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# DISAPPROVAL OF THE REVISED OU #4 VITRIFICATION TREATABILITY STUDY WORK PLAN

03/05/92

USEPA/DOE-FN
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LETTER

U-006-707.19

UNITED STATES ENVIRONMENTAL
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REPLY TO THE ATTENTION OF:

HRE-8J

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

RE: Disapproval of the Revised
OU #4 Vitrification
Treatability Study Work Plan

Dear Mr. Craig:

The United States Environmental Protection Agency (U.S. EPA) has completed its review of the Revised Operable Unit #4 Vitrification Treatability Study Work Plan. The revised Work Plan failed to include testing and analytical methods, and failed to adequately respond to U.S. EPA's comments.

Therefore, U.S. EPA again disapproves the Work Plan pending incorporation of the attached comments, and submission of the necessary testing and analytical methods.

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

(allen)
partial
action
response
to t-0719
(3877)



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ATTACHMENT

FINAL DRAFT OPERABLE UNIT 4 TREATABILITY STUDY WORK PLAN FOR THE [redacted] VITRIFICATION OF RESIDUES FROM SILOS 1, 2, AND 3 AT FEMP

TECHNICAL REVIEW COMMENTS

## GENERAL COMMENTS

1. During the teleconference, DOE proposed to reduce the sample volume to be used during the treatability study. EPA has two concerns regarding DOE's proposal to reduce the amount of waste to be vitrified during the treatability studies. First, DOE should document that enough treated waste sample will be available for analysis, including sample volume required for quality assurance and quality control sampling analyses. Second, the decrease in sample volume will increase surface to volume ratio of the waste, which will likely increase radon emanation flux and cause an overestimation of expected radon emanation flux during actual full-scale operation. DOE should describe how the treatability test results will be interpreted if the treatability test does not simulate actual radon emanation flux expected during full-scale operation.

## SPECIFIC COMMENTS

1. **DOE response to EPA General Comment No. 5.** Testing and analytical methods are not included in the treatability study work plan and still need to be reviewed before the work plan can be approved.

2. **Response to EPA General Comment No. 8.** It may be difficult to arrive at any definite conclusions concerning the effectiveness of vitrification without analyzing untreated waste samples used in the treatability study. Table C-6 shows a large range in extraction procedure (EP) toxicity levels, especially for lead. During the teleconference, DOE indicated that samples of raw waste from discrete sections of Silos 1 and 2 are currently being analyzed using the toxicity characteristic leaching procedure (TCLP). The samples of raw waste will be composited from each of the A, B, and C horizons and used during the treatability study. The work plan should describe how the TCLP data from samples obtained from the discrete sections will be used to compute the TCLP values of composited untreated waste used in the treatability study.

3. **Response to EPA Specific Comment No. 3.** This comment has not been addressed. Section 4.2, page 31, line 3 states that the bench-scale tests are designed to verify whether or not the alternatives that include vitrification can meet the performance goals established by applicable or relevant and appropriate requirements (ARAR). In addition, compliance with ARARs is an evaluation criteria in the feasibility study (FS) process. Therefore, the treatability study work plan should clearly identify which ARARs will be evaluated during

treatability testing, and which ARARs will be evaluated using other sources of information, such as available literature on and operating data from existing vitrification systems.

4. **Response to EPA Specific Comment No. 6.** The fact that vitrification has been identified as a Best Demonstrated Available Technology (BDAT) does not guarantee the long-term stability of vitrified wastes at FEMP. Long-term effectiveness is an FS evaluation criteria and should be evaluated before remedy selection. Available data (such as the BDAT data) from the vitrification of high-level radioactive wastes may be satisfactory for comparing vitrification to other alternatives in the FS if wastes previously vitrified are physically and chemically similar to the wastes in Silos 1, 2, and 3. If wastes in the silos are not similar, weathering and durability tests should be conducted. If additional weathering and durability testing is required, treatability testing methods may need to be modified because of the large amount of treated sample required to perform physical tests such as wet/dry weathering tests, freeze/thaw weathering tests, and other tests recommended in Ohio Environmental Protection Agency (OEPA) General Comment No. 2.

5. **Response to EPA Specific Comment No. 15.** The treatability study work plan states that sodium hydroxide will be added as a glass-forming reagent. Sodium hydroxide is not a glass-forming reagent, but is usually added to increase the electric conductivity of molten waste. Silica and/or aluminum should be added if glass-forming reagents are required.

6. **Response to OEPA Specific Comment No. 40.** Power consumption is important in determining the feasibility of vitrification from a cost effectiveness standpoint. Because cost is an FS evaluation criteria, measuring power consumption during treatability testing may be appropriate. Alternately, DOE may use actual operating data from the Savannah River or Hanford vitrification plants when estimating power consumption costs. However, DOE should state how power consumption costs will be estimated for the FS.