



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

Revision 4: October 28, 2021
Revision 3: May 24, 2021
Revision 2: December 18, 2019
Revision 1: April 17, 2019
Original: October 17, 2017
File No. 129778-041

SUBJECT: Jeffrey Energy Center – Groundwater Monitoring Systems Certification
Existing Bottom Ash Settling Area/Bottom Ash Landfill, Fly Ash Landfill, Fly Ash Landfill Area 2, Flue Gas Desulfurization Landfill (Phase IA, IB, and IC), and Bottom Ash Pond
Every Kansas Central, Inc.

Every Kansas Central, Inc. (Every) operates the subject coal combustion residuals (CCR) management units referred to as the Bottom Ash Settling Area/Bottom Ash Landfill (BASA/BAL), Fly Ash Landfill (FAL), Fly Ash Landfill Area 2 (FAL2), Flue Gas Desulfurization (FGD) Landfill, and the Bottom Ash Pond (BAP; inactive) at the Jeffrey Energy Center (JEC; the Site) located in St. Marys, Kansas. These CCR units are considered subject to the CCR Rule since they are either active or identified as inactive with a notification of intent to close as of the effective and/or applicable dates of the CCR Rule.

This document addresses the requirements of § 257.91 *Groundwater Monitoring Systems*, specifically § 257.91(f), of the U.S. Environmental Protection Agency's (USEPA) Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, Code of Federal Regulations Title 40 (40 CFR) Part 257 (CCR Rule) effective October 19, 2015, and subsequent rulemaking revisions. In addition, this document revision provides narratives outlining the basis for the design and geospatial arrangements of the CCR well monitoring networks based on site-specific conditions, established hydrogeologic principles, and industry practice, with consideration for the geometry and physical characteristics of and material contents within the CCR unit(s) being monitored.

Every has determined, based upon the recommendations of Haley & Aldrich, Inc., that a multi-unit groundwater monitoring system is preferred for the BASA/BAL as allowed pursuant to § 257.91(d). This multi-unit monitoring system is as capable of detecting monitored constituents passing the combined unit waste boundary as individual groundwater monitoring systems.

The single-unit groundwater monitoring systems at the FAL, FAL2, FGD Landfill, and the BAP, and the multi-unit groundwater monitoring system at the BASA/BAL, have been designed to include at least a minimum of one up gradient and three down gradient monitoring wells pursuant to § 257.91(c). Each of the single-unit groundwater monitoring systems, except the FAL2, includes at least one side gradient piezometer used to support the groundwater elevations and flow direction. In 2020, Every submitted a revised sampling and analysis plan, which included the groundwater monitoring system design and construction information for each monitoring well network, to the Kansas Department of Health and Environment (KDHE) for review under Kansas solid waste rules. Finding that the monitoring systems and

associated sampling plan were adequate to monitor the groundwater associated with these units, KDHE approved the updated sampling and analysis plan on September 4, 2020. Table 1 below presents the wells in each of the groundwater monitoring systems as certified herein. This certification has been prepared based upon information available in the facility Operating Record pursuant to § 257.91(e)(1).

Table 1 – CCR Unit Groundwater Monitoring Well Networks

CCR UNIT	Upgradient Monitoring Wells		Downgradient Monitoring Wells				Piezometric Observation Monitoring Well		
Bottom Ash Settling Area/Bottom Ash Landfill	MW-BAA-6		MW-BAA-2	MW-BAA-3	MW-BAA-7		MW-BAA-1	MW-BAA-5	
Fly Ash Landfill	MW-FAA-5		MW-FAA-3	MW-FAA-4	MW-FAA-6		MW-FAA-1		
Fly Ash Landfill Area 2	MW-GR-4	MW-FAA-5	MW-FAA-7	MW-FAA-8	MW-FAA-9				
Flue Gas Desulfurization Landfill (Phase IA, IB, and IC)	MW-FGD-1	MW-FGD-6	MW-FGD-2	MW-FGD-3	MW-FGD-4	MW-FGD-9	MW-FGD-5	MW-FGD-7	MW-FGD-8
Bottom Ash Pond (inactive)	IBA-4		IBA-1	IBA-2	IBA-3		TPZ-GR-4		

BASA/BAL CCR MONITORING SYSTEM

The BASA/BAL monitoring network as originally designed includes one up gradient and three down gradient monitoring wells, along with two side gradient wells utilized for potentiometric observations. The minimum number of monitoring wells is appropriate for this unit based on the size of the unit and the consistent groundwater flow direction observed during the baseline sampling events which confirmed that the down gradient monitoring wells were located to sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit.

FAL CCR MONITORING SYSTEM

The FAL monitoring network includes one up gradient and three down gradient monitoring wells, along with one side gradient well utilized for potentiometric observation. Prior to the certification of the current monitoring system, three down gradient monitoring wells were installed and sampled at the unit, which assisted in defining the groundwater flow direction. The minimum number of monitoring wells is appropriate for this unit based on the consistent groundwater flow direction observed during the baseline sampling events which confirmed that the down gradient monitoring wells were located to sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit.

FAL2 CCR MONITORING SYSTEM

The FAL2 monitoring network includes two up gradient and four down gradient monitoring wells. The current monitoring network at the unit is appropriate based on the consistent groundwater flow direction observed during the baseline sampling events, which confirmed the groundwater flow direction at the unit is toward Tower Hill Lake, which is the driving hydrogeologic feature at the Site. Up gradient monitoring well MW-FAA-5 is not used for groundwater contours as it is only utilized for additional water quality data upgradient of FAL2. The down gradient monitoring wells are located to

sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit. The current network exceeds the minimum required number of monitoring wells.

FGD LANDFILL CCR MONITORING SYSTEM

The current FGD Landfill monitoring network includes two up gradient and four down gradient monitoring wells, along with three side gradient wells utilized for potentiometric observations. The monitoring network was expanded by two monitoring wells to the current size in 2019 to provide additional groundwater monitoring coverage for the future lateral expansion of the FGD Landfill CCR Management Unit. The original monitoring network included one up gradient and three down gradient monitoring wells, along with one side-gradient well utilized for potentiometric observation. The minimum number of monitoring wells was appropriate for this unit based on the consistent groundwater flow direction observed during the baseline sampling events. The groundwater flow direction observed during these events confirmed that the down gradient monitoring wells were located to sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit. The current monitoring network at the unit is appropriate to sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit. The current network now exceeds the minimum required number of monitoring wells.

BAP CCR MONITORING SYSTEM

The BAP monitoring network includes one up gradient and three down gradient monitoring wells, along with one side gradient well utilized for potentiometric observation. The groundwater flow direction at JEC is toward Tower Hill Lake, which is the driving hydrogeologic feature at the Site. The minimum number of monitoring wells is appropriate for this unit based on the consistent groundwater flow direction observed during the baseline sampling events which confirmed that the down gradient monitoring wells were located to sufficiently detect groundwater constituents in the uppermost aquifer passing the waste boundary of the unit.

CERTIFICATION STATEMENT

Pursuant to 40 CFR Chapter I Subchapter I Part 257 Subpart D §257.91(f), I certify that the groundwater monitoring systems for the subject units have been designed and constructed to meet the requirements of § 257.91. The certification submitted is, to the best of my knowledge, accurate and complete.

Signed: 
 Certifying Engineer

Print Name: Steven F. Putrich, P.E.
 Kansas License No.: PE24363
 Title: Principal Consultant
 Company: Haley & Aldrich, Inc.



Signed: 
 Professional Geologist

Print Name: Mark D. Nicholls, P.G.
 Kansas License No.: 881
 Title: Lead Hydrogeologist
 Company: Haley & Aldrich, Inc.



Revision No.	Date	Notes
0	October 17, 2017	Original
1	April 17, 2019	Revised to clarify names of CCR Units and to include the inactive Bottom Ash Pond in subject certification.
2	December 18, 2019	Inclusion of additional lateral expansion up gradient and down gradient monitoring wells into the FGD Landfill CCR Management Unit.
3	May 24, 2021	Provide additional information supporting the rationale for the originally certified CCR monitoring well networks at BASA/BAL, FAL, FGD Landfill, and BAP.
4	October 28, 2021	Revised to include the Fly Ash Landfill Area 2 (FAL2) in subject certification.