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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 10 HANFORD PROJECT OFFICE  
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RICHLAND, WASHINGTON 99352

May 3, 1994

Bryan L. Foley  
U.S. Department of Energy  
Richland Operations Office  
P.O. Box 550, A5-19  
Richland, WA 99352

Re: Proposed Plan Comments for the Environmental Restoration  
Disposal Facility

Dear Mr. Foley:

The U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and their contractors have completed the review of the Proposed Plan for the Environmental Restoration Disposal Facility DOE/RL-94-47, Hanford, Washington. Enclosed are the combined comments on the content of this report.

Also, enclosed is a copy of the Ecology's comments, as the support agency, for inclusion into the Administrative Record. A separate response to these comments is not required.

A WordPerfect 5.1 diskette is enclosed for your convenience.

If you have any questions or concerns regarding these comments, please contact me at (509) 376-4919.

Sincerely,

Pamela S. Innis  
Unit Manager

Enclosure

cc: Patrick Willison, DOE  
Steve Wisness, DOE  
Michael Collins, DOE  
Norm Hepner, Ecology  
Dan Duncan, EPA  
Andy Boyd/Dean Ingemansen, EPA  
Jeff Ross, PRC  
Bill Lum, USGS  
Vern Dronen, WHC  
Administrative Record (ERDF)



## INTRODUCTION

The U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and their contractors have completed the review of the Proposed Plan for the Environmental Restoration Disposal Facility, DOE/RL-94-47, Decisional Draft, dated April 1994. This document was reviewed for consistency with the draft regulatory package prior to comment resolution therefore some issues may have been resolved. General and specific comments on the proposed plan are presented below.

### GENERAL COMMENTS

The current proposed alternative design should be a double lined facility with a RCRA compliant cover. This is consistent with the Tri-Party Agreement negotiations and with the conceptual design.

The Proposed Plan should be written for the public and should be structured for ease of reading. It should consider the audience, their concerns and the information they would like to see. It is our recommendation to include representatives from each agency in a working session to rewrite this document.

The RI/FS will require changes as a result of comment resolution. These changes should be reflected in the proposed plan.

The proposed plan does not clearly describe why the facility is needed nor why the specific site was selected.

The proposed plan does not clearly indicate the location and area to be used for the proposed Environmental Restoration Disposal Facility (ERDF) under project W-296 and for the future waste derived during the entire life of environmental remediation. The estimated total quantity of waste to be disposed in the ERDF is not substantiated with reference documents. The proposed plan mainly focuses on the long-term effectiveness and permanence of the preferred alternative against infiltration but does not adequately consider human intrusion and erosion. These omissions should be corrected.

Many figures in the proposed plan are not effective. The plan should include a location graphic on page 1 similar to Figure 1. A figure of the general layout of the deep area-fill trench to include the liner and barriers should be provided. Other graphics should be used convey information. Graphics should be placed within the text an not isolated at the end of the document.

#### **SPECIFIC COMMENTS**

**Introduction, page 1, first paragraph.** The text states that the ERDF will serve as the disposal facility for most of the waste excavated during remediation of waste management units. The phrase "most of the waste excavated" should be replaced with "excavated wastes that are impracticable to treat" to demonstrate a commitment to seriously considering treatment alternatives.

**Introduction, page 1, first paragraph, third sentence:** The ERDF will not accept RCRA closure waste at this time. The facility will accept CERCLA and RCRA Corrective Action remediation waste.

**Introduction, page 1, first paragraph, fourth sentence:** It should be noted that the State will likely be issuing the permit for the facility. Also, change 40 CFR 264-552 to 40 CFR 264.552.

**Introduction, page 2, second paragraph.** The text states that the U.S. Department of Energy intends to address requirements of the National Environmental Policy Act (NEPA) within the remedial investigation and feasibility study (RI/FS) and using a NEPA roadmap document. The NEPA roadmap document does not address requirements itself, but directs the reader to those sections of the RI/FS and corrective action management unit (CAMU) application that do. The text should be revised appropriately.

The second and third sentences both include cultural resources. This should be deleted from one of the sentences.

The last sentence of this paragraph should be deleted. It is irrelevant to the proposed plan.

**Introduction, page 2:** Please change the EPA address to the following:

U.S. Environmental Protection Agency  
Attn: **Pamela** Innis  
712 Swift Blvd., **Suite 5**  
Richland, WA 99352  
(509) 376-4919

**Site Background, pages 2 and 3:** This Section should include separate captioned discussions on site selection, waste volumes, hydrogeology and habitat.

**Site Background, page 2, first paragraph.** This section should begin with a brief overview of the Hanford site to orient the reader. This overview should include a description of the reservation, the number of contaminated areas, the types of contaminants, the reasons why a disposal facility is needed, and the role of the disposal facility in the overall resolution to the environmental problems at the Hanford reservation.

**Site Background, page 2, first paragraph.** This paragraph states, "The proposed site will cover 4-square kilometers (1.6 square miles) on the 200 areas plateau. The 5-square kilometer (two square miles) expansion site will extend east of the primary site, due south of the 200-East Area." In the RI/FS report for the ERDF (DOE 1994a) the text states, "The proposed ERDF site will cover 10 square kilometers (four square miles) on the 200 Area plateau. The 5-square kilometer (two square miles) expansion site will extend east of the primary site, due south of the 200 East Area." The text states that the expansion site will cover 2 square miles east of the primary site, due south of the 200 East Area. Based on recent discussions, it is unclear

whether 2 square miles is still needed for the expansion site. The text should clearly indicate the following to the public:

- The area to be used for the proposed ERDF under project W-296
- The area to be used for the proposed ERDF to contain all waste derived during the entire life of environmental remediation
- The location of the expansion site to be used to contain all wastes derived during the entire life of environmental remediation
- The location of buffer zones

A more detailed figure showing the ERDF boundaries with respect to the 200 East and West Areas, and the recommended waste management area boundary should be provided.

Management activities should be deleted from the last sentence. The intent of the ERDF is to consolidate **waste** in the 200 Area.

**Site Background, page 3, first paragraph.** This paragraph states that contaminated groundwater from the 200 West Area has migrated beneath the ERDF site, and the highest concentrations of contaminants have been detected at the northwest corner of the ERDF. The proposed plan should explain whether remedial actions will be taken to control the contaminant plume migration before the construction of the ERDF as well as to potentially remediate the contaminated plume beneath the ERDF site.

**Site Background, page 3, second paragraph.** The first sentence of this paragraph can be simplified to "groundwater contamination related to the 200 West Area has migrated beneath the ERDF site."

**Site Background, page 3, fourth paragraph.** Given the impacts that archaeological finds have had on facility siting and actual construction, the text should expand on the significance of the Hanford Cultural Resources Laboratory study findings relative to

the proposed boundaries of the ERDF trench and support facilities.

**Remedial Action Objectives, page 4, #1, last sentence:**

Institutional controls cannot be guaranteed to cover the life of many of the radionuclides. Direct exposure should be used in the evaluation of the alternatives.

**Remedial Action Objectives, page 4, #2, third sentence:** Change "inconsequential compared with" to "far less than".

**Waste Acceptance Criteria, pages 4 and 5:** The discussion of waste volumes and characteristics would be more appropriately located in the Site Background section.

**Waste Acceptance Criteria, page 4, second paragraph.** The terms "outfall structures", "cribs", and "french drains" should be defined in the glossary.

**Waste Acceptance Criteria, page 5, continuation of second paragraph from page 4.** The text states that the total quantity of waste in the 100 Area is approximately 24 million cubic yards ( $\text{yd}^3$ ). The RI/FS gives an estimate of 37 cu. yds. A consistent volume estimate should be given.

**Waste Acceptance Criteria, page 5, first paragraph.** The volume of waste associated with the 200 Area waste units is reportedly 7.2 million  $\text{yd}^3$ . The source inventory development engineering study does not document the volume of waste associated with the 200 Area waste unit. A reference source, therefore, should be stated in the text for the reported volume estimate.

**Waste Acceptance Criteria, page 5, second paragraph.** The text reports that an anticipated total of approximately 6 million  $\text{yd}^3$  of wastes will be excavated during cleanup of the 300 Area. According to the source inventory development engineering study,

the total contaminated waste volumes from the 300 Area is estimated at 2.1 million yd<sup>3</sup>. This discrepancy should be clarified, and the text should be changed accordingly.

**Waste Acceptance Criteria, page 5, fourth paragraph.** This paragraph states that most of the contaminants were predicted to reach groundwater at extremely low concentrations (i.e., less than 1 part per trillion). This paragraph should also discuss the contaminants that exceeded the de minimis screening criteria for groundwater contamination at the ERDF.

The text states that soil and air exposures can only result in the event of a failure event in conjunction with loss of institutional controls. Since the wastes in this facility will remain hazardous (radioactive) for thousands of years, risks caused by a loss of institutional controls should be determined.

**Waste Acceptance Criteria, page 5, fifth paragraph.** The report assumes that much of the waste received at the ERDF would comply with the leachate criteria without treatment. This assumption may be applicable to contaminated soils but not to other wastes such as highly contaminated debris and structures. If contaminated debris and structures do not meet the leachate criteria, these wastes must be decontaminated or treated to at least the leachate criteria levels before disposal in the ERDF. The proposed plan, therefore, should state the method of handling the wastes other than soil if the wastes do not achieve the leachate criteria.

**Waste Acceptance Criteria, page 5, sixth paragraph.** The waste acceptance criteria (WAC) should also be developed considering potential soil exposures. Further, the WAC (leachate concentrations) were developed assuming no cover and should instead be developed considering the effects of an engineered cover on leachate generation. Finally, the text states that much of the waste received at the ERDF will meet WAC and that waste

that does not meet WAC will require treatment before disposal in the ERDF. The text should specify that this treatment will take place at the operable unit, not at the ERDF.

A further and simpler explanation of leachate and its relevance to the facility needs to be provided in the text.

Clarify why the 200 Areas was not considered in development of WAC.

**Summary of Alternatives, page 5.** This section should explain that the purpose of the liners being evaluated is to collect leachate generated from precipitation percolating through the waste-containing soil while cells are open and being filled with waste. The liners are not intended to last for the thousands of years that the waste will remain radioactive.

Also, an explanation of the components of each alternative and their significance should be provided.

**Summary of Alternatives, page 6, first paragraph.** The design alternatives should also include a "baseline alternative", that includes no liner and a nonengineered cover.

**Summary of Alternatives, page 6, third paragraph.** Many of the terms in this paragraph need to be defined in the glossary or explained in the text (e.g., grout batch plant, deep area-fill configuration, footprint).

**Summary of Alternatives, page 6, fourth paragraph.** The disturbed area of the ERDF including the trench, roads, and supporting facilities is estimated to be 650 acres. The text should clearly indicate that the estimated area will contain all wastes derived during the entire life of environmental remediation. This aspect should be emphasized in the proposed plan to explain the impact of the ERDF to the public.

**Evaluation Criteria, pages 6 through 8:** Overall this section should be reduced and information provided should be simplified. It is recommended that this section be combined with the Evaluation of Alternatives section.

**Evaluation Criteria, page 6, overall protection of human health and the environment.** The text indicates that all the retained alternatives will prevent unacceptable direct exposure to waste, assuming the WAC will be implemented. However, an intruder scenario was not considered during the risk assessment or the WAC development. Assuming an intruder scenario is considered, the retained alternatives do not all prevent potential unacceptable exposures.

In addition, it is not clear whether all the retained alternatives include the no action alternative. This discrepancy should be clarified. The no action alternative will not fulfill all of the remedial action objectives.

**Evaluation Criteria, page 7, compliance with ARARs.** This paragraph assesses the alternatives against compliance with applicable or relevant and appropriate requirements (ARAR) criteria. Compliance with location and action-specific ARARs (e.g., preservation of historic sites), however, should also be addressed.

Also, the text states that the timeliness factor was evaluated under implementability. No discussion of this evaluation is included, but should be.

**Evaluation Criteria, page 7, short-term effectiveness.** The text should state that measures could be taken to reduce or minimize short-term risks associated with construction for all the retained alternatives, (e.g., surface water management and dust control).

**Evaluation of Alternatives, General.** Tables in the text facilitate the comparison of the alternatives. A summary table providing a ranking of the alternatives for each criteria should be added to consolidate this information. Additionally, all nine criteria should be included in this section.

**Evaluation of Alternatives, page 8, second paragraph.** The text states that none of the contaminants are predicted to reach groundwater within 10,000 years under current climate conditions. It appears from Table 4-11 in the RI/FS report for the ERDF (DOE 1994a) that travel times to the ERDF boundary are 540 years for carbon -14, technetium-99, antimony, arsenic, chromium-VI, selenium, fluoride, and nitrite, and 5,300 years for 4-chloro-3-methylphenol. If the results of travel time calculations in Table 4-11 are correct, then the prediction regarding none of the contaminants reaching groundwater should be appropriately revised.

The text also states that the predicted long-term risks are the same for all the alternatives after 10,000 years. It is unlikely that risks would be equal for all alternatives if (1) a baseline no liner, nonengineered cover alternative was included and (2) waste acceptance criteria were not established before the comparative risk assessment for the retained alternatives was conducted. The statement should be revised as necessary.

**Evaluation of Alternatives, page 8, fourth paragraph.** In comparing the reliability of the no-action alternative to the retained alternatives, the text should also note that contaminant migration to groundwater and the Columbia River is more likely under the no-action alternative.

**Evaluation of Alternatives, page 8, fifth paragraph.** In the fourth sentence, the text states "Knowledge . . . could be used to predict future impacts in groundwater once the leachate collection is terminated or the trench liner fails." The

underlined portion of the text could be replaced by the phrase "given that the design life of the liner is expected to be significantly less than 10,000 years."

**Evaluation of Alternatives, page 9, fourth paragraph, implementability.** Manmade asphaltic layers are proposed as low-permeability layers in the modified Resource Conservation Recovery Act (RCRA) barrier and the Hanford barrier. The following factors should be evaluated under implementability criteria to demonstrate the functional equivalence of low-permeability layers with RCRA minimum technology requirements (MTR):

- Are the asphaltic layers sufficiently demonstrated for the specific application?
- Will the asphaltic layers require further development before they can be applied full-scale to the type of waste at the ERDF?
- When should the results of the asphaltic layers demonstration test be available for full-scale use?

**Evaluation of Alternatives, page 9, second paragraph, long-term effectiveness and permanence.** The text states that surface barrier reliability in terms of protection against intrusion would be important if institutional controls were no longer in place. This is a key point since it is unlikely that institutional controls can be assumed to be present for 10,000 years.

**Evaluation of Alternatives, page 9, third paragraph, short-term effectiveness.** It is unclear whether worker risk is evaluated during the construction or operation of the facility or both.

Also, the text states that ecological impacts at the ERDF site are the same for all the alternatives and are not included in the evaluation. The summary of the proposed alternative section

should indicate that ecological impacts will be mitigated or habitats restored to the extent possible.

**Implementability, page 10, technical implementability table.**

Ranking of alternatives is shown in parenthesis. The text should explain the way the ranking was done. Alternatives 4 and 8 are ranked equally. Although these alternatives have the same number of layers, the technical implementability of these two alternatives may be different. Alternative 4 may be more difficult to implement than Alternative 8. Ranking should be based on the technical implementability of the layers in each alternative instead of the number of layers.

Also, the discussion concerning compliance with RCRA MTR is confusing and seems more appropriate under and ARAR analysis.

**Comparative Analysis, page 10:** Delete the first sentence.

**Comparative Analysis, page 11:** A discussion of the no action alternative should be included in this section.

**Comparative Analysis, page 11, third bullet.** The low-permeability soil barrier should also be compared with the other surface barriers against the criteria of long-term protection of human health and the environment in terms of intrusion and erosion in the absence of institutional controls.

**Comparative Analysis, page 11, fifth bullet.** Corrective actions are proposed in case potential groundwater impacts are deemed unacceptable due to leachate migration through liners. The type of corrective actions to be initiated should be identified and specified in the proposed plan.

**Comparison of Alternatives, page 11, third bullet.** The text should also indicate that the low-permeability soil barrier

provides less protection against intrusion than the Hanford barrier.

**Summary of the Proposed Alternative, General:** The current proposed alternative design should be a double lined facility with a RCRA compliant cover. This is consistent with the Tri-Party Agreement negotiations and with the conceptual design. It may be proposed that other design alternatives be further evaluated after the initial phase of construction and operation. Data provided during operation of this initial phase will aid in justifying other alternatives.

**Summary of the Proposed Alternative, page 11, first paragraph.** A single liner with low-permeability soil barrier is selected as the preferred alternative based on its effectiveness against infiltration under current climate conditions and less cost. If the climate becomes wetter in the future, a surface barrier similar to the modified RCRA or Hanford barrier is proposed to be installed over the low-permeability soil barrier. Concerns with this approach include the following:

- The current preferred alternative will not meet the long-term effectiveness and permanence criteria against human intrusion and erosion in the absence of institutional controls.
- The total height of the low-permeability soil barrier in the preferred alternative is approximately 15 feet. If a modified RCRA barrier or the Hanford barrier were constructed over the low-permeability soil layer, the total height of the barrier would increase to 20.6 feet or 29.8 feet.
- The modified RCRA barrier also will not meet the long-term effectiveness and permanence criteria against human intrusion.
- If the preferred alternative is intended to provide long-term effectiveness and permanence against infiltration under current climatic conditions, then the 400-centimeter (cm) general fill in the low-permeability soil barrier is redundant. A 60-cm to

150-cm silt and clay mix may be sufficient against infiltration.

- The text should indicate that the low-permeability soil barrier will be very difficult to administratively implement; this cover will not comply with minimum technology requirements (MTR) for caps. After considering changes in the approach used in the RI/FS, a more protective design (e.g., double liner and Hanford barrier) is recommended as the proposed alternative. Information gathered during the initial phase of ERDF operation can be considered for subsequent design modifications.

**Glossary, page 12, definition of incremental cancer risk.** The second sentence of the definition states that an incremental cancer risk of  $1 \times 10^{-6}$  means that, on average, 1 in a million receptors will contract cancer. This should be clarified to explain that this refers to the number of additional cases of cancer that would be expected. Also, "receptor" should be changed to "person" or "human receptor" since the risk to other species is not included.

#### REFERENCES

- DOE 1994a. Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility. DOE/RL-93-99 Decisional Draft. U.S. Department of Energy. March.
- DOE 1994b. Source Inventory Development Engineering Study for the Environmental Restoration Disposal Facility. DOE/RL-12074-29 Rev. 0. U.S. Department of Energy. March.