



2020 Statistical Method Certification (40 CFR §257.93(f)(6))
Clover Power Station – Stage III Landfill
Solid Waste Permit #556
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 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 Clover Power Station 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 Landfill 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 Clover Power Station Stage III Landfill	
Parameter/Constituent	Statistical Method (2020 Update)
Boron	Non-Parametric Tolerance Limit
Calcium	Non-Parametric Tolerance Limit
Chloride	Non-Parametric Tolerance Limit
pH	Two-Tailed Parametric Upper Prediction Limit
Sulfate	Non-Parametric Tolerance Limit
Total Dissolved Solids	Parametric Upper Prediction Limit
Fluoride	Non-Parametric Tolerance Limit
Antimony	Non-Parametric Tolerance Limit
Arsenic	Non-Parametric Tolerance Limit
Barium	Non-Parametric Tolerance Limit
Beryllium	Non-Parametric Tolerance Limit

Statistical Methods Selected for Clover Power Station Stage III Landfill	
Parameter/Constituent	Statistical Method (2020 Update)
Cadmium	Non-Parametric Tolerance Limit
Chromium	Non-Parametric Tolerance 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	Non-Parametric Tolerance Limit

As presented, the statistical test methods used for the 2020 update evaluation of groundwater monitoring data at the Clover Power Station Stage III Landfill 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 the 2020 update evaluation of groundwater monitoring data for the CCR management area at the Clover Power Station Stage III Landfill, Solid Waste Permit No. 556, 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

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