

2017 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. (f/k/a Westar Energy, Inc.)  
Topeka, Kansas

File No. 129778-041  
January 2018  
Revised: March 2021



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Revision No.	Date	Notes
0	January 2018	Original
1	March 2021	Revised to include groundwater potentiometric contour maps covered in this 2017 annual report

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**2017 Annual Groundwater Monitoring  
and Corrective Action Report**

This Annual Groundwater Monitoring and Corrective Action Report documents the groundwater monitoring system 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 (2017) and documents compliance with the U.S. Environmental Protection Agency Coal Combustion Residual Rule. I certify that the 2017 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 2017 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; f/k/a Westar Energy, Inc.). This Annual Report was developed in accordance with the U.S. Environmental Protection Agency Coal Combustion Residual (CCR) Rule effective October 19, 2015 (Rule), 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 (2017) 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 short narrative describing how each Rule requirement has been met.

## 2. 40 CFR § 257.90 Applicability

### 2.1 40 CFR § 257.90(a)

***Except as provided for in § 257.100 for inactive CCR surface impoundments, 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 257.98.***

The 322 Landfill at the Tecumseh Energy Center (TEC), which is the coal combustion residuals (CCR) management unit addressed in this Annual Groundwater Monitoring and Corrective Action Report (Annual Report), 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. In particular, this document addresses the requirement for the Owner/Operator to prepare an Annual Report per § 257.90(e) (Rule).

### 2.2 40 CFR § 257.90(e)

***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 is the initial report for the TEC 322 Landfill as required by the Rule as the groundwater monitoring system was established and certified by October 17, 2017. Prior to October 17, 2017, Evergy Kansas Central, Inc. (Evergy; f/k/a Westar Energy, Inc.) installed a groundwater monitoring system at the 322 Landfill consistent with § 257.91. Groundwater sampling and analysis were conducted per the 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 activities completed in the calendar year 2017.

### 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. In addition, this information is presented in the CCR Groundwater Monitoring Network Description Report prepared for Evergy, which was placed in the facility's operating record by October 17, 2017 as required by § 257.105(h)(2).

**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;***

The design and construction of the monitoring well network for the TEC 322 Landfill are described in the CCR Groundwater Monitoring Network Description Report dated October 17, 2017. This report was placed in the facility's operating record by October 17, 2017, as required by § 257.105(h)(2). Since the groundwater monitoring system was certified, no new monitoring wells were installed or decommissioned.

**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), eight independent samples from each background and downgradient monitoring well were collected prior to October 17, 2017. A summary table including the sample names, dates of sample collection, reason for sample collection (detection or assessment), and monitoring data obtained for the groundwater monitoring program for the 322 Landfill is presented in Table I of this report. In 2017, the groundwater monitoring sampling and laboratory analyses were completed under the detection monitoring program. Groundwater potentiometric elevation contour maps associated with each groundwater monitoring sampling event in 2016 and 2017 are provided in Figures 2 through 9.

**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***

Detection monitoring was conducted in accordance with § 257.94(b), and no transitions between monitoring programs occurred for the 322 Landfill in calendar year 2017.

**2017 Annual Groundwater Monitoring  
and Corrective Action Report**

**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 initial 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 to information that must be placed in the Annual Report; however, none of the activities referenced as required in the Annual Report are relevant to the groundwater monitoring program for activities completed in calendar year 2017.



## TABLE

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS**  
 EVERGY KANSAS CENTRAL, INC.  
 TECUMSEH ENERGY CENTER  
 322 LANDFILL  
 TECUMSEH, KANSAS

Location	Measure Point Elevation (TOC)	Sample Name	Sample Date	Depth to Water (btoc)	Groundwater Elevation (ft AMSL)	Field Parameters				USEPA Appendix III Constituents (mg/L)								
						Temperature (Deg C)	Conductivity (µS/cm)	Turbidity (NTU)	pH (su)	Boron, Total	Calcium, Total	Chloride	Fluoride	Sulfate	pH (su)	TDS		
Up Gradient	MW-4	936.48	MW-4-081716	8/17/2016	4.90	931.58	<b>21.04</b>	<b>1730</b>	<b>6.2</b>	<b>7.09</b>	<0.10	<b>179</b>	<b>263</b>	<b>0.24</b>	<b>137</b>	<b>7.0</b>	<b>1070</b>	
			MW-4-092016	9/20/2016	3.74	932.74	<b>19.14</b>	<b>1780</b>	<b>3.4</b>	<b>6.90</b>	<0.10	<b>176</b>	<b>271</b>	<b>0.24</b>	<b>141</b>	<b>7.2</b>	<b>1080</b>	
			MW-4-110116	11/1/2016	3.96	932.52	<b>16.52</b>	<b>1720</b>	<b>3.4</b>	<b>6.87</b>	<0.10	<b>180</b>	<b>251</b>	<b>0.23</b>	<b>128</b>	<b>7.2</b>	<b>1060</b>	
			MW-4-121316	12/13/2016	4.08	932.40	<b>10.26</b>	<b>1740</b>	<b>7.0</b>	<b>6.85</b>	<0.10	<b>183</b>	<b>268</b>	<b>0.24</b>	<b>142</b>	<b>7.3</b>	<b>935</b>	
			MW-4-020617	2/6/2017	4.16	932.32	<b>10.54</b>	<b>1710</b>	<b>4.4</b>	<b>6.86</b>	<0.10	<b>188</b>	<b>263</b>	<0.20	<b>140</b>	<b>7.2</b>	<b>1000</b>	
			MW-4-040517	4/5/2017	3.05	933.43	<b>11.78</b>	<b>1700</b>	<b>5.4</b>	<b>7.04</b>	<0.10	<b>182</b>	<b>261</b>	<b>0.23</b>	<b>143</b>	<b>7.2</b>	<b>1030</b>	
			MW-4-052317	5/23/2017	3.81	932.67	<b>15.45</b>	<b>1720</b>	<b>5.1</b>	<b>6.96</b>	<0.10	<b>173</b>	<b>266</b>	<0.20	<b>126</b>	<b>7.3</b>	<b>980</b>	
			MW-4-062717	6/27/2017	4.54	931.94	<b>15.97</b>	<b>1710</b>	<b>3.4</b>	<b>6.71</b>	<0.10	<b>180</b>	<b>255</b>	<0.20	<b>137</b>	<b>7.2</b>	<b>1040</b>	
Down Gradient	MW-1	904.65	MW-1-081816	8/18/2016	4.56	900.09	<b>17.84</b>	<b>1266</b>	<b>4.0</b>	<b>7.03</b>	<0.10	<b>158</b>	<b>42.6</b>	<b>0.32</b>	<b>337</b>	<b>7.0</b>	<b>920</b>	
			MW-1-092016	9/20/2016	3.83	900.82	<b>19.09</b>	<b>1305</b>	<b>2.6</b>	<b>6.85</b>	<b>0.15</b>	<b>158</b>	<b>39.3</b>	<b>0.36</b>	<b>359</b>	<b>7.2</b>	<b>913</b>	
			MW-1-110116	11/1/2016	3.92	900.73	<b>16.69</b>	<b>1388</b>	<b>8.3</b>	<b>6.69</b>	<b>0.31</b>	<b>171</b>	<b>29.6</b>	<b>0.39</b>	<b>452</b>	<b>7.1</b>	<b>925</b>	
			MW-1-121316	12/13/2016	4.01	900.64	<b>11.82</b>	<b>1405</b>	<b>40.9</b>	<b>6.93</b>	<b>0.38</b>	<b>168</b>	<b>21.4</b>	<b>0.36</b>	<b>400</b>	<b>7.3</b>	<b>937</b>	
			MW-1-020617	2/6/2017	3.96	900.69	<b>10.37</b>	<b>1390</b>	<b>45.5</b>	<b>6.89</b>	<b>0.34</b>	<b>184</b>	<b>22.5</b>	<b>0.30</b>	<b>450</b>	<b>7.0</b>	<b>993</b>	
			MW-1-040517	4/5/2017	3.39	901.26	<b>11.48</b>	<b>1385</b>	<b>25.6</b>	<b>6.97</b>	<b>0.50</b>	<b>176</b>	<b>22.5</b>	<b>0.46</b>	<b>455</b>	<b>7.1</b>	<b>984</b>	
			MW-1-052417	5/24/2017	3.80	900.85	<b>14.04</b>	<b>1330</b>	<b>9.7</b>	<b>6.90</b>	<b>0.88</b>	<b>165</b>	<b>18.7</b>	<b>0.37</b>	<b>357</b>	<b>7.4</b>	<b>905</b>	
				MW-1-062717	6/27/2017	4.05	900.60	<b>16.06</b>	<b>1387</b>	<b>6.3</b>	<b>6.82</b>	<b>0.84</b>	<b>171</b>	<b>19.4</b>	<b>0.39</b>	<b>358</b>	<b>7.1</b>	<b>999</b>
	MW-5	916.18	MW-5-081816	8/18/2016	6.12	910.06	<b>20.91</b>	<b>1800</b>	<b>25.6</b>	<b>7.00</b>	<b>0.35</b>	<b>241</b>	<b>49.2</b>	<b>0.25</b>	<b>653</b>	<b>6.9</b>	<b>1380</b>	
			MW-5-092016	9/20/2016	5.41	910.77	<b>19.14</b>	<b>2280</b>	<b>3.5</b>	<b>6.79</b>	<b>1.2</b>	<b>291</b>	<b>49.3</b>	<b>0.28</b>	<b>868</b>	<b>7.0</b>	<b>1690</b>	
			MW-5-110116	11/1/2016	5.48	910.70	<b>16.63</b>	<b>2340</b>	<b>3.0</b>	<b>6.57</b>	<b>1.2</b>	<b>316</b>	<b>45.3</b>	<b>0.33</b>	<b>1020</b>	<b>7.0</b>	<b>1810</b>	
			MW-5-121316	12/13/2016	5.94	910.24	<b>10.15</b>	<b>2280</b>	<b>6.7</b>	<b>6.69</b>	<b>1.0</b>	<b>303</b>	<b>45.3</b>	<b>0.33</b>	<b>797</b>	<b>7.1</b>	<b>1620</b>	
			MW-5-020617	2/6/2017	6.10	910.08	<b>10.69</b>	<b>2280</b>	<b>4.9</b>	<b>6.49</b>	<b>0.98</b>	<b>321</b>	<b>45.9</b>	<0.20	<b>874</b>	<b>6.9</b>	<b>1740</b>	
			MW-5-040517	4/5/2017	4.83	911.35	<b>12.15</b>	<b>2240</b>	<b>5.3</b>	<b>6.81</b>	<b>1.2</b>	<b>318</b>	<b>42.9</b>	<b>0.30</b>	<b>892</b>	<b>7.0</b>	<b>1650</b>	
			MW-5-052317	5/23/2017	5.45	910.73	<b>14.64</b>	<b>2180</b>	<b>3.8</b>	<b>6.85</b>	<b>1.1</b>	<b>299</b>	<b>40.9</b>	<b>0.28</b>	<b>829</b>	<b>7.4</b>	<b>1530</b>	
				MW-5-062717	6/27/2017	5.61	910.57	<b>16.38</b>	<b>2160</b>	<b>2.6</b>	<b>6.65</b>	<b>1.1</b>	<b>297</b>	<b>39.6</b>	<b>0.42</b>	<b>786</b>	<b>7.0</b>	<b>1690</b>
	MW-6	911.28	MW-6-081716	8/17/2016	8.53	902.75	<b>20.71</b>	<b>2110</b>	<b>188</b>	<b>7.08</b>	<b>1.1</b>	<b>275</b>	<b>65.8</b>	<b>0.28</b>	<b>764</b>	<b>7.0</b>	<b>1790</b>	
			MW-6-092016	9/20/2016	8.02	903.26	<b>19.75</b>	<b>2160</b>	<b>94.0</b>	<b>6.93</b>	<b>1.1</b>	<b>276</b>	<b>64.3</b>	<b>0.31</b>	<b>857</b>	<b>7.1</b>	<b>1690</b>	
			MW-6-110116	11/1/2016	8.01	903.27	<b>18.26</b>	<b>2210</b>	<b>23.5</b>	<b>6.75</b>	<b>1.1</b>	<b>311</b>	<b>59.4</b>	<b>0.39</b>	<b>975</b>	<b>7.1</b>	<b>1690</b>	
			MW-6-121316	12/13/2016	8.15	903.13	<b>13.10</b>	<b>2250</b>	<b>22.0</b>	<b>6.91</b>	<b>1.0</b>	<b>302</b>	<b>60.3</b>	<b>0.29</b>	<b>835</b>	<b>7.2</b>	<b>1620</b>	
			MW-6-020617	2/6/2017	8.21	903.07	<b>10.91</b>	<b>2250</b>	<b>7.3</b>	<b>6.73</b>	<b>1.1</b>	<b>323</b>	<b>59.8</b>	<b>0.28</b>	<b>876</b>	<b>7.0</b>	<b>1800</b>	
MW-6-040517			4/5/2017	6.90	904.38	<b>12.30</b>	<b>2320</b>	<b>6.4</b>	<b>6.98</b>	<b>0.98</b>	<b>328</b>	<b>59.8</b>	<b>0.38</b>	<b>967</b>	<b>7.2</b>	<b>1810</b>		
MW-6-052417			5/24/2017	8.04	903.24	<b>11.98</b>	<b>2300</b>	<b>7.8</b>	<b>6.75</b>	<b>0.92</b>	<b>330</b>	<b>63.0</b>	<b>0.31</b>	<b>853</b>	<b>7.4</b>	<b>1680</b>		
			MW-6-062717	6/27/2017	8.22	903.06	<b>15.74</b>	<b>2240</b>	<b>5.2</b>	<b>6.76</b>	<b>0.86</b>	<b>323</b>	<b>61.1</b>	<b>0.50</b>	<b>874</b>	<b>7.1</b>	<b>1700</b>	

**ABBREVIATIONS AND NOTES:**

**Bold value: Detection above laboratory reporting limit**  
 USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257. <https://www.epa.gov/coalash/coal-ash-rule>  
 µS/cm = microSiemen per centimeter  
 btoc = below top of casing  
 C = Celsius  
 CCR = coal combustion residuals  
 ft AMSL = feet above mean sea level  
 MCL = maximum contaminant level  
 mg/L = milligrams per liter  
 NA = not applicable  
 NTU = Nephelometric Turbidity Units  
 pCi/L = picoCurie per liter  
 su = standard units  
 TDS = total dissolved solids  
 TOC = top of casing  
 USEPA = United States Environmental Protection Agency

**TABLE I**  
**SUMMARY OF ANALYTICAL RESULTS**  
 EVERGY KANSAS CENTRAL, INC.  
 TECUMSEH ENERGY CENTER  
 322 LANDFILL  
 TECUMSEH, KANSAS

Location	Measure Point Elevation (TOC)	Sample Name	Sample Date	Depth to Water (btoc)	Groundwater Elevation (ft AMSL)	USEPA Appendix IV Constituents (mg/L)														USEPA Appendix IV Constituents (pCi/L)		
						Antimony, Total	Arsenic, Total	Barium, Total	Beryllium, Total	Cadmium, Total	Chromium, Total	Cobalt, Total	Lead, Total	Lithium, Total	Molybdenum, Total	Selenium, Total	Thallium, Total	Mercury, Total	Fluoride		Radium-226 & 228 Combined	
Up Gradient	MW-4	936.48	MW-4-081716	8/17/2016	4.90	931.58	<0.0010	<0.0010	<b>0.14</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.24</b>	<b>1.92</b>	
			MW-4-092016	9/20/2016	3.74	932.74	<0.0010	<0.0010	<b>0.13</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.24</b>	<b>2.46</b>
			MW-4-110116	11/1/2016	3.96	932.52	<0.0010	<0.0010	<b>0.12</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.23</b>	<b>2.11</b>
			MW-4-121316	12/13/2016	4.08	932.40	<0.0010	<0.0010	<b>0.12</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.24</b>	<b>1.12</b>
			MW-4-020617	2/6/2017	4.16	932.32	<0.0010	<0.0010	<b>0.12</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<0.20	<b>0.879</b>
			MW-4-040517	4/5/2017	3.05	933.43	<0.0010	<0.0010	<b>0.11</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.23</b>	<b>1.10</b>
			MW-4-052317	5/23/2017	3.81	932.67	<0.0010	<0.0010	<b>0.11</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<0.20	<b>0.885</b>
MW-4-062717	6/27/2017	4.54	931.94	<0.0010	<0.0010	<b>0.12</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<0.20	<b>2.64</b>			
Down Gradient	MW-1	904.65	MW-1-081816	8/18/2016	4.56	900.09	<0.0010	<0.0010	<b>0.094</b>	<0.0010	<0.00050	<0.0050	<b>0.0029</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.32</b>	<b>0.56</b>	
			MW-1-092016	9/20/2016	3.83	900.82	<0.0010	<0.0010	<b>0.12</b>	<0.0010	<0.00050	<0.0050	<b>0.0054</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.36</b>	<b>1.78</b>
			MW-1-110116	11/1/2016	3.92	900.73	<0.0010	<0.0010	<b>0.20</b>	<0.0010	<0.00050	<0.0050	<b>0.0086</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.39</b>	<b>0.997</b>
			MW-1-121316	12/13/2016	4.01	900.64	<0.0010	<0.0010	<b>0.16</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.36</b>	<b>0.164</b>
			MW-1-020617	2/6/2017	3.96	900.69	<0.0010	<0.0010	<b>0.20</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.30</b>	<b>0.467</b>
			MW-1-040517	4/5/2017	3.39	901.26	<0.0010	<0.0010	<b>0.20</b>	<0.0010	<0.00050	<0.0050	<b>0.0014</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.46</b>	<b>0.455</b>
			MW-1-052417	5/24/2017	3.80	900.85	<0.0010	<b>0.0017</b>	<b>0.19</b>	<0.0010	<0.00050	<0.0050	<0.0010	<0.0050	<0.010	<b>0.0011</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.37</b>	<b>1.07</b>
	MW-1-062717	6/27/2017	4.05	900.60	<0.0010	<b>0.0023</b>	<b>0.20</b>	<0.0010	<0.00050	<0.0050	<b>0.0014</b>	<0.0050	<0.010	<b>0.0011</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.39</b>	<b>0.174</b>		
	MW-5	916.18	MW-5-081816	8/18/2016	6.12	910.06	<0.0010	<0.0010	<b>0.04</b>	<0.0010	<0.00050	<0.0050	<b>0.0011</b>	<0.0050	<b>0.021</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.25</b>	<b>1.04</b>	
			MW-5-092016	9/20/2016	5.41	910.77	<0.0010	<0.0010	<b>0.033</b>	<0.0010	<0.00050	<0.0050	<b>0.0018</b>	<0.0050	<b>0.019</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.28</b>	<b>1.07</b>	
			MW-5-110116	11/1/2016	5.48	910.70	<0.0010	<0.0010	<b>0.030</b>	<0.0010	<0.00050	<0.0050	<b>0.0021</b>	<0.0050	<b>0.022</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.33</b>	<b>1.48</b>	
			MW-5-121316	12/13/2016	5.94	910.24	<0.0010	<0.0010	<b>0.028</b>	<0.0010	<0.00050	<0.0050	<b>0.0020</b>	<0.0050	<b>0.024</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.33</b>	<b>1.06</b>	
			MW-5-020617	2/6/2017	6.10	910.08	<0.0010	<0.0010	<b>0.026</b>	<0.0010	<0.00050	<0.0050	<b>0.0018</b>	<0.0050	<b>0.014</b>	<0.0010	<0.0010	<0.0010	<0.00020	<0.20	<b>0.893</b>	
			MW-5-040517	4/5/2017	4.83	911.35	<0.0010	<0.0010	<b>0.021</b>	<0.0010	<0.00050	<0.0050	<b>0.0021</b>	<0.0050	<0.010	<b>0.0010</b>	<0.0010	<0.0010	<0.00020	<b>0.30</b>	<b>0.970</b>	
			MW-5-052317	5/23/2017	5.45	910.73	<0.0010	<0.0010	<b>0.022</b>	<0.0010	<0.00050	<0.0050	<b>0.0021</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.28</b>	<b>0.940</b>	
	MW-5-062717	6/27/2017	5.61	910.57	<0.0010	<0.0010	<b>0.026</b>	<0.0010	<0.00050	<0.0050	<b>0.0020</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.42</b>	<b>1.23</b>			
	MW-6	911.28	MW-6-081716	8/17/2016	8.53	902.75	<0.0010	<0.0010	<b>0.041</b>	<0.0010	<0.00050	<0.0050	<b>0.0031</b>	<0.0050	<b>0.018</b>	<b>0.0019</b>	<0.0010	<0.0010	<0.00020	<b>0.28</b>	<b>0.68</b>	
			MW-6-092016	9/20/2016	8.02	903.26	<0.0010	<0.0010	<b>0.034</b>	<0.0010	<0.00050	<0.0050	<b>0.0033</b>	<0.0050	<b>0.017</b>	<b>0.0014</b>	<0.0010	<0.0010	<0.00020	<b>0.31</b>	<b>0.35</b>	
			MW-6-110116	11/1/2016	8.01	903.27	<0.0010	<0.0010	<b>0.029</b>	<0.0010	<0.00050	<0.0050	<b>0.0031</b>	<0.0050	<b>0.018</b>	<b>0.0012</b>	<0.0010	<0.0010	<0.00020	<b>0.39</b>	<b>0.688</b>	
			MW-6-121316	12/13/2016	8.15	903.13	<0.0010	<0.0010	<b>0.028</b>	<0.0010	<0.00050	<0.0050	<b>0.0029</b>	<0.0050	<b>0.022</b>	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.29</b>	<b>0.653</b>	
			MW-6-020617	2/6/2017	8.21	903.07	<0.0010	<0.0010	<b>0.028</b>	<0.0010	<0.00050	<0.0050	<b>0.0016</b>	<0.0050	<b>0.013</b>	<b>0.0011</b>	<0.0010	<0.0010	<0.00020	<b>0.28</b>	<b>0.582</b>	
MW-6-040517			4/5/2017	6.90	904.38	<0.0010	<0.0010	<b>0.023</b>	<0.0010	<0.00050	<0.0050	<b>0.0016</b>	<0.0050	<b>0.011</b>	<b>0.0012</b>	<0.0010	<0.0010	<0.00020	<b>0.38</b>	<b>0.224</b>		
MW-6-052417			5/24/2017	8.04	903.24	<0.0010	<0.0010	<b>0.021</b>	<0.0010	<0.00050	<0.0050	<b>0.0017</b>	<0.0050	<0.010	<b>0.0010</b>	<0.0010	<0.0010	<0.00020	<b>0.31</b>	<b>1.13</b>		
MW-6-062717	6/27/2017	8.22	903.06	<0.0010	<0.0010	<b>0.019</b>	<0.0010	<0.00050	<0.0050	<b>0.0018</b>	<0.0050	<0.010	<0.0010	<0.0010	<0.0010	<0.00020	<b>0.50</b>	<b>0.545</b>				

**ABBREVIATIONS AND NOTES:**

**Bold value: Detection above laboratory reporting limit**  
 USEPA. 2016. Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities. July 26. 40 CFR Part 257. <https://www.epa.gov/coalash/coal-ash-rule>  
 μS/cm = microSiemen per centimeter  
 btoc = below top of casing  
 C = Celsius  
 CCR = coal combustion residuals  
 ft AMSL = feet above mean sea level  
 MCL = maximum contaminant level  
 mg/L = milligrams per liter  
 NA = not applicable  
 NTU = Nephelometric Turbidity Units  
 pCi/L = picoCurie per liter  
 su = standard units  
 TDS = total dissolved solids  
 TOC = top of casing  
 USEPA = United States Environmental Protection Agency



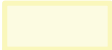

## FIGURES



GIS FILE PATH: G:\Projects\Westar\Tecumseh Energy Center (TEC)\GIS\MXDs\2018\_01\TEC\_PROPOSED\_MW\_LOC\_LANDFILL.mxd — USER: rabrown — LAST SAVED: 1/26/2018 1:41:26 PM

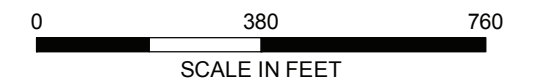


**LEGEND**

-  MONITORING WELL
-  PIEZOMETRIC OBSERVATION ONLY
-  ASH LANDFILL NO. 322
-  PROPERTY BOUNDARY

**NOTE**

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2015.



WESTAR ENERGY  
TECUMSEH ENERGY CENTER  
TECUMSEH, KANSAS

**322 LANDFILL MONITORING  
WELL LOCATION MAP**

MARCH 2021  
SCALE: AS SHOWN

**FIGURE 1**



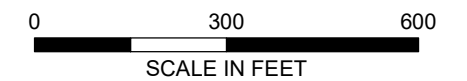


**LEGEND**

- MW-1 900.47 WELL NAME AND GROUNDWATER ELEVATION (AUGUST 17, 2016)
- 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 AUGUST 2016.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



**HALEY ALDRICH**

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

**322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
AUGUST 17, 2016**

**evergy**







MARCH 2021

FIGURE 2



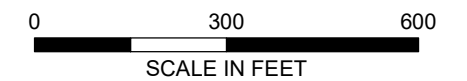


**LEGEND**

- MW-1 900.47** WELL NAME AND GROUNDWATER ELEVATION (SEPTEMBER 19, 2016)
-  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 19 SEPTEMBER 2016.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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TECUMSEH, KANSAS

322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
SEPTEMBER 19, 2016









MARCH 2021



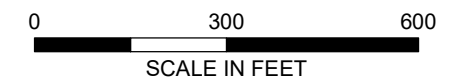


**LEGEND**

- MW-1 900.47** WELL NAME AND GROUNDWATER ELEVATION (OCTOBER 31, 2016)
-  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 31 OCTOBER 2016.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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TECUMSEH, KANSAS

**322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
OCTOBER 31, 2016**









MARCH 2021



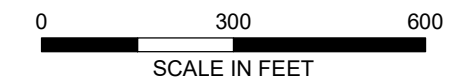


**LEGEND**

- MW-1 900.47** WELL NAME AND GROUNDWATER ELEVATION (DECEMBER 12, 2016)
-  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 12 DECEMBER 2016.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



**HALEY ALDRICH**

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

**322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
DECEMBER 12, 2016**

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MARCH 2021

FIGURE 5



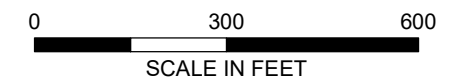


**LEGEND**

- MW-1 900.47** WELL NAME AND GROUNDWATER ELEVATION (FEBRUARY 6, 2017)
-  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 06 FEBRUARY 2017.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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TECUMSEH, KANSAS

**322 LANDFILL**  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
FEBRUARY 06, 2017



MARCH 2021



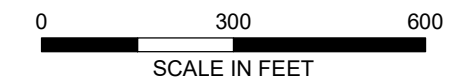


**LEGEND**

- MW-1  
900.47 WELL NAME AND GROUNDWATER ELEVATION (APRIL 5, 2017)
- 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 05 APRIL 2017.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



**HALEY  
ALDRICH**

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TECUMSEH, KANSAS

**322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
APRIL 05, 2017**

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MARCH 2021

FIGURE 7



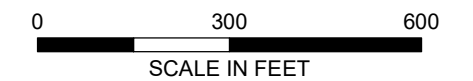


**LEGEND**

- MW-1  
900.47 WELL NAME AND GROUNDWATER ELEVATION (MAY 23, 2017)
- 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 23 MAY 2017.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



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TECUMSEH ENERGY CENTER  
TECUMSEH, KANSAS

322 LANDFILL  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
MAY 23, 2017



MARCH 2021



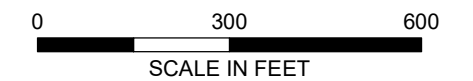


**LEGEND**

- MW-1**  
900.67 WELL NAME AND GROUNDWATER ELEVATION (JUNE 26, 2017)
- 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 26 JUNE 2017.
3. AMSL = ABOVE MEAN SEA LEVEL
4. AERIAL IMAGERY SOURCE: ESRI, 7 NOVEMBER 2019



**HALEY ALDRICH**

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TECUMSEH ENERGY CENTER  
TECUMSEH, KANSAS

**322 LANDFILL**  
GROUNDWATER POTENTIOMETRIC  
ELEVATION CONTOUR MAP  
JUNE 26, 2017

**evergy**

MARCH 2021

FIGURE 9