

ENGINEER CERTIFICATION

Statistical Method Certification [40 CFR §257.93(f)(6)] Clover Power Station – Sludge Sedimentation Basins Clover, 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 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 at Virginia Electric and Power Company’s Clover Power Station Sludge Sedimentation Basins for the 2021 background concentration evaluation update. This certification has been updated from the March 2021 edition based on comments received from the Department of Environmental Quality (DEQ) in a letter dated June 15, 2021, and subsequent discussions with the DEQ.

Statistical Methods

The selected statistical methods for evaluating the groundwater monitoring data for the Clover Power Station (Sludge Sedimentation Basins) 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/parameter in Appendix III and IV of the CCR Rule are presented in the table below.

Statistical Methods Selected for Clover Power Station (Sludge Sedimentation Basins)	
Parameter/Constituent	Statistical Method
Antimony	Non-Parametric Tolerance Limit (DQR)
Arsenic	Non-Parametric Tolerance Limit
Barium	Parametric Upper Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit
Boron	Non-Parametric Tolerance Limit
Cadmium	Non-Parametric Tolerance Limit (DQR)
Calcium	Parametric Upper Tolerance Limit

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Statistical Methods Selected for Clover Power Station (Sludge Sedimentation Basins)	
Chloride	Parametric Upper Tolerance Limit
Chromium	Parametric Upper Tolerance Limit
Cobalt	Non-Parametric Tolerance Limit
Fluoride	Parametric 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)
pH	Non-Parametric Upper and Lower Tolerance Limits
Radium	Non-Parametric Tolerance Limit
Selenium	Non-Parametric Tolerance Limit (DQR)
Sulfate	Parametric Upper Tolerance Limit
Thallium	Non-Parametric Tolerance Limit (DQR)
Total Dissolved Solids	Parametric Upper Tolerance Limit

DQR – Double Quantification Rule

As presented, the statistical test methods used for the 2021 biennial evaluation of groundwater monitoring data at the Clover Power Station (Sludge Sedimentation Basins) 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 is used to calculate an upper Tolerance Limit (TL) for each parameter/constituent. The background data set 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

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quantified measurements (*i.e.*, at or above the reporting limit) in two (2) consecutive semi-annual compliance sampling events.

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

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.

GOLDER ASSOCIATES INC.



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