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OU #2 TREATABILITY STUDY REPORT

08-17-92

USEPA/DOE-FN

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LETTER



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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REPLY TO THE ATTENTION OF:

Mr. Jack R. Craig
United States Department of Energy
Feed Materials Production Center
P.O. Box 398705
Cincinnati, Ohio 45239-8705

HRE-8J

RE: OU #2 Treatability Study
Report

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Operable Unit #2 Treatability Study Report. This Report contains several inconsistencies and requires revision before it can be approved by U.S. EPA.

U.S. EPA hereby disapproves the Report pending incorporation of the enclosed comments.

Please contact me at (312/FTS) 886-0992 if you have any questions.

Sincerely,

James A. Saric
Remedial Project Manager

Enclosure

cc: Graham Mitchell, OEPA-SWDO
Pat Whitfield, U.S. DOE-HDQ
Dennis Carr, WMCO

AUG 26 1992

ATTACHMENT

DRAFT TREATABILITY STUDY REPORT FOR OPERABLE UNIT 2

TECHNICAL REVIEW COMMENTS

GENERAL COMMENTS

1. The report, as well as the data contained in it, is presented in a manner that is very hard to understand and follow, partly because of the large amount of data collected during the study and partly because of the manner in which the data is presented in the report. Many apparent inconsistencies exist between tables and between tables and text. Also, see specific comments below. For example, Tables 4-17 through 4-21 present data that compares the 95 percent upper confidence limits (UCL) to toxicity characteristic (TC) criteria. However, the text only includes a discussion comparing individual sample results to TC criteria. The tables should present easily understandable and accurate summaries of the data and the text should describe the data in the tables.
2. The treatability study report indicates that all treated waste samples appear to meet preestablished TC criteria. However, all untreated samples also apparently meet TC criteria. This finding should be discussed in the report.
3. In Tables 4-23 through 4-32, more analytes were apparently present in treated waste samples than in untreated samples. Some analytes were found at higher concentrations in the treated than untreated waste samples. The significance of this finding should be specifically discussed in the discussion or conclusions.

Also, the treatability study report states (on page 2-1) that the increase in volume resulting from cement stabilization was substantial. The report should explain whether or not dilution of the treated waste

samples by reagent addition was taken into account when percent reductions were calculated for Tables 4-29 through 4-32 and 4-38 and 4-39 (see Specific Comment No. 20).

4. The report presents modified TCLP results and TCLP results. The report should discuss whether or not an attempt was made to compare the modified TCLP results with the TCLP results.
5. The data presented in the tables and appendices in Section 4 are suspect. First, some data have the wrong measurement units (see Specific Comment No. 24). Second, the U.S. Department of Energy (DOE) apparently did not follow the methods presented in this report for statistically reducing data. The report states on page 4-12, line 29, that data reported as nondetected would be assigned a value equal to the sample quantitation limit (SQL) when calculating the UCL and lower confidence limit (LCL). However, this procedure does not appear to have been used. For example, Table A-9 reports a frequency of detection for arsenic of 1/1. However, Table A-2 indicates that arsenic was analyzed for twelve times. Table A-9 presents statistics for the only sample that was detected. The treatability study report should clearly state the methods used to calculate the UCL and LCL, and the methods should be followed. In addition, the data in the appendices should be reviewed to ensure its accuracy.

SPECIFIC COMMENTS

1. Section 1.2, Page 1-7, Lines 17 to 20. The chemicals and waste areas of Operable Unit 2 presented in Table 1-1 on pages 1-8 through 1-11 should all be included in Appendix A, but are not. For example, the treatability study report states that Table A-1 contains the TCLP radiological results. This table is not included in Appendix A.
2. Section 2.1, Page 2-1, Line 12. This line discusses contaminants of "current or proposed potential concern." The meaning of "current or proposed potential concern" should be explained.

3. Section 2.1, Page 2-1, Line 13. This section presents conclusions concerning beryllium. However, beryllium is not discussed in Section 4 (Results and Discussion). A discussion of the analytical results for beryllium should be included in Section 4.
4. Section 2.1, Page 2-1, Line 15. The treatability study report states that certain metals that exceeded TC limits were effectively treated through stabilization. However, Tables A-2 and A-4 to A-6 in Appendix A (Untreated Waste Analytical Results) do not contain any results that exceed the TC limits. The reference to untreated wastes exceeding TC limits should be removed or explained.
5. Section 3.1.3.1, Page 3-11, Lines 7 to 8. It is not clear why ~~residue~~ and metallic fragments were removed prior to ashing. The report should discuss whether or not these materials will also be removed if stabilization is the chosen remedy for the solid waste landfill.
6. Section 3.8.2, page 3-41, lines 9 to 12. During the treatability study, DOE evaluated the unconfined compressive strength (UCS) of several samples after a 90-day period. The report should discuss the basis for choosing a 90-day period. The report should also discuss why DOE believes a 90-day period is long enough to assess the long-term detrimental effects of sulfate on a stabilized waste matrix that is expected to maintain its integrity for many years.
7. Section 3.6.3, Page 3-41, Line 15. In Section 3.1.3.2, the treatability study report states that leachability testing conducted during the treatability study will be used for evaluating overall protection of human health and the environment and compliance with applicable or relevant and appropriate regulations in the feasibility study. However, the report also states that U.S. Environmental Protection Agency (EPA) has specified new preliminary remediation goals (PRG) that are not based on leachate concentrations. Because DOE has not demonstrated that the stabilization technology can meet these new PRGs, Section 2.2

(Conclusions and Recommendations) should contain a recommendation that additional testing of the stabilized waste be conducted to ensure that stabilization can meet the PRGs and is protective of human health and the environment.

8. Section 4, Table 4-3, page 4-3. The value for the minimum percent clinoptilolite should be added to this table.
9. Section 4.1.1.8, Page 4-12, Line 29. The treatability study report assigns data reported as nondetected a value equal to the SQL when calculating the UCL and LCL. DOE should provide a rationale for assigning these values. As stated in Section 4.1.1.7, EPA recommends assigning a value equal to one-half the SQL for risk assessments. This value may also be appropriate when calculating the UCL and LCL. The report should also discuss how qualified data were used when calculating UCLs and LCLs.
10. Section 4.1.1, Page 4-14, Line 22. The treatability study report states that untreated waste from all three areas met or exceeded TC regulatory limits. As stated in Specific Comment No. 5, no wastes exceeded TC limits. This statement should be removed from the report or explained.
11. Table 4-16, Page 4-21. No data are reported in this table. The data should be added.
12. Section 4.1.2.1, Page 4-22, Line 31. The treatability study report presents tables that compare the percentage of the UCL concentrations of constituents of concern to the TC and leachate action levels. However, the report does not discuss these data. The significance of these data, especially UCL data that exceed the TC and leachate action levels, should be discussed.
13. Table 4-17, Page 4-23. Table D-2 in Appendix D indicates that the beryllium concentration in the leachate of treated samples from the solid waste landfill exceeds the 10^{-6} leachate action level. Table 4-17

should indicate this result and the beryllium concentrations should be discussed in text.

14. Table 4-21, Page 4-27. The footnote in this table indicates that the UCL for one constituent, silver, was calculated both with and without outliers. The procedure for determining outliers should be given. The text should also note that the data reported for silver concentrations in samples taken from the South Field (see Specific Comment No. 24) were reported using incorrect units.
15. Section 4.1.2.1, Page 4-29, Lines 19 to 23 and Tables 4-23 to 4-32. Tetrachloroethene and lead in the solid waste landfill were detected in the characterization (untreated waste) samples, but not in the treated waste samples. These two analytes should also be included in Table 4-29. Conversely, analytes detected in the treated waste samples but not in the characterization samples should also be included in Tables 4-29 to 4-32 and 4-38 and 4-39. In addition, the text should discuss the significance of these findings.
16. Section 4, Page 4-29, Lines 23 to 24. The report states that differences in leachate concentrations of several constituents before and after stabilization are probably due to sample heterogeneity. Evidence to support this conclusion should be included in the treatability study report.
17. Table 4-23, Page 4-30. The median values presented for benzoic acid, phenol, and toluene and the mean values for benzoic acid and toluene are greater than the maximum values. This is not possible because, by definition, the median value is the middle value in a sample population and the mean value is equal to the sum of all the values divided by the number of samples. The median and mean values should be corrected.
18. Table 4-26, Page 4-33. The table should either clarify why each contaminant detected is listed twice, or list each contaminant only

once. Also, the median and mean values for toluene exceed the maximum value presented. The median and mean values should be corrected.

19. Tables 4-29 to 4-32 and 4-38 and 4-39, Pages 4-36 to 4-39 and 4-46 and 4-47. The report does not indicate whether or not the addition of reagents and additives, which result in a mass increase, is corrected for when the median percent reduction of contaminants is calculated. This information should be included in the report.
20. Table 4-29 to Table 4-32, Pages 4-36 to 4-39. These tables report a "median percent reduction." This term should be defined.
21. Table 4-33, Page 4-40. The median and mean values for total uranium exceed the maximum value presented for total uranium. The median and mean values should be corrected.
22. Section 4.1.2.3, Page 4-58, Lines 15 and 16. The treatability study report states that UCS and bulking factor are the parameters used to determine the recommended formulation of stabilizing agents. Because cost is a feasibility study criterion, cost should also be considered when determining the recommended formulation of binding agents. Fly ash may be cheaper to use for stabilization than cement because fly ash is readily available on site.
23. Appendix A, Table A-2. The units for the analytical data reported for Fernald Environmental Management Project (FEMP) Samples No. 067016, 067021, 067025, 061319, 061324, 061329, 061334, 067335, 067360, 067361, and 067362 taken from the Inactive Flyash Pile and South Field appear to be wrong. The detection limits for inorganic analytes are approximately three orders of magnitude less than the detection limits listed in Table C-2. The units apparently should be milligrams per liter. This table, as well as other tables that cite data from this table, should be corrected.

24. Appendix A, Table A-6. The title for this table is "Fernald Environmental Management Project Pesticide/PCB Data"; however, the table does not present any polychlorinated biphenyl (PCB) data. These data should be included in the table.
25. Appendix B, Table B-1, Data Information (Part 2 of 2). The report should explain why information and dates are missing in this table.
26. Appendix D, Table D-1, Page 4. An error exists in the risk-based action levels for 1,1-dichloroethene. The limits presented for the 10^6 and 10^8 action levels should differ by a factor of 10. However, the table presents values that differ by a factor of 6. This error should be corrected.