

Appendix A

Statistical Procedure

The statistical procedure in this appendix shall be used to determine the 80% upper confidence intervals for the mean concentrations of waste characterization parameters, as required by paragraph (E) of this rule, for the test results obtained in accordance with paragraph (D) of this rule. For any set of concentration values for a parameter from independent samples of waste, the 80% upper confidence interval (CI) for the mean is as follows:

$$CI = \bar{X} + t_{.80} S_{\bar{X}}$$

Where: \bar{X} = arithmetic mean of the concentration of the parameter,
 $t_{.80}$ = "t" value taken from the table below,
 $S_{\bar{X}}$ = estimate of the standard error of the mean of the concentration of the parameter, calculated as follows:

$$S_{\bar{X}} = \frac{s}{\sqrt{n}}$$

Where: n = total number of samples of a waste analyzed for the parameter.
 s = estimate of the population standard deviation of the concentration of the parameter in a waste, calculated as follows:

$$s = \sqrt{\frac{\sum_{i=1}^n x_i^2}{n-1}}$$

Where: x_i = concentration of the parameter determined for one sample of a waste.

Tabulated Values of Student's "t_{.80}"

Degrees of Freedom (n-1)*	Tabulated "t _{.80} " value**	Degrees of Freedom (n-1)*	Tabulated "t _{.80} " value**	Degrees of Freedom (n-1)*	Tabulated "t _{.80} " value**
6	1.440	11	1.363	16	1.337
7	1.415	12	1.356	17	1.333
8	1.397	13	1.350	18	1.330
9	1.383	14	1.345	19	1.328
10	1.372	15	1.341	20	1.325

* Degrees of freedom are equal to one less than the number of samples (n) tested for a waste.

** Tabulated "t" values are for a two-tailed confidence interval and a probability of 0.80 for the population mean being within the confidence interval. Additional degrees of freedom and associated "t" values can be found in standard statistical manuals when calculating the upper confidence limit with more than seven samples.

The sample concentration data may be assumed to be normally distributed and may be used directly in determining the confidence interval. The upper limit of the confidence interval is compared with the applicable class limits in Appendix A to Chapter 3745-30-04 of the Administrative Code. The upper limit of the confidence interval shall be less than or equal to the applicable class limit.