

2020 ANNUAL GROUNDWATER MONITORING
AND CORRECTIVE ACTION REPORT
322 LANDFILL
TECUMSEH ENERGY CENTER
TECUMSEH, KANSAS

by Haley & Aldrich, Inc.
Cleveland, Ohio

for Evergy Kansas Central, Inc.
Topeka, Kansas

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Revision No.	Date	Notes
0	2/1/2021	Original
1	3/3/2021	Revised to include groundwater potentiometric contour maps for 2020

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**2020 Annual Groundwater Monitoring
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This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring program for the Tecumseh Energy Center (TEC) 322 Landfill consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2020) and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2020 Annual Groundwater Monitoring and Corrective Action Report for the TEC 322 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 2020 Annual Groundwater Monitoring and Corrective Action Report (Annual Report) addresses the 322 Landfill at the Tecumseh Energy Center (TEC), operated by Evergy Kansas Central, Inc. (Evergy). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule (Rule) effective October 19, 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 TEC 322 Landfill consistent with applicable sections of 257.90 through 257.98, and describes activities conducted in the prior calendar year (2020) and documents compliance with the Rule. The specific requirements for the annual report listed in § 257.90(e) of the Rule are provided in Sections 1 and 2 of this Annual Report and are in bold italic font, followed by a short narrative describing how each Rule requirement has been met.

1.1 40 CFR § 257.90(E)(6) SUMMARY

A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:

1.1.1 40 CFR § 257.90(e)(6)(i) – Initial Monitoring Program

At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the start of the current annual reporting period (January 1, 2020), the 322 Landfill was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

1.1.2 40 CFR § 257.90(e)(6)(ii) – Final Monitoring Program

At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95;

At the end of the current annual reporting period (December 31, 2020), the 322 Landfill was operating under an assessment monitoring program in compliance with 40 CFR § 257.95.

1.1.3 40 CFR § 257.90(e)(6)(iii) – Statistically Significant Increases

If it was determined that there was a statistically significant increase over background for one or more constituents listed in appendix III to this part pursuant to § 257.94(e):

1.1.3.1 40 CFR § 257.90(e)(6)(iii)(a)

Identify those constituents listed in appendix III to this part and the names of the monitoring wells associated with such an increase; and

The 322 Landfill is operating under an assessment monitoring program; therefore, no statistical evaluations were completed on appendix III constituents in 2020.

1.1.3.2 40 CFR § 257.90(e)(6)(iii)(b)

Provide the date when the assessment monitoring program was initiated for the CCR unit.

An assessment monitoring program was initiated on July 17, 2018 for the 322 Landfill with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. The 322 Landfill remained in assessment monitoring in 2020.

1.1.4 40 CFR § 257.90(e)(6)(iv) – Statistically Significant Levels

If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in appendix IV to this part pursuant to § 257.95(g) include all of the following:

1.1.4.1 40 CFR § 257.90(e)(6)(iv)(A) – Statistically Significant Level Constituents

Identify those constituents listed in appendix IV to this part and the names of the monitoring wells associated with such an increase;

No statistically significant levels were identified above the groundwater protection standard for those constituents listed in appendix IV to this part in 2020 for the 322 Landfill.

1.1.4.2 40 CFR § 257.90(e)(6)(iv)(B) – Initiation of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was initiated for the CCR unit;

No assessment of corrective measures was required to be initiated in 2020 for this unit. The 322 Landfill remained in assessment monitoring during 2020.

1.1.4.3 40 CFR § 257.90(e)(6)(iv)(C) – Assessment of Corrective Measures Public Meeting

Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit; and

An assessment of corrective measures was not required for the 322 Landfill in 2020; therefore, a public meeting was not held.

1.1.4.4 40 CFR § 257.90(e)(6)(iv)(D) – Completion of the Assessment of Corrective Measures

Provide the date when the assessment of corrective measures was completed for the CCR unit.

No assessment of corrective measures was required to be initiated in 2020 for this unit. The 322 Landfill remained in assessment monitoring during 2020.

1.1.5 40 CFR § 257.90(e)(6)(v) – Selection of Remedy

Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection; and

The 322 Landfill remains in assessment monitoring, and no remedy was required to be selected.

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1.1.6 40 CFR § 257.90(e)(6)(vi) – Remedial Activities

Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.

No remedial activities were required in 2020.

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 TEC 322 Landfill. The 322 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 322 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 and § 257.95 is also provided in this report. This Annual Report documents the applicable groundwater-related activities completed in the calendar year 2020.

2.2.1 Status of the Groundwater Monitoring Program

The 322 Landfill remained in the assessment monitoring program during 2020.

2.2.2 Key Actions Completed

The 2019 Annual Groundwater Monitoring and Corrective Action Report was completed in January 2020. Statistical evaluation was completed in January 2020 on analytical data from the September 2019 semi-annual assessment monitoring sampling event.

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A semi-annual assessment monitoring sampling event was completed in March 2020 for detected appendix IV constituents identified from the June 2019 annual assessment monitoring sampling event. Statistical evaluation was completed in July 2020 on analytical data from the March 2020 semi-annual assessment monitoring sampling event.

An annual assessment monitoring sampling event was completed in June 2020 to identify detected appendix IV constituents for subsequent semi-annual sampling events in September 2020 and planned for March 2021. Semi-annual assessment monitoring sampling was completed in September 2020 for detected appendix IV constituents identified during the June 2020 annual monitoring event. Statistical evaluation of the results from the September 2020 semi-annual assessment monitoring sampling event are due to be completed in January 2021 and will be reported in the next annual report.

2.2.3 Problems Encountered

One problem encountered during groundwater monitoring activities in 2020 consisted of laboratory analytical errors that required the laboratory to reanalyze select analytical results. The calcium result was reanalyzed for MW-5 for the March 2020 semi-annual assessment monitoring sampling event due to a suspected erroneous analytical result. This was the only issue that needed to be addressed at the 322 Landfill in 2020.

2.2.4 Actions to Resolve Problems

The resolution to problems encountered in 2020 included additional laboratory analyses as described above. The analytical results were revised accordingly. No other problems were encountered at the 322 Landfill in 2020; therefore, no actions to resolve problems were required.

2.2.5 Project Key Activities for Upcoming Year

Key activities planned for 2021 include the completion of the 2020 Annual Groundwater Monitoring and Corrective Action Report, statistical evaluation of semi-annual assessment monitoring analytical data collected in September 2020, semi-annual assessment monitoring and subsequent statistical evaluations, and annual assessment monitoring.

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 322 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 2020.

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 § 257.95(b) and § 257.95(d)(1), three independent assessment monitoring samples from each background and downgradient monitoring well were collected in 2020. A summary including sample names, dates of sample collection, field parameters, and monitoring data obtained for the groundwater monitoring program for the 322 Landfill is presented in Table I of this report. Groundwater potentiometric elevation contour maps associated with each groundwater monitoring sampling event in 2020 are provided in Figures 2 through 4.

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

The assessment monitoring program was initiated on July 17, 2018 with a notification establishing assessment monitoring provided on August 15, 2018 to meet the requirements of 40 CFR § 257.95. The FAL remained in assessment monitoring during 2020.

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 activities completed in calendar year 2020.

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.

This unit is in assessment monitoring; therefore, no detection monitoring alternate source 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).

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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).

An assessment monitoring program has been implemented at the CCR unit since July 17, 2018. Three rounds of assessment monitoring sampling were completed in 2020. Analytical results for both downgradient and upgradient wells are provided in Table I. The background concentrations (upper tolerance limits) and groundwater protection standards established for detected appendix IV constituents for the 322 Landfill are included in Tables II and III. The background concentrations and groundwater protection standards provided in Tables II and III were utilized for the statistical evaluations completed in 2020 for September 2019 and March 2020 semi-annual assessment monitoring sampling events, respectively.

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 2020. The 322 Landfill remained in assessment monitoring during 2020.

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

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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 monitoring of corrective measures was required to be initiated in 2020; therefore, no demonstration or certification is applicable for this unit.

TABLES

TABLE I
SUMMARY OF ANALYTICAL RESULTS - 2020 ASSESSMENT MONITORING

EVERGY KANSAS CENTRAL, INC.
 TECUMSEH ENERGY CENTER
 322 ASH LANDFILL
 TECUMSEH, KANSAS

Location	Upgradient			Downgradient							Downgradient				
	MW-4			MW-1				MW-5			MW-6				
	936.48			904.65				916.18			911.28				
Measure Point (TOC)	MW-4-030820	MW-04-060820	MW-04-091620	MW-01-030920	MW-01-060820	MW-01-091620	DUP-TEC-091620	MW-5-030920	MW-05-060820	MW-05-091620	MW-6-030820	DUP-030820	MW-06-060820	DUP-322 LF-060820	MW-06-091620
Sample Name	MW-4-030820	MW-04-060820	MW-04-091620	MW-01-030920	MW-01-060820	MW-01-091620	DUP-TEC-091620	MW-5-030920	MW-05-060820	MW-05-091620	MW-6-030820	DUP-030820	MW-06-060820	DUP-322 LF-060820	MW-06-091620
Sample Date	03/08/2020	06/08/2020	9/16/2020	03/09/2020	06/08/2020	9/16/2020	9/16/2020	03/09/2020	06/08/2020	9/16/2020	03/08/2020	03/08/2020	06/08/2020	06/08/2020	9/16/2020
Final Lab Report Date	3/18/2020	6/18/2020	9/28/2020	3/18/2020	6/18/2020	9/28/2020	9/28/2020	3/18/2020	6/18/2020	9/28/2020	3/18/2020	3/18/2020	6/18/2020	6/18/2020	9/28/2020
Final Lab Report Revision Date	3/26/2020	N/A	N/A	3/26/2020	N/A	N/A	N/A	3/26/2020	N/A	N/A	3/26/2020	3/26/2020	N/A	N/A	N/A
Final Radiation Lab Report Date	3/31/2020	6/30/2020	N/A	3/31/2020	6/30/2020	N/A	N/A	3/31/2020	6/30/2020	N/A	3/31/2020	3/31/2020	6/30/2020	6/30/2020	N/A
Final Radiation 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	N/A	N/A	N/A
Lab Data Reviewed and Accepted	4/17/2020	7/15/2020	10/26/2020	4/17/2020	7/15/2020	10/26/2020	10/26/2020	4/17/2020	7/15/2020	10/26/2020	4/17/2020	4/17/2020	7/15/2020	7/15/2020	10/26/2020
Depth to Water (ft btoc)	3.92	2.40	4.27	3.86	4.12	4.18	-	5.46	5.45	5.68	8.25	8.25	8.32	-	8.39
Temperature (Deg C)	7.36	18.12	17.60	6.04	18.18	16.53	-	6.52	18.35	20.39	9.33	-	20.51	-	18.13
Conductivity, Field (µS/cm)	1304	1630	1640	907	1120	1260	-	1624	1880	2050	1544	-	1890	-	1890
Turbidity, Field (NTU)	3.66	0.0	0.0	7.96	4.8	0.0	-	0.82	0.0	0.0	7.07	-	0.0	-	0.0
Boron, Total (mg/L)	< 0.10	-	< 0.10	0.59	-	0.14	0.15	0.92	-	1.7	0.65	0.67	-	-	0.75
Calcium, Total (mg/L)	186	-	172	141	-	155	157	322	-	355	296	296	-	-	280
Chloride (mg/L)	260	-	258	19.5	-	49.5	49.2	31.3	-	26.4	60.2	58.3	-	-	70.4
Fluoride (mg/L)	< 0.20	0.28	0.28	0.33	0.43	0.39	0.39	< 0.20	0.29	0.32	0.25	0.24	0.37	0.37	0.38
Sulfate (mg/L)	162	-	165	365	-	351	352	860	-	1000	828	848	-	-	735
pH (lab) (su)	7.4	-	7.0	7	-	6.9	6.9	6.9	-	6.8	7.3	7.6	-	-	6.9
TDS (mg/L)	1040	-	1110	871	-	901	873	1710	-	1810	1580	1570	-	-	1530
Antimony, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Arsenic, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Barium, Total (mg/L)	0.11	0.10	0.11	0.12	0.12	0.073	0.075	0.016	0.020	0.021	0.021	0.018	0.017	0.017	0.016
Beryllium, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Cadmium, Total (mg/L)	-	< 0.00050	-	-	< 0.00050	-	-	-	< 0.00050	-	-	-	< 0.00050	< 0.00050	-
Chromium, Total (mg/L)	-	< 0.0050	-	-	< 0.0050	-	-	-	< 0.0050	-	-	-	< 0.0050	0.049	-
Cobalt, Total (mg/L)	< 0.0010	< 0.0010	< 0.0010	0.0011	0.0018	0.0014	0.0015	0.0013	0.0019	0.0019	0.0026	0.0028	0.0026	0.0026	0.0025
Lead, Total (mg/L)	-	< 0.010	-	-	< 0.010	-	-	-	< 0.010	-	-	-	< 0.010	< 0.010	-
Lithium, Total (mg/L)	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.013	0.011	0.013	< 0.010	0.011	< 0.010	< 0.010	0.014
Molybdenum, Total (mg/L)	-	< 0.20	< 0.0010	-	< 0.20	< 0.010	< 0.010	-	< 0.20	< 0.0010	-	-	< 0.20	< 0.20	< 0.0010
Selenium, Total (mg/L)	-	< 0.0010	-	-	0.0011	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Thallium, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Mercury, Total (mg/L)	-	< 0.0010	-	-	< 0.0010	-	-	-	< 0.0010	-	-	-	< 0.0010	< 0.0010	-
Radium-226 & 228 (pCi/L)	1.41 ± 0.544 (0.720)	0.949 ± 0.832 (1.25)	-	0.375 ± 0.495 (0.791)	1.03 ± 0.772 (1.09)	-	-	0.878 ± 0.481 (0.681)	0.837 ± 0.842 (1.19)	-	1.25 ± 0.549 (0.681)	1.09 ± 0.529 (0.823)	0.385 ± 0.795 (1.37)	0.472 ± 0.588 (0.990)	-

Notes and Abbreviations:
 Bold value: Detection above laboratory reporting limit or minimum detectable concentration (MDC).
 Radiological results are presented as activity plus or minus uncertainty with MDC.
 Data presented in this table were verified against the laboratory and validation reports.
 µS/cm = micro Siemens per centimeter
 Deg C = degrees Celsius
 ft btoc = feet below top of casing
 mg/L = milligrams per liter
 N/A = Not Applicable
 NTU = Nephelometric Turbidity Unit
 pCi/L = picroCuries per liter
 su = standard unit
 TDS = total dissolved solids
 TOC = top of casing

TABLE II
ASSESSMENT GROUNDWATER MONITORING - DETECTED APPENDIX IV GWPS
 SEPTEMBER 2019 SAMPLING EVENT
 TECUMSEH ENERGY CENTER
 322 LANDFILL
 TECUMSEH, KANSAS

Well #	Background Value ¹	GWPS
CCR Appendix-IV Barium, Total (mg/L)		
MW-4 (upgradient)	0.140	NA
MW-1		2
MW-5		2
MW-6		2
CCR Appendix-IV Cobalt, Total (mg/L)		
MW-4 (upgradient)	0.001	NA
MW-1		0.006
MW-5		0.006
MW-6		0.006
CCR Appendix-IV Fluoride, Total (mg/L)		
MW-4 (upgradient)	0.350	NA
MW-1		4.0
MW-5		4.0
MW-6		4.0
CCR Appendix-IV Lithium, Total (mg/L)		
MW-4 (upgradient)	0.010	NA
MW-1		0.040
MW-5		0.040
MW-6		0.040
CCR Appendix-IV Radium-226 & 228 Combined (pCi/L)		
MW-4 (upgradient)	3.1	NA
MW-1		5
MW-5		5
MW-6		5

Notes and Abbreviations:

¹ Based on background data collected through September 2018.

CCR = Coal Combustion Residuals

GWPS = Groundwater Protection Standard

mg/L = milligrams per Liter

NA = Not Applicable

pCi/L = picoCuries per Liter

TABLE III
ASSESSMENT GROUNDWATER MONITORING - DETECTED APPENDIX IV GWPS
MARCH 2020 SAMPLING EVENT
TECUMSEH ENERGY CENTER
322 LANDFILL
TECUMSEH, KANSAS

Well Number	Background Value ¹	GWPS
CCR Appendix-IV Barium, Total (mg/L)		
MW-4 (upgradient)	0.137	NA
MW-1		2
MW-5		2
MW-6		2
CCR Appendix-IV Cobalt, Total (mg/L)		
MW-4 (upgradient)	0.001	NA
MW-1		0.006
MW-5		0.006
MW-6		0.006
CCR Appendix-IV Fluoride, Total (mg/L)		
MW-4 (upgradient)	0.350	NA
MW-1		4.0
MW-5		4.0
MW-6		4.0
CCR Appendix-IV Lithium, Total (mg/L)		
MW-4 (upgradient)	0.010	NA
MW-1		0.040
MW-5		0.040
MW-6		0.040
CCR Appendix-IV Radium-226 & 228 Combined (pCi/L)		
MW-4 (upgradient)	2.825	NA
MW-1		5
MW-5		5
MW-6		5

Notes and Abbreviations:

¹ Based on background data collected through March 2020.

CCR = Coal Combustion Residuals

GWPS = Groundwater Protection Standard

mg/L = milligrams per Liter

NA = Not Applicable

pCi/L = picoCuries per Liter

FIGURES



LEGEND

-  MONITORING WELL
-  PIEZOMETER OBSERVATION ONLY
-  322 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
4. AERIAL IMAGERY SOURCE: ESRI, NOVEMBER 7, 2019



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

**322 LANDFILL MONITORING
WELL LOCATION MAP**



MARCH 2021



LEGEND

- MW-1
900.47 WELL NAME AND GROUNDWATER ELEVATION (MARCH 8, 2020)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION, 2-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- 322 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 08 MARCH 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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

322 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
MARCH 08, 2020



MARCH 2021



LEGEND

- MW-1
900.47 WELL NAME AND GROUNDWATER ELEVATION (JUNE 8, 2020)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION, 2-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- 322 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 08 JUNE 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



**HALEY
ALDRICH**

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**322 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
JUNE 08, 2020**

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MARCH 2021

FIGURE 3



LEGEND

- MW-1 900.47** WELL NAME AND GROUNDWATER ELEVATION (SEPTEMBER 16, 2020)
- MONITORING WELL
- PIEZOMETER OBSERVATION ONLY
- GROUNDWATER POTENTIOMETRIC OBSERVATION ELEVATION, 2-FT INTERVAL (AMSL)
- ESTIMATED GROUNDWATER POTENTIOMETRIC ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- 322 LANDFILL

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. GROUNDWATER POTENTIOMETRIC ELEVATIONS WERE MEASURED 17 SEPTEMBER 2020.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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**322 LANDFILL
GROUNDWATER POTENTIOMETRIC
ELEVATION CONTOUR MAP
SEPTEMBER 16, 2020**

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MARCH 2021

FIGURE 4