

U-006-407.1

893

**OU#4 ALTERNATIVES
U.S. DOE FERNALD
OH6 890 008 976**

7-5-90

**USEPA/DOE
5HR-12
15
LETTER**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

893

REPLY TO THE ATTENTION OF:
5HR-12

July 5, 1990

*HAND DELIVERED
cm*

~~CERTIFIED MAIL~~
RETURNED RECEIPT REQUESTED

Bobby J. Davis
United States Department Of Energy
P.O. Box 398705
Cincinnati, Ohio 45239-8705

RE: OU#4-Alternatives
U.S. DOE-Fernald
OH6 890 008 976

Dear Mr. Davis:

On June 4, 1990, The United States Department of Energy (U.S. DOE) submitted an Initial Screening of Alternatives report for operable unit #4 for the remedial response action at the Feed Materials Production Center (FMPC) in Fernald, Ohio.

U.S. EPA has reviewed this document and has identified the following deficiencies:

GENERAL COMMENTS:

1. Insufficient information is presented on the contaminant characteristics and volumes to permit proper development and screening of alternatives.

For example, 10-year-old data on K-65 silos (Silos 1 and 2) is presented. Nothing is included for the metal oxide silo (Silo 3). The lack of volume and waste characterization data makes the cost information meaningless, although cost did not eliminate any potential alternative from being carried forward for detailed analysis. In addition, page ES-1 states that the report is based on information presented orally to U.S. DOE on June 13, 1989, and has not been updated. If any characteristic or volume information has been collected in the last year, it should be included to support the findings. The report should be reorganized and completed when all the data is available. The technologies and process options probably will not change significantly in the revised report. However, information should be presented to support the conclusions and recommendations of the report.

Date Rec'd _____
Log _____
6446.5

2. Page ES-2 states that the physical properties of the K-65 and metal oxide silos are significantly different. If the materials are as different as indicated, consideration should be given to addressing the silo remediation as two separate operable units.
3. The EE/CA states that it was prepared in accordance with EPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA." Although the guidance document was certainly used in preparing the report, it was not followed with respect to organization. The guidance document proposes screening remedial technologies and then process options within the technologies to evaluate their applicability to the site and waste characteristics. Applicable process options are then combined into alternatives. However, the report (Chapter 2) develops alternatives based on technologies rather than process options. Following the alternative developments, the technologies used are discussed in detail (Chapter 4). Each technology and process option should be explained and reviewed with respect to its applicability to the waste and site characteristics, and the report should be reorganized.
4. Several procedures required by the National Contingency Plan (NCP) and detailed in the guidance document have not been followed.
 - a. Remedial action objectives are based on the contaminants of concern, exposure pathways, and cleanup levels required to protect human health and the environment. The report reviewed only removal and contaminant-isolation alternatives; it did not evaluate process options that use treatment to reduce the mobility, toxicity, or volume of hazardous substances. The immediate elimination of methods that may reduce migration through exposure pathways needs additional explanation.

In addition, the report does not state the contaminant cleanup levels. The volume of contaminants and the level of protection required for stored materials cannot be evaluated without defined cleanup goals. The remedial action objectives should be better defined.
 - b. The guidance document requires documentation for eliminating remedial technologies or process options during screening. The guidance also suggests a method of presenting and documenting the screening of technologies and process options. Figure 1 of the report did not follow this procedure. Although the final technologies used would likely be the same,

better documentation is needed of how they were selected and others eliminated.

- c. The guidance document suggests reviewing various process options within a technology and selecting one or two for developing alternatives. However, the report develops alternatives from technologies, not process options. For example, the alternatives use removal of material through mechanical, hydraulic, or pneumatic means. The three methods of removal should be analyzed in the report and one or two selected as the best. The process option selected would then be used in the alternative, not the technology type. Prior to alternatives development, the process options be reviewed and selected.
- d. The guidance document suggests that costs for alternatives be compared on a present-worth basis. Capital and operation and maintenance (O&M) costs must be estimated, and a present worth for the alternative calculated.

The report, however, does not include O&M costs. Instead, it states that O&M costs represent a small portion of the total cost and, thus, were not calculated. Without any detail, this statement is difficult to evaluate. However, the present worth of O&M costs over 30 years can frequently be in the tens of millions of dollars -- the same order of magnitude as the capital costs reported. The O&M costs should be estimated and included in the report.

- e. The ARARs should be presented in the format should in the U.S. EPA guidance and as agreed upon in a May 3, 1990, meeting in Chicago.

SPECIFIC COMMENTS

5. Section ES, Page 1, Paragraph 3: The remedial action objectives must have specific cleanup levels. The alternatives must be protective of human health and the environment. Without specific limits, protection cannot be evaluated.
6. Section ES, Page 4, Paragraph 4: The effectiveness evaluation should indicate that both short- and long-term effectiveness are addressed.
7. Section ES, Page 4, Paragraph 6: Capital cost for alternatives screening is discussed in Chapter 4, page 37, of the guidance document. Although similar to

Chapter 6, the costs are not as detailed and are used to compare alternatives with a +50 to -30 percent accuracy.

8. Section ES, Page 5, Paragraph 1: Table ES-1 was not included.
9. Section 1, Page 2, Paragraph 1.3.1: ~~The clearwell is not shown on Figure 1-2. Either add the clearwell to Figure 1-2 or reference Figure 1-3.~~
10. Section 1, Page 2, Last Paragraph: It is unclear whether the K-65 silos have been totally coated with gunite or just the exposed portions.
11. Section 1, Page 6, Paragraph 1.3.3: The importance of the undetermined amount of thorium and its effect on selecting alternatives must be discussed.
12. Section 1, Page 9, Table 1-1: The units for the volume must be provided. Since the K-65 silos are considered to be moist, all information on the moisture content should be included. Table 1-1 should explain whether the data presented under NLO is considered valid site data.
13. Section 1, Page 10, Last Paragraph: The report says that Silo 3 is not a significant radon source and is not believed to be a source of contaminant migration. If so, the report should explain the actual contamination problem associated with the Silo 3 waste.
14. Section 2, Page 1, Paragraph 2.1: Include the word "Report" in the third line.
15. Section 2, Page 1, Paragraph 2.1.1: The report should clarify that the silos are an active source of radon contamination to the atmosphere.
16. Section 2, Page 2, First Paragraph: The NCP does not require full removal of the contaminant source. Instead, the alternatives must be protective of human health and the environment. Other alternatives that may be considered do not include full removal, but are protective.
17. Section 2, Page 2, Paragraph 2.1.2-1: Although similar in nature, the general response actions are not the same as used in the guidance document. The development of alternatives would be better supported if the guidance document was followed more closely.

18. Section 2, Page 2, Paragraph 2.1.2-2: The text and Figure 2-1 are inconsistent. Containment is not shown on Figure 2-1. Chemical treatment is shown on the figure, but not included in the text. Tumulus, above-grade vaults, and off-site RCRA facilities are not shown on Figure 2-1.
19. Section 2, Page 3, Figure 2-1: This figure is not consistent with the guidance document. It is harder to follow and doesn't document technologies eliminated.
20. Section 2, Page 5, Table 2-1: "No action" should not be considered on-site disposal.
21. Section 3, Page 1, Paragraph 1: As detailed in the guidance document, alternatives should be developed from process options, not technologies.
22. Section 3, Page 1, Paragraph 3.2-1: Information is needed concerning time estimates for remediation, particularly since contaminant volumes have not been defined.
23. Section 3, Page 5, Paragraph 1: The data uncertainties that affect the cost estimates should be listed. These can then be improved during detailed review.
24. Section 3, Page 5, Paragraph 3: If O&M costs cannot be determined, they cannot be judged negligible. The O&M costs should be included. The type of monitoring and associated costs must be included in the O&M costs. Finally, the report should discuss the potential future remediation efforts that are not costed.
25. Section 3, Page 5, Paragraph 3.4: ARARs must also be addressed for contaminants that do not remain on-site. The sentence should be modified.
26. Section 3, Page 6, Paragraph 3.5: It is unclear where the assumed off-site disposal facility is located. The location assumed for cost estimating purposes should be defined.
27. Section 3, Page 6, Paragraph 3.5: The detailed analysis of alternatives is always performed after the screening of alternatives. Define the assumptions used to screen alternatives so that when the data is collected, the assumptions can be checked.
28. Section 3, Page 7, Paragraph 1: The word "reduced" is not used correctly. The short-term effectiveness of an

- alternative may be less than another alternative, but it is not reduced.
29. Section 3, Page 7, Paragraph 3.5.4-2: No reasons for off-site disposal were stated, only difficulties. Additional discussion is needed.
 30. ~~Section 3, Page 7, Paragraph 3.5.5-1: By definition of no-action, no remediation is planned. The comparison of cost savings is questionable when actual cleanup levels and volumes have not been defined.~~
 31. Section 3, Page 7, Paragraph 3.5.5-2: Institutional controls have not been listed as a remedial technology or included in alternatives.
 32. Section 3, Page 7, Paragraph 3.5.5-2: Define the content of 10 CFR 61 to assist the readers. Page 3-5, paragraph 3, states that O&M costs are negligible; however, page 3-7 states that the O&M costs are significant. This should be consistent.
 33. Section 3, Page 8, Paragraph 3.5.7: "TCLP" should be spelled-out when it is first referenced.
 34. Section 4, Page 1: In accordance with the guidance document, technologies should be reviewed and evaluated before alternatives are defined.
 35. Section 4, Page 7, Paragraph 1: Water treatment needs to be discussed. The report should state whether water is to be treated in existing facilities, and if so, include the treatment costs in other sections of the report.
 36. Section 4, Page 7, Paragraph 4.2: As described in the guidance document, the process options should be discussed, then they should be reviewed with respect to implementability, effectiveness and cost. Finally, one or two should be selected for alternatives development.
 37. Section 4, Page 9, Paragraph 4.3: See comment for 4.2 above.
 38. Section 4, Page 10, Paragraph 4.4.2: The moisture content should be listed for the wastes so the use of vitrification can be evaluated.
 39. Section 4, Page 11, Paragraph 4.5, last sentence: Add "the" in front of "lowest".

40. Section 4, Page 11, Paragraph 4.6: The discussion of sludge treatment and disposal requirements needs to be further developed.
41. Section 4, Page 12, Paragraph 4.7: Regulation titles should be defined for the reader.
- ~~42. Section 4, Page 14, Paragraph 4.7: See comment for 4.2 above.~~
43. Section 4, Page 20, Paragraph 4.9: Define 49 CFR 173.469 for the reader.
44. Section 4, Page 22, Paragraph 4.9: See comment for 4.2 above.
45. Section 5, Page 1: See general comments. Many alternatives address Silos 1 and 2 (Alternatives 6,7,8,9) or Silo 3 (Alternatives 3,4). For final remediation, all silos should be included in an alternative. A figure for each alternative would be helpful.
46. Section 5, Page 3, Paragraph 5.1.3.3: The silos would require maintenance under the no-action alternative.
47. Section 5, Page 3, Paragraph 5.1.4: The monitoring equipment and the scope of monitoring each medium should be described. Additionally, O&M costs are associated with the monitoring equipment.
48. Section 5, Page 3, Paragraph 5.1.6-2: Paragraph 5.1.4 states that the capital costs could be \$1 million. The costs should be consistent.
49. Section 5, Page 4, Paragraph 5.2.1: Describe the procedures for verifying that the grout under the silos assures a seal. If there is no seal, migration could continue.
50. Section 5, Page 5, Paragraph 5.2.1.6: Explain why Silos 1 and 2 will subside and how leachate will be collected and treated.
51. Section 5, Page 5, Paragraph 5.2.2.1: The uncertainty of the containment techniques need to be addressed here or during evaluation of the containment technologies.
52. Section 5, Page 6, Paragraph 5.2.3.3: The perpetual maintenance and monitoring requirements and costs should be discussed. The O&M costs need to be included in the costs.

53. Section 5, Page 7, Paragraph 5.3.1-3: It may be more appropriate to grout prior to removing the silo domes to protect the environment if there is a spill.
54. Section 5, Page 7, Paragraph 5.3.1-3: If silos are grouted and a slurry wall is installed to the grout, a bathtub effect could occur. ~~Water collection and an impermeable cap should be considered to minimize this effect.~~
55. Section 5, Page 8: In-situ vitrification and chemical stabilization should be discussed in Chapter 4.
56. Section 5, Page 8, Paragraph 3: Vitrification in the silos could affect the strength of the silo wall. This needs to be addressed.
57. Section 5, Page 9, Paragraph 5.3.1.3: Discuss the information to be generated from the pilot-scale study and how it will be used.
58. Section 5, Page 10, Paragraph 5.3.1.7: Define NESHAP for the reader.
59. Section 5, Page 11, Paragraph 5.3.3.5: As previously discussed, vitrification and chemical stabilization could be in separate alternatives. Then, in-situ vitrification would compare poorly to stabilization on a cost basis, but may be preferred due to effectiveness or implementability.
60. Section 5, Page 14, Paragraph 5.4.1.1: The packaging system should be added to the systems requirements list.
61. Section 5, Page 14, Paragraph 5.4.1.3: Since the volume of Silo 3 has never been stated, more information is needed to explain how the time frame was estimated.
62. Section 5, Page 15, Paragraph 5.4.1.6: Explain where the wastewater will be recycled.
63. Section 5, Page 16, Paragraph 5.4.5: Characterization of Silo 3 wastes is needed.
64. Section 5, Page 17, Paragraph 5.5.1-Last: Packaging was required in Alternative 3.
65. Section 5, Page 17, Paragraph 5.5.1.1: Add packaging to the systems requirements list.

66. Section 5, Page 21, Paragraph 5.5.4: The off-site disposal location assumed for cost estimating purposes needs to be defined.
67. Section 5, Page 22, Paragraph 5.6.1: The use of Silo 3 or Silo 4 will affect the cost of this alternative. One or the other options should be selected and then the alternative developed. ~~If one option cannot be selected at this time, it may be appropriate to develop two separate alternatives.~~
68. Section 5, Page 22, Paragraph 5.6.1.1: Short-term storage (if Silo 3 used) and transfer facilities (if Silo 4 used) should be included in the systems requirement list.
69. Section 5, Page 23, Paragraph 5.6.1.1: Waste from hydraulic removal must be added to the list.
70. Section 5, Page 23, Paragraph 5.6.1.6: The short-term risk associated with this alternative should be reviewed. It seems that the short-term risk associated with packaging would be greater than for transferring the material between silos.
71. Section 5, Page 24, Paragraph 5.6.2.2: See comment for 5.6.2.1 above.
72. Section 5, Page 25, Paragraph 5.7.1: Silo 3 wastes are described as more dry than that wastes in Silos 1 and 2. The effects of moisture content on removal needs to be discussed.
73. Section 5, Page 28, Paragraph 5.7.1.4: A 12-acre area is required for on-site disposal of Silo 3 wastes; yet for Silos 1 and 2, 15 acres is required. Although the volumes have not been defined, the 15 acres seems small.
74. Section 5, Page 28, Paragraph 5.7.1.5: A container has been selected for cost estimating purposes. The container, material, and package retrievability should be discussed.
75. Section 5, Page 33, Paragraph 5.8.15: No data has been presented to indicate the contamination of the silo berm material. This needs to be included to properly evaluate the alternative.

76. Section 5, Page 35, Paragraph 5.8.1.6: The costs should be checked. In alternative 4, the difference for one silo (Silo 3) was \$16 million. It would seem that the off-site disposal of two silos (Silo 1 and 2) in the same type of containers might be more than a difference of \$5 million.
77. Section 5, Page 39, Paragraph 5.8.1.6: The list should include (1) any equipment too contaminated to warrant decontamination, and (2) wastewater from precipitation.
78. Section 5, Page 44, Paragraph 5.10.1.6: The list should include wastewater from precipitation.
79. Appendix A: The National Emission Standards for Radon Emissions for U.S. DOE facilities, 40 CFR 61, Subpart Q (54 Federal Register 51701).

Additional comments are presented in an attachment.

U.S. DOE must address all the above deficiencies and comments in a revised document and submit it to U.S. EPA within thirty (30) days of the date of this letter.

Please contact me at (312) or FTS 886-4436, if there are any questions.

Sincerely,



Catherine A. McCord
Remedial Project Manager

cc: Maury Walsh, OEPA - CO
Graham Mitchell, OEPA-SWDO

U.S. EPA Supplemental Comments to Initial Screening of Alternatives for Operable Unit 4, Remedial Investigation and Feasibility Study for Feed Materials Production Center, Fernald, Ohio (July 5, 1990)

ES-1: Remedial Action Objectives: Control and reduce the release of radon gas from wastes

ES-2: Alternative 2-...
Both conventional physical stabilization technologies...
It would be helpful to explain what conventional physical stabilization technologies are.

A.1 INTRODUCTION:

First Para.: The ... DOE must generally comply with all provisions of federal environmental statutes and regulations...

Section 120(a)(2) of CERCLA states that DOE must ... in the same manner and to the extent as such guidelines, rules, regulations, and criteria are applicable to other facilities....at least not inconsistent.

Sec. para: Applicable requirements are those federal and state requirements that specifically address a hazardous substance, pollutant, contaminant remedial action, location or other circumstance found at a CERCLA site (300.400(g)). Consider changing first sentence as above to be accurate.

Sec. sentence: Add Solid Waste Disposal Act required by (121(d)(2)(A)(i)).

Third sen: Relevant and appropriate requirements are those federal and state human health and environmental requirements that apply to circumstances sufficiently similar to the release or remedial action contemplated (relevant) and are well-suited to the site (appropriate).
300.000(g)

Fourth Sen: Recommend deleting this sentence which seems

contradictory with final sentence in paragraph.

893

A-10: Ohio regulations will be analyzed for status as ARARs as they are applied to the alternatives. That is, that they are promulgated (of general applicability and legally enforceable), identified by the state in a timely manner (300.515(d)(2) and (h)(2), and more stringent than federal requirements and therefore are potential ARARs. The NCP at 300.515(d)(3) provides that at the RI/FS report stage notification of determination of waivers or disagreements with the state as to the status of any State ARAR will be made.

3-1: INTRODUCTION

It is helpful to add the NCP references as authority for the analysis undertaken, for example:

The last sentence of this paragraph: It is the intent...by comparatively evaluating them on the basis of effectiveness, implementability and cost in accordance with the NCP at 300.430(e)(f).

P. 3-4, 3.3.1: A key aspect of the screening evaluation is the effectiveness of an alternative in protecting human health and the environment in accordance with the NCP at 300.430(e)(7)(i).

3.3.2: Implementability is a measure of both the technical and administrative feasibility...alternative in accordance with Section 300.430(e)(7)(ii) of the NCP.

3.3.3: Cost estimates were prepared for each alternative to allow comparison of costs among similar alternatives in accordance with Section 300.430(e)(7)(iii) of the NCP.

3-5, 33.4 Innovative Technologies

Last sentence; suggest follow NCP language here:
Nevertheless, these technologies were carried through the screening phase if there was reason to believe that they offered the potential for comparable or superior performance or implementability; fewer or lesser adverse impacts than other available approaches; or lower costs for similar levels of performance than demonstrated treatment technologies in accordance with Section 300.430.

5-3, 5.1.6 Screening Summary

Second Para.: Initially, this alternative is the most effective...

This is an inappropriate use of cost effectiveness as

defined in the NCP. Section 300.430(f)(1)(ii)(D) explains that an alternative is cost effective if its costs are proportional to overall effectiveness.

893

6-1, 6.1 Alternatives Recommended for Detailed Analysis

Sixth Sentence: As a result of this evaluation...:

It is not clear that Alternative 5 has been screened out in accordance with the NCP. Section 300.430(e)(7) provides that alternatives may be eliminated on the basis of that it is not effective, technically or

administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time.
