



South Carolina Department of Health
and Environmental Control

INSTRUCTIONS- STATISTICAL ANALYSIS FOR RANDOM AND STRATIFIED SAMPLE ANALYSIS – DHEC 3782 FORM

INTRODUCTION

Instructions to determine if the proper number of samples were analyzed by entering the results of each waste stream into the Preliminary and/or Revised Estimates found in SW846, Chapter Nine for Simple and Stratified Sampling.

METHOD

Below are the Instructions for the Preliminary and/or Revised Estimates for Random and/or Stratified Statistical Review necessary to determine the proper number of samples required for an accurate representative regulatory waste status determination of a waste stream or contaminate. The more popular of the two is the Random Sampling. **Prior to collecting samples**, everyone should recognize there are at least four scenarios to understand before actually collecting samples. Otherwise, considerable time and money could be lost.

1) Zero additional samples are required if the INPUT number of samples are greater than the required number of Samples (i.e. calculated by the equation for the number of samples per the “Preliminary Estimates”).

2) The required number of samples calculated by the equation (Preliminary number of samples) may only be one or two more samples than those collected during the sampling event (usually we require a minimum of two samples). It is a good idea to have collected a few more samples to overcome any possibility of poor estimates by the statistical equation (for the number of sample). Poor estimates are usually exhibited by a wide difference between the two initial input values for the two samples analytical results (i.e. two minimum samples required by Solid Waste Landfill Regulation 107.19).

3) Based on the preliminary results for the number of samples, a new sample collection may be required to collect additional samples. Also, the “Revised Estimates” Equations may be necessary in lieu of the “Preliminary Estimates.” For example, if the preliminary estimates required 5 to 30 additional samples, a new sampling event must be initiated to collect the additional 5 to 30 samples from the waste stream in question. These 5 to 30 values must be input values entered in to “Revised Estimates” found on the lower portion of the Random Sampling page.

4) Historical Data Values, from previously collected samples, may be used in the Preliminary Estimates to determine the proper number of samples necessary to

make an accurate waste status determination. This use of Historical Data Values may be accomplished prior to any sampling event.

Preliminary Estimates- Initial Number of Samples per Waste Stream:

- 1) INPUT the name of the Chemical Compound in the cell adjacent to “Chemical Concentration of:”
- 2) INPUT the Regulatory Threshold Levels in the “RT Value Cell.” Note that the “RT” can be a Regulatory Threshold such as hazardous or non-hazardous, or a value that is based on protection of human health and the environment.
- 3) Type the analytical results (concentrations) for each analyte (chemical compound or element) into the “INPUT” Cells on the Spreadsheet of choice (i.e. such as Simple Random Sampling).
- 4) Note that Blank Cells are to be left Blank; otherwise the calculations will be incorrect.
- 5) The Values for the “Mean,” “Variance,” and “Number of Samples” will be displayed once values are entered.

Revised Estimates- Based on the fact that additional samples were required from the “Preliminary Estimates”:

- 1) INPUT the analytical results the same way as mentioned for the “Preliminary Estimates.”
- 2) The OUTPUT will be the “Mean,” “Variance,” “Std. Dev.,” “Std. Error,” “Conf. Interval Upper Limit,” “Conf. Interval Lower Limit,” and the additional number of samples required.
- 3) The Mean is compared to the “RT,” and if greater than the “RT” then “Hazardous,” “Study is Complete” will appear. If the “Mean” is less than the “RT,” then the equations will relate the “Upper Conf. Limit” with the “RT.” If the “RT” is exceeded, then an additional number of samples will appear. These are the number of additional samples required to prove the waste non-hazardous, or not a detriment to human health and the environment.

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