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

15 January 2018
Revised 17 April 2019
File No. 129778-010

Westar Energy, Inc.
818 South Kansas Avenue
Topeka, Kansas 66612

Attention: Jared Morrison – Sr. Manager, Water and Waste Programs

Subject: Certification of Statistical Methods – Existing Bottom Ash Settling Area/Bottom Ash Landfill, Fly Ash Landfill, Flue Gas Desulfurization Landfill (Phase IA & IB), and inactive Bottom Ash Pond
Revised to Clarify Names of CCR Units and to Include the inactive Bottom Ash Pond in Subject Certification
Jeffrey Energy Center, St. Marys, Kansas

Dear Mr. Morrison:

Westar Energy, Inc. (Westar) 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), Flue Gas Desulfurization (FGD) Landfill (Phase IA & IB), and the inactive 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 units.

Based on attributes of the water quality 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). 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

[1] "The owner or operator of the CCR unit must obtain a certification from a qualified professional engineer 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."

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 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 the 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.

STEVEN F. PUTRICH LICENSED 24363 4/17/19 KANSAS PROFESSIONAL ENGINEER

Steve Putrich Digitally signed by Steve Putrich Date: 2019.04.17 14:10:34 -07'00'

Signed: _____
Professional Geologist

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

MARK D. NICHOLLS LICENSED 881 4/17/19 KANSAS PROFESSIONAL GEOLOGIST

Mark Nicholls Digitally signed by Mark Nicholls Date: 2019.04.17 14:10:59 -07'00'

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