

US EPA ARCHIVE DOCUMENT

November 11, 1997

MEMORANDUM

TO: Nick Vizzone, EPA

THROUGH: Mary Wolfe, SAIC

CC: Anita Cummings and Elaine Eby, EPA

FROM: Howard Finkel, ICF

SUBJECT: Calculation of Universal Treatment Standard (UTS) for Beryllium Using Data Submitted by Brush Wellman and Data Obtained From Rollins

The purpose of this memorandum is to document the calculation of a revised UTS for beryllium using (1) the data submitted by Brush Wellman (BW) and (2) the combination of the BW data with the initial data obtained from Rollins Environmental.

EVALUATION OF BW'S DATA

I followed the methodology presented in "Final Best Demonstrated Available Technology (BDAT) Background Document For Quality Assurance/Quality Control Procedures and Methodology," dated October 23, 1991 to evaluate the data submitted by BW's attorney in a letter to Anita Cummings dated November 3, 1997. As instructed by Elaine Eby, I only analyzed the data characterizing the rotary filter sludge that had been stabilized using cement kiln dust.

After entering the data into an Excel spreadsheet, I used the Z-score test, as described in Attachment A-1 of the background document, to remove any values that fell outside of the -2.0 to +2.0 range. Based on the Z-score outlier test, none of the reported values were determined to be outliers. Attachment 1 presents a summary of both the raw data and the Z-score analysis.

I then used the BDAT methodology to calculate the variability factor and treatment standard. Specifically, I followed Appendix D - Variability Factor to estimate the daily maximum

variability factor using BW's data. Following this procedure, I used equation [1], on page D-1 to calculate VF:

$$VF = \frac{C_{99}}{Mean}$$

Where:

$$C_{99} = EXP (y + 2.33 * Sy)$$

- y = the mean of the logtransformed (natural log) data
- Sy = the standard deviation of the logtransformed (natural log) data
- Mean = the average of the individual performance values.

The treatment standard for beryllium was then calculated by taking the product of the variability factor and mean constituent concentration. Attachment 2 presents both the variability factor and treatment standard calculated using BW's data.¹

EVALUATION OF BW'S AND ROLLINS ENVIRONMENTAL'S DATA

I combined the TCLP data submitted by BW with the data obtained from Rollins Environmental that were previously evaluated. (This previously constructed data set already had the samples that either did not have influent TCLP concentrations or had effluent TCLP concentrations in excess of the influent TCLP concentrations removed from the population.) I then used the Z-score test, as described in Attachment A-1 of the background document, to remove any values that fell outside of the -2.0 to +2.0 range. Based on the Z-score outlier test, none of the samples were determined to be outliers. Attachment 3 presents a summary of the Z-score analysis for the combined data set.

I then used the BDAT methodology to calculate the variability factor and treatment standard for the combined data set. Attachment 4 presents both the variability factor and treatment standard calculated using both BW's and Rollins Environmental's data.

For your convenience, I have summarized the revised UTS levels calculated for beryllium below in Exhibit 1.

¹ I note that all of the BW data points exhibited treated TCLP concentrations for beryllium that were significantly lower than those concentrations exhibited by the untreated wastes samples.

EXHIBIT 1

**SUMMARY OF REVISED UTS LEVELS FOR BERYLLIUM
(SOME VALUES HAVE BEEN ROUNDED)**

	Proposed	BW	BW & Rollins Env.
Mean of TCLP Data	NA	0.19	0.12
Variability Factor:	NA	6.47	25.58
Treatment Standard:	0.02	1.22	3.12

NA: Values were based on HTMR analysis performed by another contractor.

If you have any questions regarding the attached analyses, please call me at (703) 934-3656.

attachments

ATTACHMENT 1

ATTACHMENT 2

ATTACHMENT 3

ATTACHMENT 4

