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Revised: October 28, 2021
Revised: April 19, 2019
January 15, 2018
File No. 129778-010

Evergy Kansas Central, Inc.
818 South Kansas Avenue
Topeka, Kansas 66612

Attention: Jared Morrison – Director, Water and Waste Programs

Subject: Certification of Statistical Methods – Detection Monitoring – 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 Inactive Bottom Ash Pond Jeffrey Energy Center, St. Marys, Kansas

Dear Mr. Morrison:

Evergy Kansas Central, Inc. (Evergy) operates one inactive and four existing coal combustion residual (CCR) management units at the Jeffrey Energy Center (JEC) located in St. Marys, Kansas. These CCR management units are referred to as the Bottom Ash Settling Area/Bottom Ash Landfill (BASA/BAL; managed as a multi-unit groundwater system), Fly Ash Landfill (FAL), Fly Ash Landfill 2 (FAL2), Flue Gas Desulfurization (FGD) Landfill (Phase IA, IB, and IC), and the Bottom Ash Pond. Pursuant to Code of Federal Regulations Title 40 (40 CFR) Chapter I, Subchapter I, Part 257, Subpart D, § 257.93 (f)(6),¹ I certify that the selected statistical methods described herein are appropriate for evaluating the groundwater monitoring data for the subject CCR management units. The statistical methods described below were selected for the evaluation of the groundwater quality data collected from monitoring wells constructed in accordance with requirements of 40 CFR 257.91 *Groundwater Monitoring Systems* at the subject CCR units.


Based on attributes of the water quality dataset (i.e., distribution of the dataset), two statistical methods have been selected to evaluate groundwater quality data obtained from monitoring wells completed at the subject CCR units. The two statistical methods are prediction limits and Parametric Analysis of Variance (ANOVA).

¹ "The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer or approval from the Participating State Director or approval from the EPA where EPA is the permitting authority stating the selected statistical method is appropriate for evaluating the groundwater for the CCR management area. The certification must include a narrative description of the statistical method selected to evaluate the groundwater monitoring data."

A prediction limit procedure is one in which concentration limits for each constituent are established from the distribution of the background data, with a specified confidence level (e.g., 95 percent). The upper endpoint of concentration limits is called the upper prediction limit (UPL). Depending on the background data distribution, parametric or non-parametric prediction limits procedures are used to evaluate groundwater monitoring data using this method. Parametric prediction limits 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 prediction limit. If all the background data are non-detect, a maximum reporting limit may serve as an approximate UPL.

The ANOVA is a statistical procedure for comparing the average concentration difference between one or more groups (e.g., wells). Depending on the background data distribution, parametric or non-parametric ANOVA procedures are used to evaluate groundwater monitoring data using this method. Parametric ANOVA assesses differences in means, and non-parametric ANOVA compares median concentration levels. The method determines whether there are statistically significant differences in mean/median concentrations among a set of down gradient wells relative to the background wells. In one-way ANOVA, the null hypothesis is that the groups under comparison have equal means and that any differences in the sample means are due to chance. The alternative hypothesis is stated as the means of the groups are not equal. The decision error, level (α) value shall comply with the performance criteria set forth in § 257.93(g)(2).

This certification and the evaluation to select the statistical procedures were conducted under my direction or supervision according to a system designed to assure that qualified personnel selected the statistical procedure pursuant to 40 CFR § 257.93. 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
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Revision No.	Date	Notes
0	January 2018	Original
1	April 2019	Incorporate the Bottom Ash Pond (inactive) into certification; clarify names of CCR units
2	October 2021	Incorporate the Fly Ash Landfill Area 2 into certification