

2252

**RESPONSE TO COMMENTS TREATABILITY
STUDY WORK PLAN FOR OPERABLE UNIT 4
JULY 1991 OCTOBER 1991**

10-1-91

**50
RESPONSE**

RESPONSE TO COMMENTS
TREATABILITY STUDY WORK PLAN
FOR
OPERABLE UNIT 4
JULY 1991

OCTOBER 1991

OHIO EPA COMMENTS CONCERNING:
THE TREATABILITY STUDY WORK PLAN FOR OPERABLE UNIT 4

General Comments

Commenting Organization: OEPA		Commentor:
Pg. #	Section #	Sent./Line #
General Comment #1	Paragraph #	

Comment: The work plan should indicate that the treatability study will be conducted to comply with 40 CFR 261.4(e) and (f) and Ohio Administrative Code 3745-51-04(E) and (F).

Response: Agreed. The text will be revised to state the treatability study will be conducted in accordance with 40 CFR 261.4(e) and (f) and the GAC 3745-51-04(e) and (f).

Action: Text has been revised.

Commenting Organization:		Commentor:
Pg. #	Section #	Sent./Line #
General Comment #2	Paragraph #	

Comment: Following the EPA's "Guide for Conducting Treatability Studies under CERCLA", the following sections are missing or omitted.

a) **Goals** - Goals for the treatability study should be clearly defined within the first chapter. Goals should be measurable aspects of the treatability study. As stated in the "Guide for Conducting Treatability Studies under CERCLA" (Section 2.1.3), "Setting goals for the treatability study is critical to the ultimate usefulness of the data generated." Goals should include disposal requirements, potential cleanup levels, and the reduction of toxicity, mobility and volume.

b) **Schedule** - Since schedules were recently negotiated with USEPA, a detailed schedule for the treatability study should be available and incorporated into the document.

Response: a) DOE agrees with the statement that the goals should be clearly defined in the first chapter and that the goals should be measurable aspects of the study. In this case, goals in the form of action levels have not yet been established for the RI/FS, nor for any individual operable unit; however, the preliminary remediation goals have been determined for uranium and other radionuclides and will be provided in the third chapter. These risk-based goals will be utilized in evaluating disposal requirements and the reduction of toxicity, mobility, or volume.

b) Agree.

Action: Revise text in Section 3.0 documenting the 1E-06 risk levels for radionuclides.
A schedule has been incorporated into a new Section 13.0 in the Work Plan.

Commenting Organization:		Commentor:
Pg. #	Section #	Sent./Line #
General Comment #3	Paragraph #	

Comment: Contamination within the berms and silo walls is likely, but is not specifically addressed in any of the removal alternatives. How will the treatment/disposal of these soils/structures be addressed?

Response: While some contamination of the silo structure and berms is likely, it is expected to be at low levels so that no treatment will be required. The untreated silo rubble and berms will be placed into suitable containers and disposed of either at an approved off-site facility or in the EWMF. If contamination of the berms and/or silo structures is higher than expected and require treatment, specific stabilization or vitrification formulations can be developed during remedy design testing.

Action: None required.

Commenting Organization:		Commentor:
Pg. #	Section #	Sent./Line #
General Comment #4	Paragraph #	

Comment: A primary contaminant of concern for the silos is radon, yet radon emissions are not confronted within this work plan. The work plan should address how radon emissions will be affected by the proposed treatment options. The following, at a minimum should be addressed: What level of radon would be released during actual remediation via the specific treatment option? How much radon will be emitted by the waste form following treatment? If this can not be directly measured, then can it be estimated via some other measure (i.e., pore size)?

Response: Radon is a constituent of concern for OU4. Radon emissions from the final waste form will be assessed in the revised work plan. Radon emissions during the treatment process will not be assessed because DOE believes that aspect of the treatability study must be performed under the remedial design phase of the FS.

Action: Radon emission testing in final waste form has been included in the advanced phase of the treatability work plan.

Commenting Organization: _____ Commentor: _____
 Pg. # Section # Paragraph # Sent./Line #
 General Comment #5

Comment: A number of analytical methods have been proposed within this work plan (MTCLP, Bulking Factor, etc.) Few if any of these refer to approved QAPP SOPs or ASTM methods. All new analytical methods should be incorporated into the revised site-wide QAPP to be submitted in September, 1991. Approved analytical methods are essential to using the data in risk assessments as well as assuring the quality of data in choosing remedial actions.

Response: These analytical methods will be explained in this Work Plan to the extent necessary for QA purposes. This Work Plan will then be incorporated into the RI/FS Work Plan through the normal design change request (DCR) process. This methodology will then achieve the objective of utilizing approved analytical methods for data incorporation into the risk assessment.

Action: These analytical methods will be explained in Appendices B and C of the Treatability Study Work Plan so that this plan can be incorporated in a timely fashion through the DCR process into the RI/FS Work Plan.

Specific Comments

Commenting Organization: OEPA Commentor:
 Pg. #1 Section #1.1 Paragraph # Sent./Line #14
 Original Comment #1

Comment: This sentence seems to indicate that waste is stored in the silo berms. Clarify this sentence.

Response: Revise to "...and for the adjoining silo berms."

Action: Text has been revised.

Commenting Organization: OEPA Commentor:
 Pg. #2 Section #1.1 Paragraph # Sent./Line #4
 Original Comment #2

Comment: Other radionuclides have been identified in the waste, including isotopes of uranium and thorium, radium 226, lead 210, and polonium 210. These are also nuclides of concern.

Response: Agreed. However, it was not the purpose of this paragraph to identify all the radionuclide of concern. These are identified in Table 1-1 and also in Section 3.0

Action: Text has been revised.

Commenting Organization: OEPA

Pg. # Section #1.2

Original Comment #3

Paragraph #

Commentor:

Sent./Line #

Comment: As has been pointed out to DOE in Ohio EPA comments on several previous documents, remedial action goals must meet a site-wide risk range of 10^{-6} to 10^{-4} excess lifetime cancer risk. Action levels are not determined by simply using twenty-five percent of standards (Table 1-1 & 1-2). This section should reference the methodology recently negotiated in the Amended Consent Decree between USEPA and DOE for ensuring the attainment of site-wide risk levels. The reasoning for inclusion of this section are unclear. If it is to be included in this work plan, it should be tied into setting goals for the treatability study (See general comment #2).

Response: Agree with comment.

Action: The table will be moved to the performance objectives section in Section 3.0 and will include the risk-based PRG's for the constituents of concern in OU4. The table will also contain other information which will aid in the experimental design and quantitative performance evaluation of the treated waste form.

Commenting Organization: OEPA

Pg. #6 Section #1.3.1

Original Comment #4

Paragraph #

Commentor:

Sent./Line #11

Comment: Reads: "The purpose of treatment is to render the material nonleachable so that it is not hazardous by characteristics under the Resource Conservation and Recovery Act." The purpose of the treatment should just not only be to render the material not hazardous, but also to permanently and significantly reduce the volume, toxicity, and mobility of the hazardous substances, pollutants and contaminants of the site (including the elimination of radionuclide leachability).

Response: The sentence in lines 11 through 13 will be deleted. The sentence in lines 9 through 11 will be revised as follows: "...can be effectively treated by reducing its volume, toxicity, or mobility."

Action: Text has been revised.

Commenting Organization: OEPA
Pg. #6 Section #1.3.1
Original Comment #5

Paragraph #

Commentor:
Sent./Line #14

Comment: It is inappropriate to cite a reference unavailable to the public or the reviewer. Either eliminate this reference or release the report, "Characteristics of Fernald's Silos 1 and 2 Residue Before, During and After Vitrification."

Response: Lines 14 through 19 will be replaced with the following: "Westinghouse is conducting vitrification tests on the Silos 1 and 2 materials. The stabilization tests in this work plan are required so that comparisons of vitrification and stabilization that will be made in the Feasibility Study and in subsequent engineering designs can be based on fact rather than on conjecture."

Action: Text has been revised.

Commenting Organization: OEPA
Pg. #6 Section #1.3.1
Original Comment #6

Paragraph #

Commentor:
Sent./Line #20-21

Comment: DOE should more clearly state what this sentence is suggesting. Are silo 3 wastes candidates for solvent extraction? Will the high concentrations of Th-230 and other radionuclides (i.e., Ac-227, Ra-228, Pa-231, U-235/236) in silo 3 affect the effectiveness of this process.

Response: The Silo 3 waste is not a candidate for solvent extraction. This material has a much higher content of aluminum, calcium, iron, and magnesium than the material in Silos 1 and 2. Since these would leach with the hazardous and radioactive metals, the expected volume reduction of Silo 3 material is not adequate to warrant this option. The sentence in lines 20 and 21 will be deleted.

Action: Text has been revised.

Commenting Organization: OEPA
Pg. #7 Section #1.3.2
Original Comment #7

Paragraph #

Commentor:
Sent./Line #11-13

Comment: There is a mention of "original interpretation" of the U.S. EPA "Guide for Conducting Treatability Studies Under CERCLA." There is no explanation for another interpretation.

Response: "Original interpretation" is intended to convey the idea that EPA is changing its thinking somewhat, as reflected in "Designing Treatability Studies for CERCLA Sites: Three Critical Issues," which appeared in the May 1991 Journal of Air Waste Management

Association and was written by dePercin, Bates, and Smith of EPA's Risk Reduction Engineering Lab.

Action: Text will be clarified.

Commenting Organization: OEPA
Pg. #9 Section #1.3.1
Original Comment #8

Paragraph #

Commentor:
Sent./Line #

Comment: Figure 1-3: Is the source for Figure 1-3 different from that used for Figure 1-2? Please clarify this.

Response: Yes. This figure was created by adding the OU-4 Treatability Study to a figure from an article by dePercin, Bates, and Smith of the EPA's Risk Reduction Laboratory ("Designing Treatability Studies for CERCLA Sites: Three Critical Issues," Journal of Air Waste Management Association, Vol. 41, No. 5, May 1991.

Action: Figure 1-3 has been revised to reference the aforementioned journal article.

Commenting Organization: OEPA
Pg. #11 Section #1.3.3
Original Comment #9

Paragraph #1st

Commentor:
Sent./Line #

Comment: Unless testing of this solid residual reveals that contaminants are below detectable limits, this material will be considered a solid waste under Ohio law.

Response: DOE agrees that the residual material could possibly be considered a solid waste as defined in Ohio Administrative Code Chapter 3745-27-01. This definition would apply if the residual material is determined to be nonhazardous in accordance with Ohio Administrative Code Chapter 3745-51 and contains radioactivity below RI/FS release limits. This residual material could then be disposed of in a sanitary landfill in accordance with the applicable portions of Ohio Administrative Code Chapter 3745-27.

Action: Most of paragraph in Section 1.3.3 was deleted. In addition, the last two sentences in Section 2.0, page 1, lines 13 to 15, were replaced with, "Solids remaining from the metals extraction would be classified a solid waste under Ohio law and could then be disposed of in a sanitary landfill."

Commenting Organization: OEPA
Pg. #11 Section #1.3.4
Original Comment #10

Paragraph #

Commentor:
Sent./Line #29-30

Comment: When will the vitrification studies of untreated silo material be addressed, and in what document?

Response: Vitrification studies of untreated silo material will be conducted under the Operable Unit 4 Treatability Study Work Plan for the vitrification of residues from Silos 1, 2, and 3. WEMCO is currently preparing a draft work plan for EPA's review.

Action: No action required.

Commenting Organization: OEPA
Pg. #12 Section #1.3.3
Original Comment #11

Paragraph #

Commentor:
Sent./Line #

Comment: Figure 1-4: Justification for the 5 pCi/g limit for the radionuclides should be provided. This would preferably be defined in a goals section.

Response: The basis for the 5 pCi/g limits for radium and thorium are DOE's generic guidelines for residual concentrations in soils. These are given in Chapter IV, Section 4 of DOE Order "Radiation Protection of the Public and the Environment", DOE 5400.5, February 8, 1990. The 5 pCi/g limit for radium 226 and radium 228 are also specified in 40 CFR 192. This serves as a preliminary goal for comparison of process effectiveness for various stabilization media. Remediation goals will be established through the risk assessment process that will determine an acceptable level of residual radioactivity in these solids.

Action: ARARs, PRGs, and other pertinent data will be presented in tabular form in the performance objectives section in Section 3.0.

Commenting Organization: OEPA
Pg. #1 Section #2.0
Original Comment #12

Paragraph #

Commentor:
Sent./Line #13-15

Comment: Unless testing of this solid residual reveals that contaminants are below detectable limits, this material will be considered a solid waste under Ohio law.

Response: See Comment No. 9 response.

Action: See Comment No. 9 action.

Commenting Organization: OEPA

Commentor:

Pg. #2 Section #2.1

Paragraph #

Sent./Line #2

Original Comment #13

Comment: The date of the Seely reference (1977) does not agree with the date in the reference list (1976). Please correct this discrepancy.

Response: The date in the text has been changed to 1976.

Action: Text has been revised.

Commenting Organization: OEPA

Commentor:

Pg. #6 Section #

Paragraph #

Sent./Line #

Original Comment #14

Comment: Figure 2-4: The last block in the flow chart should read "off-property disposal".

Response: Noted and changed so that the last block in the flow chart of Figure 2-2, Page 6 reads Off-Site Disposal.

Action: Text has been revised.

Commenting Organization: OEPA

Commentor:

Pg. #1 Section #3.1

Paragraph #

Sent./Line #

Original Comment #15

Comment: Objective bullets: An additional objective of the treatability testing should be to determine the leachability of all radionuclide and HSL constituents from the final waste form. This information will be important in evaluating the long term effectiveness as well as the reduction in mobility for each treatment option.

Response: Agreed.

Action: Text has been revised.

Commenting Organization: OEPA

Commentor:

Pg. #1 Section #3.1

Paragraph #

Sent./Line #14

Original Comment #16

Comment: This section refers to the "laboratory treatability testing program." This program is not mentioned elsewhere in the test. The titles of various phases of the treatability study need to be consistent.

Response: Reference to laboratory treatability program was deleted from this section.

Action: Text has been revised.

Commenting Organization: OEPA

Pg. #

Section #

Paragraph #

Original Comment #17

Commentor:

Sent./Line #

Comment: Table 3-2, "Stabilization Test DQOs": Each test should reference the method to be used, or should reference a detailed explanation of the method in the appendix.

Response: Agreed. Test procedures used in this study have been added to Appendices B and C.

Action: Text has been revised to include the above.

Commenting Organization: OEPA

Pg. #

Section #

Paragraph #

Original Comment #18

Commentor:

Sent./Line #

Comment: Table 3-2, "Stabilization Test DQOs", 5-Day Static Leach Test: There is no explanation for this test being used. This test should also have a description of its procedures located preferably in the appendix.

Response: The 5-Day Static Leach Test uses a monolith and demineralized water. These conditions are more representative of what would be expected for waste placed in a disposal facility. The procedure for the 5-Day Static Leach Test is given in Appendix C.

Action: Text has been revised to include the above.

Commenting Organization: OEPA

Pg. #

Section #

Paragraph #

Original Comment #19

Commentor:

Sent./Line #

Comment: Table 3-2: Any DQO Level V should have a justification for its use and a description of its procedures located in the appendix.

Response: Justification: DQO level 5 is a nonstandard procedure. They are used as screening tests and/or as tests to permit rapid turn-around of analytical data. During the Advanced Phase, the final radiological and TCLP analyses are DQO level 4 and will follow CLP. See OEPA specific comment 17.

Action: None required.

Commenting Organization: OEPA

Pg. #6 Section #3.2.1

Paragraph #

Commentor:

Sent./Line #2

Original Comment #20

Comment: Provide a copy of the MTCLP method. Discuss how the changes in the method would still provide for valid results for use in the treatability study.

Response: The MTCLP is a scaled-down version of the full TCLP tests. The extraction fluids used (i.e., TCLP Type 1 and 2) and the ratio of leachant to solid are the same in both tests. The extraction efficiency of the two methods should therefore be the same. The limit of detection is dependent on the analytical instrument used to analyze the metal content of the leachate. It is therefore reasonable to look for results near the TCLP regulatory limits with the MTCLP.

The MTCLP is being used only during the preliminary phase. The standard TCLP will be used in the Advanced Phase. The selection criteria for the most promising cement based formulations are that the treated sample will have an unconfined compressive strength of approximately 500 psi, meet the TCLP standards, and have a minimum volume increase after treatment. The third criteria will be a secondary requirement. For vitrification, the formulations should meet all of the TCLP standards, form a durable glass and have minimum volume increase. In addition, all leaching data will be inspected by the persons in the Risk Assessment Group to assist in the selection of the most promising formulations for further analysis and testing.

Also refer to OEPA comment No. 17.

Action: The MTCLP method will be described in Appendix C.

Commenting Organization: OEPA

Pg. #6 Section #3.2.2

Paragraph #

Commentor:

Sent./Line #16

Original Comment #21

Comment: Define "adequate waste form."

Response: The sentence has been deleted from the text.

Action: Text has been revised.

Commenting Organization: OEPA

Commentor:

Pg. #6 Section #3.2.2

Paragraph #

Sent./Line #22

Original Comment #22

Comment: DOE should provide a reference for the bulking factor equation.

Response: Bulking factor is simply the ratio of the volume increase or decrease of waste (due to treatment) to the volume of the waste before it was treated. The equation was not obtained from a reference but was derived using the waste densities and weight of additives. The derivation of the equation is in Appendix C.

Action: Text revised.

Commenting Organization: OEPA

Commentor:

Pg. #7 Section #3.2.2

Paragraph #

Sent./Line #3

Original Comment #23

Comment: The title of this document should be provided and it must be included in the References Section.

Response: Title of document "Stabilization/Solidification of CERCLA and RCRA Wastes" was added to the text as it was also added to the reference section.

Action: Text has been revised.

Commenting Organization: OEPA

Commentor:

Pg. #7 Section #3.2.3

Paragraph #

Sent./Line #11

Original Comment #24

Comment: Explain the rationale for using composite samples in the advanced screening tests for silo 3. How many samples will be tested?

Response: The physical properties of the Silo 3 material should be fairly consistent throughout the silo. Only composite samples are available to work with, but because of the physical nature of the material, composite samples should be adequate.

Action: No action required.

Commenting Organization: OEPA

Pg. #7 Section #3.3

Original Comment #25

Paragraph #

Commentor:

Sent./Line #

Comment: Objective Bullets: An additional objective of the treatability testing should be to determine the leachability of all radionuclide and HSL constituents

Response: Added an additional objective "to determine the leachability of all radionuclides and HSL constituents from the final waste form".

Action: Text has been revised.

Commenting Organization: OEPA

Pg. #7 Section #3.3

Original Comment #26

Paragraph #

Commentor:

Sent./Line #22-23

Comment: Provide further discussion and justification for this objective.

Response: This line had a typographical error. The revised sentence should read: "To extract RCRA metals so that the insoluble residue will meet TCLP standards (i.e., produce a non-hazardous residue as defined by RCRA)."

Action: Revised text.

Commenting Organization:

Pg. # 8 Section #3.4

Original Comment #27

Paragraph #

Commentor:

Sent./Line #23

Comment: Define what makes the leaching process "successful."

Response: Added statement describing successful as "insoluble waste has favorable TCLP and risk based radiological test results.

Action: Text has been revised.

Commenting Organization: OEPA

Pg. # 11 Section #3.4

Original Comment #28

Paragraph #

Commentor:

Sent./Line #2

Comment: The stabilized precipitate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is being carried forth.

Response: The precipitation of the leachate experiments are preliminary tests to determine which type(s) of precipitation reagents will be needed to remove the majority of the hazardous and radioactive metals from the leachate before the liquid is sent to the site-wide water purification system. The subsequent stabilization or vitrification of the leachate are also preliminary tests. They will be used to determine if the treatment of the precipitated material has a reasonable chance of success and to provide preliminary cost data for analysis of the total leaching alternative. A MTCLP will be conducted to determine the RCRA metal leachability of the treated material. If the leaching alternative is carried forward, a full TCLP should be conducted during the Remedy Design Phase when the actual precipitating reagents and larger volumes are used.

Action: Text revised.

Commenting Organization: OEPA
Pg. #11 **Section #3.4**
Original Comment #29

Paragraph #

Commentor:
Sent./Line #3

Comment:

- a) The vitrified leachate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.
- b) Provide a method for the PCT; preferably in the appendix.
- c) Explain how the leachate will be vitrified.

Response:

- a. See Comment 28 response.
- b. See OEPA specific comment #17.
- c. A procedure for vitrification has been added to Appendix C.

Action: Document has been revised.

Commenting Organization: OEPA
Pg. # **Section #**
Original Comment #30

Paragraph #

Commentor:
Sent./Line #

Comment: Table 3-3, "Metals Extractions Tests DQOs", PCT: There is no explained reason for this test being used. This test should also have a description of its procedures, preferably in the appendix.

Response: Refer to OEPA comment #17.

Action: The text has been revised to describe the objective of the test.

Commenting Organization: OEPA
Pg. # Section #
Original Comment #31

Paragraph #

Commentor:
Sent./Line #

Comment: Table 3-3, "Metals Extractions DQOs": Each test should reference the method to be used, or should reference a detailed explanation of the method in the appendix.

Response: Agreed.

Action: The table has been revised to cross reference procedures to the correct appendix. See also OEPA comment #17.

Commenting Organization: OEPA
Pg. #1 Section #4.1
Original Comment #32

Paragraph #

Commentor:
Sent./Line #1

Comment: Explain the rationale for using a 3/8 inch mesh screen. Define "obvious debris."

Response: The 3/8-inch mesh screen size was selected due to the use of 3/8 inch screens in the TCLP test. Obvious debris would include chunks of wood, metal, or plastic.

Action: The data-required sections will be changed to include a record of the maximum particle size treated, if the material was crushed/ground before use, and the weight/percentage of material sieved out from the raw waste before treatment. The text has been revised in Sections 4.1.5 and 4.2.7.

- The maximum particle size treated, weight and percentage of material sieved out from the raw waste before treatment.
- General description of the waste form before and after reagents are mixed, this includes a description of any grinding of the sample to meet particle size requirements for UCS.

Commenting Organization: OEPA
Pg. #1 Section #4.1.2.1
Original Comment #33

Paragraph #

Commentor:
Sent./Line #17

Comment: What kind(s) of acid will be used?

Response: The acids to be used are listed in Tables 4-2 and 4-3.

Action: None required.

Commenting Organization: OEPA
Pg. #3 Section #4.2
Original Comment #34

Paragraph #

Commentor:
Sent./Line #2

Comment: Explain the rationale for using a percent weight/weight composite for soil types.

Response: This compositing scheme was designed for 1989 samples from Silos 1 and 2. Plans to use this 1989 material have been dropped, so the table is no longer applicable.

Action: Table will be deleted.

Commenting Organization: OEPA
Pg. #3 Section #4.2
Original Comment #35

Paragraph #

Commentor:
Sent./Line #8

Comment: Explain the rationale for the analytes in Table 4-2.

Response: The list of physical properties and chemicals in Table 4-2 was selected since they may affect the cement reactions or affect the glass-making reactions of vitrifications.

Action: None required.

Commenting Organization: OEPA
Pg. #10 Section #4.3.2
Original Comment #36

Paragraph #

Commentor:
Sent./Line #28

Comment: This sentence is not clear in designating what silos will be used for the tests.

Response: The sentence contains a typo. It will be revised to state that bentonite will be used in Silos 1 and 2 tests.

Action: Text has been revised.

Commenting Organization: OEPA
Pg. #10 Section #4.3.2
Original Comment #37

Paragraph #

Commentor:
Sent./Line #28-31

Comment: Top, middle and bottom layers should be defined, to reference an actual location in the silos.

Response: These are Zones A, B, and C, respectively. Each zone corresponds to one-third of the silo height.

Action: A figure that defines the zones will be added to Section 6.0.

Commenting Organization: OEPA

Pg. #10 **Section #4.3.2**

Original Comment #38

Paragraph #

Commentor:

Sent./Line #28

Comment: Recent sampling in the silos indicates that there may be cavities within the waste extending to lower levels in the silos. When bentonite is added to the silos, it may enter these lower cavities. The stabilization tests should therefore be conducted on additional strata of the waste, not just the top stratum.

Response: Line 30 states that bentonite will also be used in tests on the middle stratum.

Action: None required.

Commenting Organization: OEPA

Pg. # 11 **Section #4.3.3**

Original Comment #39

Paragraph #

Commentor:

Sent./Line #2

Comment: Explain the rationale for using composite samples in the advance screening. How many samples will be tested.

Response: See response to Comment No. 24.

Action: See action for Comment No. 24.

Commenting Organization: OEPA

Pg. #11 **Section #4.4.1**

Original Comment #40

Paragraph #

Commentor:

Sent./Line #24

Comment: Identify acids in the text.

Response: It is not necessary to list the acids in the text. They are listed in Table 4-4.

Action: None required.

Commenting Organization: OEPA
Pg. #11 Section #4.4.1
Original Comment #41

Paragraph #

Commentor:
Sent./Line #29

Comment: Target compounds should not be chosen on concentration alone. If the least soluble compound is chosen as the target compound, then when screening suggests a solution works it is likely the more soluble compounds would have also leached successfully.

Response: The use of target compounds in the screening phases is in concurrence with the EPA guidance. In the EPA "Guide for Conducting Treatability Studies Under CERCLA, Interim Final", Section 2.2.1 states that "During laboratory screening, an indicator contaminant is often monitored to determine whether a reduction in toxicity, mobility, or volume is occurring."

The least soluble compound in the material will depend on the oxidation states of the metals and which counter ions are in the waste matrix. Uranium and lead were selected since their concentrations are greater than thorium or radium in the waste material.

In the Advanced Phase, the removal of radiological components and hazardous components are defined by RCRA will be confirmed. See US EPA Attachment Specific Comment 32.

Action: No action required at this time.

Commenting Organization: OEPA
Pg. #13 Section #4.4.1.3
Original Comment #42

Paragraph #

Commentor:
Sent./Line #24-25

Comment: a) Define the source of the limits suggested in this sentence.
b) Justify defining only uranium limits by risk. Final cleanup levels for the site will be risk based levels.

Response: a and b) The statements are based on the belief that uranium and radium in groundwater will dominate the risks attributable to contaminated groundwater use at the FEMP. The statement is premature and misleading in its present context.

Action: a and b) Delete sentences. The information is available in less confusing form elsewhere in the document.

Commenting Organization: OEPA
Pg. #17 Section #4.4.2
Original Comment #43

Paragraph #

Commentor:
Sent./Line #2

Comment: Describe the location and composition of the site soil and the locally available soil that will be used.

Response: The location and composition of the site soil to be used in the vitrification test has not been determined. That information will be documented in the treatability report.

Action: None required.

Commenting Organization: OEPA
Pg. #17 Section #4.4.2
Original Comment #44

Paragraph #

Commentor:
Sent./Line #8

Comment: In Figure 4-4 there is a step to evaporate leachate to dry solids. Explain in the text how this step will be accomplished.

Response: The leachate will be slowly dried in a beaker on a hot plate.

Action: The text has been revised.

Commenting Organization: OEPA
Pg. # 17 Section #4.4.3
Original Comment #45

Paragraph #

Commentor:
Sent./Line #

Comment: Are the 0.45 micron filters and the centrifuge operation representative of how the wastes would be treated in large scale operations.

Response: A 0.45-micron filter is used to determine if a removable precipitate is formed. If larger particulates are needed to improve filtration or settling, polymer addition and filter aid may be used. If this alternative is chosen, the methods of solids/liquids separation, which could include centrifuge or filtration, will be determined in the design phase.

Action: None required.

Commenting Organization: OEPA
Pg. # 17 Section #4.4.4
Original Comment #46

Paragraph #

Commentor:
Sent./Line #28

Comment: Section 4.4.2 is about vitrification. Explain where the precipitated material is generated.

Response: Line 28 on page 17 is in error. Section 4.4.2 should be 4.4.3.

Action: Text has been revised.

Commenting Organization: OEPA
Pg. #18 Section #
Original Comment #47

Paragraph #

Commentor:
Sent./Line #

Comment: Figure 4-4: The vitrified leachate should be subject to full TCLP. All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.

Response: See Comment 28 response.

Action: None required.

Commenting Organization: OEPA
Pg. #22 Section #4.4.5.1 and 4.4.5.2
Original Comment #48

Paragraph #

Commentor:
Sent./Line #

Comment: Each of the sections begins with, "If necessary, . . .". Define the criteria to determine if these tests need to be conducted.

Response: Criteria for selection has been added to text.

Action: Text revised.

Commenting Organization: OEPA
Pg. #24 Section #4.4.8
Original Comment #49

Paragraph #

Commentor:
Sent./Line #6

Comment: See comment #41.

Response: See response to Comment No. 41.

Action: No action required at this time.

Commenting Organization: OEPA

Pg. # 24 Section #4.4.8

Paragraph #

Commentor:

Sent./Line #13

Original Comment #50

Comment: a) See general comment #4.
b) All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.

Response: a) See response to general Comment No. 4
b) See response to Comment No. 28.

Action: a) See response to general Comment No. 4
b) See action for Comment No. 28.

Commenting Organization: OEPA

Pg. #24 Section #4.4.8

Paragraph #

Commentor:

Sent./Line #23

Original Comment #51

Comment: All final waste forms should be subject to full TCLP if the treatment option is to be carried forth.

Response: See response to Comment No. 28.

Action: See action for Comment No. 28.

Commenting Organization: OEPA

Pg. # Section #

Paragraph #

Commentor:

Sent./Line #

Original Comment #52

Comment: Table 5-1, "Equipment and Materials": This table should include the manufacturer and manufacturing number.

Response: Disagree. The manufacturer has already been listed where it is appropriate. There is no need for a manufacturing number.

Action: None required.

Commenting Organization: OEPA

Commentor:

Pg. #1

Section #7

Paragraph #

Sent./Line #14

Original Comment #53

Comment: This discussion of laboratory protocol for testing the laboratory will not follow the RI/FS QAPP. Please clarify this.

Response: As discussed in the response to OEPA Comment No. 5, the analytical methods and associated protocol contained in the Treatability Study Work Plan will be incorporated into the RI/FS Work Plan through the DCR process.

Action: Ensure analytical methods not now in the RI/FS QAPP are explained adequately in the Treatability Study Work Plan so that this plan can be incorporated in a timely fashion through the DCR process into the RI/FS Work Plan.

Commenting Organization: OEPA

Commentor:

Pg. #1

Section #8.1

Paragraph #

Sent./Line #4

Original Comment #54

Comment: State which leachate results will be used in the risk assessment. This is important to know because of the data quality requirements for risk assessments.

Response: The leachate from the TCLP, possibly the PCT, and 5-day static tests will be used as input to the geochemical models for fate and transport analysis.

Action: The text will be revised to clarify this.

Commenting Organization: OEPA

Commentor:

Pg. #

Section #8.4

Paragraph #

Sent./Line #

Original Comment #55

Comment: Please give a reference for these formulas.

Response: Refer to "Preparing Perfect Project Plans," EPA/600/9-89/087.

Action: Text revised.

Commenting Organization: OEPA
Pg. # Section #10.4
Original Comment #56

Paragraph #

Commentor:
Sent./Line #

Comment: Does DOE intend to archive any products of the treatability study? These could be useful for assessing the effects of radiation on vitrified and solidified material over a period of time.

Response: There is no point in archiving the samples. All samples produced in this study would not be suitable for studying radiation effects. Such tests, if appropriate, should be conducted in the remedy design phase. The accumulation dose rates are not expected to be sufficient to produce adverse effects over the course of site remediation.

Action: No action at this time.