

**Statistical Method Certification [40 CFR §257.93(f)(6)]
Chesterfield Power Station, Fossil Fuel Combustion Products (FFCP) Management Facility, Permit
No. 609**

EPA's "Disposal of Coal Combustion Residuals from Electric Utilities" Final Rule, 40 CFR §257.93(f)(6), requires the owner or operator of a 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 used for the *2023 Updated Facility Background Determination Report* (FBDR) at Virginia Electric and Power Company's Chesterfield Power Station, FFCP Management Facility, Solid Waste Permit No. 609.

Statistical Methods

The selected statistical methods for evaluating the groundwater monitoring data for the monitoring wells downgradient of MW-1S, MW-2, and MW-16 at Chesterfield Power Station were selected 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/parameter in Appendix III and IV of the CCR Rule as well as additionally required Department of Environmental Quality (DEQ) constituents are presented in the following table.

Statistical Methods Selected for CPS FFCP Management Facility (MW 1S, MW 2, MW 16)	
Parameter/Constituent	Statistical Method
Boron	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
Fluoride	Non-Parametric Tolerance Limit
pH	Parametric Upper and Lower Tolerance Limits
Sulfate	Non-Parametric Tolerance Limit
Total Dissolved Solids	Non-Parametric Tolerance Limit
Antimony	Non-Parametric Tolerance Limit (DQR)
Arsenic	Upper Tolerance Limit
Barium	Non-Parametric Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit
Chromium	Non-Parametric Tolerance Limit

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Statistical Methods Selected for CPS FFCP Management Facility (MW 1S, MW 2, MW 16)	
Parameter/Constituent	Statistical Method
Cobalt	Non-Parametric Tolerance Limit
Lead	Upper Tolerance Limit
Lithium	Non-Parametric Tolerance Limit
Mercury	Non-Parametric Tolerance Limit (DQR)
Molybdenum	Non-Parametric Tolerance Limit (DQR)
Radium	Non-Parametric Tolerance Limit
Selenium	Non-Parametric Tolerance Limit
Thallium	Non-Parametric Tolerance Limit

DQR – Double Quantification Rule

The selected statistical methods for evaluating the groundwater monitoring data for the monitoring wells downgradient of MW-1S and MW-2 only at Chesterfield Power Station were selected in accordance with 40 CFR §257.93(f) using methodologies presented in the Unified Guidance. The statistical methods selected for each constituent/parameter in Appendix III and IV of the CCR Rule as well as additionally required DEQ constituents are presented in the following table.

Statistical Methods Selected for CPS FFCP Management Facility (MW 1S, MW 2 only)	
Parameter/Constituent	Statistical Method
Boron	Non-Parametric Tolerance Limit
Calcium	Upper Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
Fluoride	Non-Parametric Tolerance Limit
pH	Parametric Upper and Lower Tolerance Limits
Sulfate	Non-Parametric Tolerance Limit
Total Dissolved Solids	Non-Parametric Tolerance Limit
Antimony	Non-Parametric Tolerance Limit (DQR)
Arsenic	Upper Tolerance Limit
Barium	Non-Parametric Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit
Chromium	Non-Parametric Tolerance Limit

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Statistical Methods Selected for CPS FFCP Management Facility (MW 1S, MW 2 only)	
Parameter/Constituent	Statistical Method
Cobalt	Upper Tolerance Limit
Lead	Non-Parametric Tolerance Limit
Lithium	Non-Parametric Tolerance Limit
Mercury	Non-Parametric Tolerance Limit (DQR)
Molybdenum	Non-Parametric Tolerance Limit (DQR)
Radium	Upper Tolerance Limit
Selenium	Non-Parametric Tolerance Limit
Thallium	Non-Parametric Tolerance Limit (DQR)

DQR – Double Quantification Rule

As presented, the statistical test methods used for the 2023 evaluation of groundwater monitoring data at the Chesterfield Power Station are based on tolerance limit methods. Inter-well 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 are used to calculate an upper Tolerance Limit (TL) for each parameter/constituent. The background dataset for each constituent/parameter was first tested for the presence of outliers. Extreme values identified during outlier testing were evaluated and removed from the dataset if warranted. The background datasets for each constituent/parameter were then tested for normality. The selected statistical method for each constituent/parameter is based on the results of normality testing. For constituent/parameter datasets that exhibited a normal or log-normal distribution, parametric statistical procedures have been selected. For constituent/parameter datasets that exhibited a non-normal distribution, non-parametric statistical procedures have been selected. Constituent/parameter datasets with 100 percent non-detects will use the Double Quantification Rule (DQR) in accordance with the Unified Guidance. A confirmed compliance well exceedance is determined if any compliance well with 100 percent non-detect data exhibits quantified measurements (*i.e.*, at or above the reporting limit) in two (2) consecutive sample events.

Further details regarding the statistical methods used to evaluate the groundwater monitoring data are presented in the Unified Guidance, the 2023 FBDR, and the groundwater monitoring plan prepared for the Landfill.

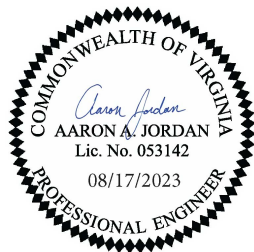
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CERTIFICATION

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.

WSP USA INC.



Aaron Jordan, P.E.
Assistant Vice President