Statistical Method Certification (40 CFR §257.93(f)(6))
Chesterfield Power Station - Upper Ash Pond
Chester, Virginia

EPA's "*Disposal of Coal Combustion Residuals from Electric Utilities*" Final Rule, 40 CFR §257.93(f)(6), requires the owner or operator of an existing Coal Combustion Residuals (CCR) unit to obtain a certification from a qualified professional engineer stating that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area. The certification must include a narrative description of the statistical method selected to evaluate the groundwater monitoring data.

The following provides a description of the statistical methods selected to evaluate the groundwater monitoring data at Virginia Electric and Power Company's Chesterfield Power Station (Upper Ash Pond).

Statistical Methods

The selected statistical methods for evaluating the groundwater monitoring data for the Chesterfield Power Station (Upper Ash Pond) were developed in accordance with 40 CFR §257.93(f) using methodologies presented in *Statistical Analysis of Groundwater Data at RCRA Facilities, Unified Guidance*, March 2009, EPA 530/R-09-007 (Unified Guidance). The statistical methods selected for each constituent are presented in the table below.

Statistical Methods Selected for Chesterfield Power Station (Upper Ash Pond - Columbia Aquifer)	
Parameter/Constituent	Statistical Method
Boron	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
pH	Parametric Upper/Lower Prediction Limit
Sulfate	Parametric Upper Prediction Limit
Total Dissolved Solids	Non-Parametric Tolerance Limit
Fluoride	Parametric Upper Prediction Limit
Antimony	Non-Parametric Tolerance Limit
Arsenic	Parametric Upper Prediction Limit
Barium	Non-Parametric Tolerance Limit

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Beryllium	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit
Chromium	Parametric Upper Prediction Limit
Cobalt	Parametric Upper Prediction Limit
Lead	Parametric Upper Prediction Limit
Lithium	Parametric Upper Prediction Limit
Mercury	Non-Parametric Tolerance Limit
Molybdenum	Parametric (log-normal) Upper Tolerance Limit
Radium	Parametric Upper Prediction Limit
Selenium	Parametric Upper Prediction Limit
Thallium	Non-Parametric Tolerance Limit

Statistical Methods Selected for Chesterfield Power Station (Upper Ash Pond - Potomac Aquifer)	
Parameter/Constituent	Statistical Method
Boron	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
pH	Non-Parametric Upper/Lower Tolerance Limit
Sulfate	Parametric Upper Prediction Limit
Total Dissolved Solids	Non-Parametric Tolerance Limit
Fluoride	Parametric Upper Prediction Limit
Antimony	Non-Parametric Tolerance Limit
Arsenic	Non-Parametric Tolerance Limit
Barium	Non-Parametric Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit
Chromium	Parametric (log-normal) Upper Prediction Limit
Cobalt	Non-Parametric Tolerance Limit
Lead	Parametric Upper Prediction Limit
Lithium	Non-Parametric Tolerance Limit
Mercury	Non-Parametric Tolerance Limit
Molybdenum	Non-Parametric Tolerance Limit

Radium	Parametric (log-normal) Upper Tolerance Limit
Selenium	Non-Parametric Tolerance Limit
Thallium	Non-Parametric Tolerance Limit

As presented, the statistical test methods used for the initial evaluation of groundwater monitoring data at the Chesterfield Power Station (Upper Ash Pond) are based on the prediction interval and tolerance limit methods. Interwell statistical methods are proposed – meaning that data from downgradient wells will be compared to upgradient background groundwater quality. Using this approach, background data from the network of upgradient wells is pooled to calculate an upper Prediction Limit (PL) or an upper Tolerance Limit (TL) for each parameter/constituent. The pooled background data set for each constituent was first tested for the presence of outliers. Extreme values identified during outlier testing were removed from the dataset. The background datasets for each constituent were then tested for normality. The selected statistical method for each constituent is based on the results of normality testing. For constituent datasets that exhibited a normal or log-normal distribution, parametric statistical procedures have been selected. For constituent datasets that exhibited a non-normal distribution, non-parametric statistical procedures have been selected.

Further details regarding the statistical methods used to evaluate the groundwater monitoring data are presented in the Unified Guidance.

CERTIFICATION

I hereby certify that the selected statistical methods are appropriate for evaluating the groundwater monitoring data for the CCR management area in accordance with the requirements of 40 CFR §257.93.

As used herein, the word "certify" shall mean an expression of the Engineer's professional opinion to the best of his or her information, knowledge, and belief, and does not constitute a warranty or guarantee by the Engineer.

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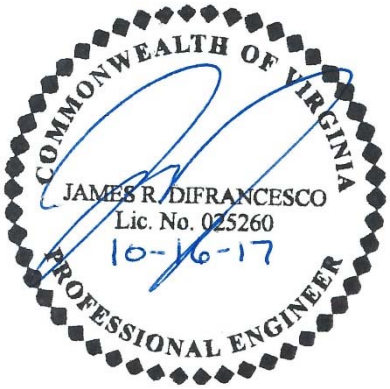

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