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Statistical Method Certification [40 CFR §257.93(f)(6)]
Clover Power Station – Stage III
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 Stage III Landfill, Solid Waste Permit No. 556.

Statistical Methods

The selected statistical methods for evaluating the groundwater monitoring data for the Clover Power Station (Stage III) 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 and the inorganic constituents from VSWMR Table 3.1 are presented in the table below.

Statistical Methods Selected for Clover Power Station (Stage III)	
Parameter/Constituent	**Statistical Method**
Antimony	Non-Parametric Tolerance Limit (DQR)
Arsenic	Non-Parametric Tolerance Limit
Barium	Non-Parametric Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit
Boron	Non-Parametric Tolerance Limit (DQR)
Cadmium	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
Chromium	Parametric Upper Tolerance Limit
Cobalt	Non-Parametric Tolerance Limit

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Statistical Methods Selected for Clover Power Station (Stage III)	
Copper	Non-Parametric Tolerance Limit
Cyanide	Non-Parametric Tolerance Limit
Fluoride	Non-Parametric Tolerance Limit
Hexavalent Chromium	Upper Tolerance Limit
Lead	Non-Parametric Tolerance Limit
Lithium	Parametric Upper Tolerance Limit
Mercury	Non-Parametric Tolerance Limit (DQR)
Molybdenum	Non-Parametric Tolerance Limit (DQR)
Nickel	Non-Parametric Tolerance Limit
pH	Non-Parametric Upper and Lower Tolerance Limits
Radium	Non-Parametric Tolerance Limit
Selenium	Non-Parametric Tolerance Limit
Silver	Non-Parametric Tolerance Limit
Sulfate	Non-Parametric Tolerance Limit
Sulfide	Non-Parametric Tolerance Limit
Thallium	Non-Parametric Tolerance Limit (DQR)
Tin	Non-Parametric Tolerance Limit
Total Dissolved Solids	Parametric Upper Tolerance Limit
Vanadium	Non-Parametric Tolerance Limit
Zinc	Non-Parametric Tolerance Limit

DQR – Double Quantification Rule

As presented, the statistical test methods used for the 2021 initial evaluation of groundwater monitoring data at the Clover Power Station (Stage III) 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

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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 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 and the groundwater monitoring plan prepared for the Landfill.

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 USA INC.

Ron DiFrancesco, P.E.

Principal and Practice Leader