable			2.05			
MW-35	10/10	0%	-	2.05	0.02181	0.1477	0.08091	No	No	Stable						
MW-31R	10/10	0%	-	0.71	0.003722	0.06101	0.09521	Yes	No	Stable	Normal	0.538		N		
MW-33	10/10	0%	-	1.7	0.00704	0.0839	0.05091	No	No	Stable	Non-parametric	1.68		N		
MW-34	10/10	0%	-	2.13	0.01738	0.1318	0.06615	Yes	No	Increasing	Normal	2.13			2.56	N
CCR Appendix-III: Calcium, Total (mg/L)																
MW-32	10/10	0%	-	61.9	3.141	1.772	0.02991	No	No	Stable			545			
MW-35	10/10	0%	-	545	1708	41.33	0.08062	No	No	Stable						
MW-31R	10/10	0%	-	248	208.8	14.45	0.06475	No	No	Stable	Normal	213		N		
MW-33	10/10	0%	-	265	75.57	8.693	0.03445	No	No	Stable	Normal	242		N		
MW-34	10/10	0%	-	243	147.7	12.15	0.05398	No	No	Stable	Normal	205		N		
CCR Appendix-III: Chloride, Total (mg/L)																
MW-32	10/10	0%	-	103	18.1	4.255	0.0442	No	No	Stable			14900			
MW-35	10/10	0%	-	14900	1102000	1050	0.07541	No	No	Stable						
MW-31R	9/10	10%	1-1	5210	1921000	1386	0.3691	Yes	No	Stable	Non-parametric	3550		N		
MW-33	10/10	0%	-	8700	319500	565.2	0.07565	Yes	No	Stable	Normal	6810		N		
MW-34	10/10	0%	-	6790	139100	373	0.06053	No	No	Stable	Normal	6060		N		
CCR Appendix-III: Fluoride, Total (mg/L)																
MW-32	8/10	20%	0.2-0.2	0.31	0.00109	0.03302	0.1417	No	No	Stable			1.70			
MW-35	2/10	80%	0.1-10	1.6	9.482	3.079	2.2	Yes	No	NA						
MW-31R	8/10	20%	0.2-0.2	0.73	0.03448	0.1857	0.3853	No	No	Stable	Normal	0.45		N		
MW-33	6/10	40%	0.2-4	1.4	1.236	1.112	0.9444	Yes	No	Stable	Non-parametric	1.5		N		
MW-34	8/10	20%	0.2-10	1.9	7.652	2.766	1.229	Yes	No	Stable	Non-parametric	1.9			3.85	N
CCR Appendix-III: pH (lab), Total (SU)																
MW-32	10/10	0%	-	7.9	0.02544	0.1595	0.02102	No	No	Stable			8.3			
MW-35	10/10	0%	-	7.4	0.008444	0.09189	0.0128	No	No	Stable						
MW-31R	10/10	0%	-	7.5	0.01156	0.1075	0.01465	Yes	No	Stable	Normal	7.3		N		
MW-33	10/10	0%	-	7.6	0.005	0.07071	0.009491	Yes	No	Stable	Non-parametric	7.4		N		
MW-34	10/10	0%	-	7.9	0.01733	0.1317	0.01714	No	No	Stable	Normal	7.6		N		
CCR Appendix-III: Sulfate, Total (mg/L)																
MW-32	10/10	0%	-	9.1	0.8307	0.9114	0.1228	No	No	Decreasing			666			
MW-35	10/10	0%	-	666	605.8	24.61	0.03934	No	No	Stable						
MW-31R	10/10	0%	-	175	488.3	22.1	0.1534	No	No	Stable	Normal	117		N		
MW-33	10/10	0%	-	462	3308	57.51	0.1757	Yes	No	Stable	Normal	289		N		
MW-34	10/10	0%	-	517	1656	40.69	0.08758	No	No	Stable	Normal	438		N		

TABLE I
SUMMARY OF SEMI-ANNUAL DETECTION GROUNDWATER MONITORING STATISTICAL EVALUATION
SEPTEMBER 2018 SAMPLING EVENT
LAWRENCE ENERGY CENTER - 847 LANDFILL
LAWRENCE, KANSAS

													Inter-well Analysis		Intra-well Analysis	
Location Id	Frequency of Detection	Percent Non-Detects	Range of Non-Detect	Maximum Detect	Variance	Standard Deviation	Coefficient of Variance	Outlier Presence	Outlier Removed	Trend	Distribution Well	September 2018 Concentration (mg/L)	Background Limits[1] (UPL) mg/L	SSI	Background Limit[2] (UPL) mg/L	SSI
CCR Appendix-III: Total Dissolved Solids (mg/L)																
MW-32	10/10	0%	-	525	279.6	16.72	0.03417	No	No	Stable			27100			
MW-35	10/10	0%	-	27100	56120000	7492	0.3334	No	No	Stable						
MW-31R	10/10	0%	-	8200	827900	909.9	0.1266	No	No	Stable	Normal	6520		N		
MW-33	10/10	0%	-	14100	1847000	1359	0.1092	No	No	Stable	Normal	14100		N		
MW-34	10/10	0%	-	12300	7573000	2752	0.2646	Yes	No	Stable	Non-parametric	12200		N		

Notes and Abbreviations:

[1] Interwell background data collected from 08/16/2016 through 09/04/2018, unless otherwise noted.

[2] Intrawell background data collected from 08/16/2016 through 06/26/2017.

CCR = coal combustion residual

mg/L = milligrams per Liter

SSI = statistically significant increase

SU = standard unit

UPL = upper prediction limit

ATTACHMENT 2-2
March 2019 Statistical Analysis

HALEY & ALDRICH, INC.
6500 Rockside Road
Suite 200
Cleveland, OH 44131
216.739.0555

TECHNICAL MEMORANDUM

October 7, 2022
File No. 129778-049

TO: Evergy Kansas Central, Inc.
Jared Morrison – Director, Water and Waste Programs

FROM: Haley & Aldrich, Inc.
Steven F. Putrich, P.E., Principal Consultant – Engineering Principal
Mark Nicholls, P.G., Senior Associate – Senior Hydrogeologist

SUBJECT: March 2019 Semi-Annual Groundwater Detection Monitoring Data
Statistical Evaluation
Completed July 15, 2019
Lawrence Energy Center
847 Landfill

Pursuant to Code of Federal Regulations Title 40 (40 CFR) §§ 257.93 and 257.94 (Rule), this memorandum summarizes the statistical evaluation of the analytical results for the **March 2019** semi-annual detection monitoring groundwater sampling event for the Lawrence Energy Center (LEC) 847 Landfill. This semi-annual detection monitoring groundwater sampling event was completed on **March 27, 2019**, with laboratory results received and accepted on **April 15, 2019**.

The statistical evaluation discussed in this memorandum was conducted to determine if Appendix III groundwater monitoring constituents have been detected in downgradient wells at concentrations that represent a statistically significant increase (SSI) above background or upgradient wells consistent with the requirements in 40 CFR § 257.94.

Statistical Evaluation of Appendix III Constituents

The Rule provides four specific options for statistical evaluation of groundwater quality data collected at the coal combustion residual (CCR) unit (40 CFR § 257.93(f)(1-4)). One statistical method used for these evaluations, the prediction limit (PL) method, was certified by Haley & Aldrich, Inc. on April 17, 2019. The PL method, as determined applicable for this sampling event, was used to evaluate potential SSIs above background. Background levels for each constituent listed in Appendix III (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids) were computed as upper prediction limits (UPLs), considering one future observation, and a minimum 95 percent confidence coefficient. The most recent groundwater sampling event from each compliance well was compared to the corresponding background PL to determine if an SSI existed.

STATISTICAL EVALUATION

Either an interwell or intrawell evaluation was used to complete the statistical evaluation of the referenced data set. Interwell evaluation compares the most recent values from downgradient compliance wells against a background dataset composed of upgradient well data (MW-32 and MW-35), and the intrawell evaluation compares the most recent values from each compliance well against a background dataset composed of its own historical data.

A PL procedure is one in which a concentration limit for each constituent is established from the distribution of the background data, with a specified confidence level (e.g., 95 percent). The upper endpoint of a concentration limit is called the UPL. Depending on the background data distribution, parametric or non-parametric PL procedures are used to evaluate groundwater monitoring data using this method. Parametric PLs utilize normally distributed data or normalized data via a transformation of the sample background data used to construct the limit. If the data are non-normal and a transformation is not indicated, non-parametric procedures (order statistics or bootstrap methods) are used to calculate the PL. If all the background data are non-detect, a maximum reporting limit may serve as an appropriate UPL.

The statistical evaluation was conducted using the background dataset for all Appendix III constituents. The UPLs were calculated from the background well dataset using Chemstat software after testing for outlier sample results that would warrant removal from the dataset based on likely error in sampling or measurement. Both visual and statistical outlier tests for the background data were performed using Chemstat and U.S. Environmental Protection Agency's ProUCL 5.1 software, and a visual inspection of the data was performed using box plots and distribution plots for the downgradient sample data. No sample data were identified as outliers that warranted removal from the dataset.

BACKGROUND DISTRIBUTIONS

The groundwater analytical results for each sampling event from the background sample locations MW-32 and MW-35 (for interwell evaluation) were combined to calculate the UPL for each Appendix III constituent. The variability and distribution of the pooled dataset were evaluated to determine the method for UPL calculation. Per the document, *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, March 2009*, background concentrations were updated based on statistical evaluation of analytical results collected through **September 2018 (interwell evaluation) and June 2017 (intrawell evaluation).**

RESULTS OF APPENDIX III DOWNGRADIENT STATISTICAL COMPARISONS

The sample concentrations from the downgradient wells for each of the Appendix III constituents from the March 2019 semi-annual detection monitoring sampling event were compared to their respective background PLs (Table I). A sample concentration greater than the background UPL is considered to represent an SSI. Based on previous compliance sampling events, statistical evaluations, and associated alternative source demonstrations, an intrawell comparison is utilized for MW-34 for boron and fluoride statistical evaluations. Interwell comparisons are being utilized for all other well and constituent

evaluations. The results of the groundwater assessment monitoring statistical evaluation are provided in Table I. **Based on this statistical evaluation of groundwater sampling data collected in March 2019, no SSIs above background PLs occurred at the LEC 847 Landfill.**

Enclosures:
Table I – Summary of Semi-Annual Detection Groundwater Monitoring Statistical Analysis Evaluation

TABLE

TABLE I
SUMMARY OF SEMI-ANNUAL DETECTION GROUNDWATER MONITORING STATISTICAL EVALUATION
MARCH 2019 SAMPLING EVENT
LAWRENCE ENERGY CENTER - 847 LANDFILL
LAWRENCE, KANSAS

													Inter-well Analysis		Intra-well Analysis	
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**Outlier Presence**	**Outlier Removed**	**Trend**	**Distribution Well**	**March 2019 Concentration (mg/L)**	**Background Limits[1] (UPL) mg/L**	**SSI**	**Background Limit[2] (UPL) mg/L**	**SSI**
	CCR Appendix-III: Boron, Total (mg/L)															
MW-32	11/11	0%	-	0.19	0.00003218	0.005673	0.03131	No	No	Stable			2.05			
MW-35	11/11	0%	-	2.05	0.02181	0.1477	0.08091	Yes	No	Stable						
MW-31R	11/11	0%	-	0.71	0.003722	0.06101	0.09521	Yes	No	Stable	Normal	0.553		N		
MW-33	11/11	0%	-	1.7	0.00704	0.0839	0.05091	No	No	Stable	Non-parametric	1.62		N		
MW-34	11/11	0%	-	2.13	0.01738	0.1318	0.06615	Yes	No	Increasing	Normal	2.11			2.56	N
	CCR Appendix-III: Calcium, Total (mg/L)															
MW-32	11/11	0%	-	61.9	3.141	1.772	0.02991	No	No	Stable			545			
MW-35	11/11	0%	-	545	1708	41.33	0.08062	Yes	No	Stable						
MW-31R	11/11	0%	-	248	208.8	14.45	0.06475	No	No	Stable	Normal	212		N		
MW-33	11/11	0%	-	265	75.57	8.693	0.03445	No	No	Stable	Normal	252		N		
MW-34	11/11	0%	-	243	147.7	12.15	0.05398	No	No	Stable	Normal	211		N		
	CCR Appendix-III: Chloride, Total (mg/L)															
MW-32	11/11	0%	-	103	18.1	4.255	0.0442	No	No	Stable			14,900			
MW-35	11/11	0%	-	14,900	1,102,000	1,050	0.07541	No	No	Stable						
MW-31R	10/11	10%	1-1	5,210	1,921,000	1,386	0.3691	Yes	No	Stable	Non-parametric	3980		N		
MW-33	11/11	0%	-	8,700	319,500	565.2	0.07565	Yes	No	Stable	Normal	8290		N		
MW-34	11/11	0%	-	6,790	139,100	373	0.06053	No	No	Stable	Normal	6960		N		
	CCR Appendix-III: Fluoride, Total (mg/L)															
MW-32	9/11	20%	0.2-0.2	0.31	0.00109	0.03302	0.1417	No	No	Stable			1.70			
MW-35	3/11	80%	0.1-10	1.6	9.482	3.079	2.2	Yes	No	Stable						
MW-31R	9/11	20%	0.2-0.2	0.73	0.03448	0.1857	0.3853	No	No	Stable	Normal	<0.20		N		
MW-33	7/11	40%	0.2-4	1.4	1.236	1.112	0.9444	Yes	No	Stable	Non-parametric	<0.20		N		
MW-34	9/11	20%	0.2-10	1.9	7.652	2.766	1.229	Yes	No	Stable	Non-parametric	<0.20			3.85	N
	CCR Appendix-III: pH (lab), Total (SU)															
MW-32	11/11	0%	-	7.9	0.02544	0.1595	0.02102	Yes	No	Stable			8.26			
MW-35	11/11	0%	-	7.4	0.008444	0.09189	0.0128	Yes	No	Stable						
MW-31R	11/11	0%	-	7.5	0.01156	0.1075	0.01465	Yes	No	Stable	Normal	7.2		N		
MW-33	11/11	0%	-	7.6	0.005	0.07071	0.009491	Yes	No	Stable	Non-parametric	7.4		N		
MW-34	11/11	0%	-	7.9	0.01733	0.1317	0.01714	No	No	Stable	Normal	7.5		N		
	CCR Appendix-III: Sulfate, Total (mg/L)															
MW-32	11/11	0%	-	9.1	0.8307	0.9114	0.1228	No	No	Decreasing			666			
MW-35	11/11	0%	-	666	605.8	24.61	0.03934	No	No	Stable						
MW-31R	11/11	0%	-	175	488.3	22.1	0.1534	No	No	Stable	Normal	130		N		
MW-33	11/11	0%	-	462	3308	57.51	0.1757	Yes	No	Stable	Normal	291		N		
MW-34	11/11	0%	-	517	1656	40.69	0.08758	No	No	Stable	Normal	450		N		

TABLE I
SUMMARY OF SEMI-ANNUAL DETECTION GROUNDWATER MONITORING STATISTICAL EVALUATION
MARCH 2019 SAMPLING EVENT
LAWRENCE ENERGY CENTER - 847 LANDFILL
LAWRENCE, KANSAS

													Inter-well Analysis		Intra-well Analysis	
Location Id	**Frequency of Detection**	**Percent Non-Detects**	**Range of Non-Detect**	**Maximum Detect**	**Variance**	**Standard Deviation**	**Coefficient of Variance**	**Outlier Presence**	**Outlier Removed**	**Trend**	**Distribution Well**	**March 2019 Concentration (mg/L)**	**Background Limits[1] (UPL) mg/L**	**SSI**	**Background Limit[2] (UPL) mg/L**	**SSI**
	CCR Appendix-III: Total Dissolved Solids (TDS) (mg/L)															
MW-32	11/11	0%	-	525	279.6	16.72	0.03417	No	No	Stable			27,100			
MW-35	11/11	0%	-	27,100	56,120,000	7,492	0.3334	Yes	No	Stable						
MW-31R	11/11	0%	-	8,200	827,900	909.9	0.1266	No	No	Stable		6680		N		
MW-33	11/11	0%	-	14,100	1,847,000	1,359	0.1092	No	No	Stable	Normal	13000		N		
MW-34	11/11	0%	-	12,300	7,573,000	2,752	0.2646	Yes	No	Stable	Non-parametric	11200		N		

Notes and Abbreviations:

[1] Interwell background data collected from 08/16/2016 through 09/04/2018, unless otherwise noted.

[2] Intrawell background data collected from 08/16/2016 through 06/26/2017.

CCR = coal combustion residual

mg/L = milligrams per Liter

SSI = statistically significant increase

SU = standard unit

UPL = upper prediction limit

ATTACHMENT 3
Groundwater Potentiometric Maps

LEGEND

MW-L 815.26	WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), MARCH 2019
	MONITORING WELL
	WATER QUALITY ONLY
	ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)
	GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)
	847 LANDFILL
	FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 18 MARCH 2019.

3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.

4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 18 MARCH 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

5. AERIAL IMAGERY SOURCE: ESRI, 04 MARCH 2020

N

0 250 500
SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP MARCH 18, 2019

evergy

OCTOBER 2022

FIGURE 2

LEGEND

MW-L 815.26 WELL NAME AND GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (AMSL), SEPTEMBER 2019

MONITORING WELL

WATER QUALITY ONLY

ESTIMATED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION CONTOUR, 0.20-FT INTERVAL (AMSL)

GROUNDWATER FLOW DIRECTION AND APPROXIMATE GROUNDWATER FLOW RATE (FEET/YEAR)

847 LANDFILL

FUTURE 847 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 03 - 04 SEPTEMBER 2019.

3. MW-35 WAS NOT INCLUDED IN THE DATA SET USED TO CREATE THE DISPLAYED GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION LINES.

4. THE GROUNDWATER FLOW RATE WAS APPROXIMATED USING THE HYDRAULIC GRADIENT CALCULATED FROM GROUNDWATER POTENTIOMETRIC ELEVATIONS MEASURED 03 - 04 SEPTEMBER 2019 AND THE CONDUCTIVITY VALUES AND EFFECTIVE POROSITY VALUES OBTAINED FROM SLUG TESTS COMPLETED APRIL 2016.

5. AERIAL IMAGERY SOURCE: ESRI, 04 MARCH 2020

N

0 250 500

SCALE IN FEET

HALEY ALDRICH

EVERGY KANSAS CENTRAL, INC.
LAWRENCE ENERGY CENTER
LAWRENCE, KANSAS

847 LANDFILL GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR MAP SEPTEMBER 03 - 04, 2019

evergy

OCTOBER 2022

FIGURE 3