

2019 ANNUAL GROUNDWATER MONITORING  
AND CORRECTIVE ACTION REPORT  
BOTTOM ASH SETTLING AREA /BOTTOM ASH LANDFILL  
JEFFREY ENERGY CENTER  
ST. MARYS, KANSAS

by Haley & Aldrich, Inc.  
Cleveland, Ohio

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Topeka, Kansas

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**2019 Annual Groundwater Monitoring  
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Jeffrey Energy Center (JEC) Bottom Ash Settling Area/Bottom Ash Landfill (BASA/BAL) 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 JEC BASA/BAL 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 Bottom Ash Settling Area/Bottom Ash Landfill (BASA/BAL) at the Jeffrey Energy Center (JEC), 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 BASA/BAL 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 § 257.90(e) of the Rule are provided in Section 2 of this Annual Report and are in bold italic font, followed by a 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 JEC BASA/BAL. The BASA/BAL is a multi-unit system 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 JEC BASA/BAL 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 BASA/BAL 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

## 2019 Annual Groundwater Monitoring and Corrective Action Report

events were completed in March and September of 2019. Statistical evaluation was completed in July 2019 on analytical data from the March 2019 detection monitoring sampling 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 JEC BASA/BAL in 2019.

### 2.2.4 Actions to Resolve Problems

No problems were encountered at the JEC BASA/BAL in 2019, therefore, no actions to resolve the 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 BASA/BAL 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 in 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 BASA/BAL 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 § 257.95 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. 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 alternative 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 BASA/BAL 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 BASA/BAL 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 BASA/BAL 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.

## TABLE

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS - DETECTION MONITORING**  
EVERGY KANSAS CENTRAL, INC.  
JEFFREY ENERGY CENTER  
BOTTOM ASH SETTLING AREA/BOTTOM ASH LANDFILL  
ST. MARYS, KANSAS

Location	Upgradient			Downgradient					
	MW-BAA-6			MW-BAA-2		MW-BAA-3		MW-BAA-7	
Measure Point (TOC)	1301.81			1226.56		1222.00		1213.15	
Sample Name	BAA-6-032719	MW-BAA-6	DUPLICATE	MW-BAA-2-032719	MW-BAA-2	BAA-3-032719	MW-BAA-3	BAA-7-032819	MW-BAA-7
Sample Date	3/27/2019	9/12/2019	9/12/2019	3/27/2019	9/13/2019	3/27/2019	9/13/2019	3/28/2019	9/13/2019
Final Lab Report Date	4/9/2019	9/23/2019	9/23/2019	4/9/2019	9/23/2019	4/9/2019	9/23/2019	4/9/2019	9/23/2019
Final Lab Report Revision Date	N/A	10/30/2019	10/30/2019	N/A	10/30/2019	N/A	10/30/2019	N/A	10/30/2019
Lab Data Reviewed and Accepted	4/15/2019	10/22/2019	10/22/2019	4/15/2019	10/22/2019	4/15/2019	10/22/2019	4/15/2019	10/22/2019
Depth to Water (ft btoc)	75.88	77.33	77.33	14.33	14.35	12.29	12.21	18.57	19.11
Temperature (Deg C)	14.7	15.09	15.09	16.0	16.95	14.2	14.81	13.3	15.91
Conductivity (µS/cm)	4247	2.441	2.441	2042	1803	3622	3587	2506	2462
Turbidity (NTU)	0.66	0.17	0.17	0.93	0.57	1.92	0.47	0.32	0.42
Boron, Total (mg/L)	5.55	1.7	1.6	1.16	1.3	2.28	2.2	0.616	0.60
Calcium, Total (mg/L)	540	369	371	191	188	531	488	207	209
Chloride (mg/L)	284	193	242	187.0	173	168	179	205	199
Fluoride (mg/L)	0.58	<0.20	<0.20	0.61	0.49	0.75	0.98	0.75	0.67
Sulfate (mg/L)	2080	1120	1210	749	751	2090	1950	934	958
pH (su)	7.1	7.3	7.1	7.4	7.6	7.1	7.2	7.3	7.4
TDS (mg/L)	3270	2680	2500	1440	1450	2810	3780	1790	1990




Notes:  
µS/cm = micro Siemens per centimeter  
ft btoc = feet below top of casing  
Deg C = degrees Celsius  
mg/L = milligrams per liter  
N/A = Not Applicable  
NTU = Nephelometric Turbidity Unit  
su = standard unit  
TDS = total dissolved solids  
TOC = top of casing  
**Bold value: Detection above laboratory reporting limit**

**FIGURE**



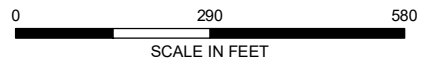


**LEGEND**

-  MONITORING WELL
-  PIEZOMETRIC OBSERVATION ONLY
-  BOTTOM ASH SETTLING AREA / BOTTOM ASH LANDFILL

**NOTES**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE, 7 MAY 2018.



**HALEY  
ALDRICH**

EVERGY KANSAS CENTRAL, INC.  
JEFFREY ENERGY CENTER  
ST. MARY'S, KANSAS

**BOTTOM ASH SETTLING AREA /  
BOTTOM ASH LANDFILL  
MONITORING WELL LOCATION MAP**

JANUARY 2020

FIGURE 1