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2020 Updated Statistical Method Certification (40 CFR §257.93(f)(6))
Chesterfield Power Station – Fossil Fuel Combustion Products Management Facility
Solid Waste Permit #609
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 Fossil Fuel Combustion Products Management Facility, Solid Waste Permit No. 609 (FFCP Management Facility) for the 2020 background update.

Statistical Methods

The selected statistical methods for evaluating the groundwater monitoring data for the Chesterfield Power Station FFCP Management Facility 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.

2020 Background Updated Statistical Methods Selected for Chesterfield Power Station Fossil Fuel Combustion Products Management Facility	
Parameter/Constituent	**Statistical Method**
Boron	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
pH	Parametric Lower/Upper Prediction Limit
Sulfate	Non-Parametric Tolerance Limit
Total Dissolved Solids	Non-Parametric Tolerance Limit
Fluoride	Non-Parametric Tolerance Limit
Antimony	Non-Parametric Tolerance Limit
Arsenic	Non-Parametric Tolerance Limit
Barium	Non-Parametric Tolerance Limit

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Parameter/Constituent	**Statistical Method**
Beryllium	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit
Chromium	Parametric Upper Prediction Limit
Cobalt	Non-Parametric Tolerance Limit
Lead	Non-Parametric Tolerance Limit
Lithium	Non-Parametric Tolerance Limit
Mercury	Non-Parametric Tolerance Limit
Molybdenum	Non-Parametric Tolerance Limit
Radium	Non-Parametric Tolerance Limit
Selenium	Non-Parametric Tolerance Limit
Thallium	Parametric Upper Tolerance Limit

As presented, the statistical test methods used for the 202 background concentration update evaluation of groundwater monitoring data at the Chesterfield Power Station FFCP Management Facility 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 statistical methods selected for the 2020 background concentration update are appropriate for evaluating the groundwater monitoring data for the CCR management area associated with the Fossil Fuel Combustion Products Management Facility 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.

GOLDER ASSOCIATES INC.

Ron DiFrancesco, P.E.

Principal and Practice Leader