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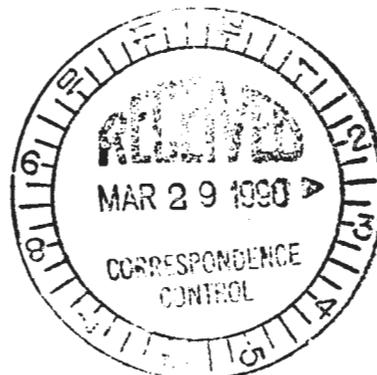
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Richland Operations Office  
P.O. Box 550  
Richland, Washington 99352

START

MAR 23 1990



Mr. Timothy L. Nord  
Hanford Project Manager  
Washington Department of Ecology  
Mail Stop PV-11  
Olympia, Washington 98504-8711

Dear Mr. Nord:

OUTLINE FOR SUBMARINE TRENCH WAIVER REQUEST

Trench 94 of Hanford's 218-E-12B low-level waste burial ground contains Submarine Reactor Compartments (SRCs). A request for waiver of the requirements for trench liners and leachate collection systems for the SRCs will be prepared and submitted to your office. Preparatory to development of the waiver request, a waiver request outline has been written. An information copy of the outline is enclosed. The comments received from Mr. T. M. Michelena, of your staff, have been incorporated into the outline.

Any questions concerning this transmittal can be directed to Mr. A. J. Knepp, U.S. Department of Energy, Richland Operations Office, on (509) 376-1471 or Ms. L. A. Garner, Westinghouse Hanford Company, on (509) 376-5969.

Sincerely,

*R. D. Izatt*  
R. D. Izatt, Director  
Environmental Restoration Division  
Richland Operations Office

*R. E. Lerch*  
R. E. Lerch, Manager  
Environmental Division  
Westinghouse Hanford Company

ERD:AJK



Enclosure:  
Outline for Waiver Request

cc w/encl:  
R. Benze, Department of the Navy  
G. Haselberger, EPA, Region 10



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OUTLINE FOR LINER SYSTEM AND LEACHATE COLLECTION AND REMOVAL SYSTEM  
WAIVER REQUEST FOR 218-E-12B, TRENCH 94  
FEBRUARY 22, 1990

1.0 INTRODUCTION

1.1 Scope - This section will describe the scope of the waiver request. The request for a waiver from the liner and leachate collection and removal system is for Trench 94 of the 218-E-12B low level burial ground on the Hanford Site. This trench will be maintained exclusively for burial of Navy Submarine Reactor Compartments (SRCs).

1.2 Background - This section will contain a brief discussion of the history of the site and disposal of SRCs. Reference will be made to past environmental documentation for Trench 94, namely the "Final Environmental Impact Statement on the Disposal of Decommissioned, Defueled Naval Submarine Reactor Plants," dated 1984. The request will summarize the discovery of Polychlorinated Biphenyls (PCBs) in the SRCs. The subsequent investigation resulting in the regulation of the SRCs due to lead (shielding) and small quantities of PCBs will be included. The lead is regulated by the Washington Administrative Code 173-303 and the PCBs by the Toxic Substances Control Act. The "Reactor Compartment Disposal Package Hazardous Material Investigation," published by the Puget Sound Naval Shipyard will be referenced.

2.0 BASIS FOR WAIVER REQUEST - This section will discuss the regulatory requirements to be addressed by the waiver request, the strategy to be employed for addressing these requirements, and the performance objectives and criteria to be used for demonstrating that these requirements have been met.

2.1 Regulatory Requirements - This section will summarize the regulatory requirements applicable to Trench 94. These requirements include:

- WAC 173-303-665(2)(a) - This regulation defines requirements for a dangerous waste landfill liner and leachate collection and removal system;

- WAC 173-303-665(2)(b) - This regulation defines the method for obtaining an exemption from the dangerous waste landfill liner and leachate collection and removal system requirement (i.e., demonstration that "alternate design and operating practices, together with location characteristics, will prevent the migration of any dangerous constituents into the ground water or surface water at any future time");
- WAC 173-303-806(4)(h)(ii)(A) - This regulation describes documentation necessary for obtaining the exemption from the dangerous waste landfill liner and leachate collection and removal system requirements;
- 40 CFR 264.301(c) - This regulation defines requirements for a hazardous waste landfill double liner and leachate collection and removal system, which are also referred to as minimum technological design requirements. These requirements are not currently applicable, but are expected to soon be adopted by Ecology as part of the Hazardous and Solid Waste Amendments of 1984 (HSWA) authorization;
- 40 CFR 264.301(d) - This regulation defines the method for obtaining exemptions from the hazardous waste landfill liner and leachate collection and removal system requirements (i.e., demonstration that "alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as such liners and leachate collection systems");
- 40 CFR 761.75(b) - This regulation defines requirements for low permeability soils or liner, and a leachate collection system in a chemical waste landfill;
- 40 CFR 761.75(c)(4) - This regulation defines the method for obtaining a waiver from chemical waste landfill liner and leachate collection system requirements (i.e., demonstration that alternate design and operating practices will "not present an unreasonable risk of injury to health or the environment from PCBs");
- DOE Order 5820.2A, Chapter III, Section 3.b defines requirement for radiological performance assessment of the low level radioactive waste disposal system.

2.2 Approach to Waiver Request - This section will discuss the overall strategy to be used for meeting the regulatory requirements. The waiver request will demonstrate that the requirements of WAC 173-303-665, 40 CFR 264.301(c) (minimum technological design requirements), and 40 CFR 761.75 (TSCA) are met. The fundamental basis for the waiver request will be that the proposed alternate design and operating practices will perform better than the EPA minimum technological design. Containment of lead shielding and PCBs in the submarine hulls (proposed alternate design) will be compared to disposal of lead shielding and PCBs in a minimum technological design trench. For these performance comparisons, the submarine hulls will not be considered part of the minimum technological design.

Demonstration of performance better than the minimum technological design will be assumed to meet the requirement for "no migration" under WAC and no "unreasonable risk of injury to health or the environment" under TSCA. The basis for this assumption is:

- The minimum technological design is more protective than the WAC design in that it requires double liners and two leachate collection systems. Performance better than the minimum technological design, therefore, will also be better than the WAC design.
- The WAC regulations do not define what is meant by "no migration at any future time." From a technical standpoint, no migration at any future time is not possible. Therefore, "no migration" will be defined to mean no migration at levels above those which would result from the more protective minimum technological design, and "any future time" will be defined as the effective life of the minimum technological design.
- The minimum technological design is more protective than the design required by TSCA. Therefore, the risk associated with the minimum technological design will be less than the risk associated with the TSCA design. Performance better than the minimum technological design will not result in "an unreasonable risk of injury to health or the environment."

2.3 Performance Objectives and Criteria - This section will define performance objectives and criteria for determining that objectives have been met. Key elements to be addressed are:

- A performance objective for the minimum technological design's liner and leachate collection and removal system is to collect and remove leachate from the landfill during the active life and post-closure care period. A performance objective for the proposed alternate design is to exceed the performance of the minimum technological design. The criterion for meeting this objective is to be based on the prevention of leachate generation during the active life and post-closure care period.
- A performance objective for alternate landfill design and operating practices is to prevent "migration of any dangerous constituents into the ground water or surface water at any future time." The criterion for meeting this objective is to be based on containment of dangerous constituents within the SRCs for a period exceeding the estimated effective life of the minimum technological design.
- Location characteristics, nature of waste, and cover performance will be the primary factors affecting the performance objective of preventing long-term migration of dangerous constituents (i.e., liner and leachate collection and removal systems are not designed to prevent long-term migration of contaminants).
- For the purpose of performance evaluations provided in this waiver request, the "active life" will be defined as the period preceding installation of a final cover.
- For the purpose of performance evaluations provided in this waiver request, the post-closure care period will be defined as 30 years.

### 3.0 SITE DESCRIPTION

- 3.1 General Description - This section will contain a brief general description of the site (e.g., location, topography, etc). Reference will also be made to more detailed discussions provided in sections of the Low Level Burial Grounds Dangerous Waste Permit Application.
- 3.2 Hydrogeologic Setting - This section will contain a brief discussion of site geology, hydrogeology, and geochemistry. Reference will be made to more detailed descriptions contained in the Low Level Burial Grounds Dangerous Waste Permit Application.
- 3.3 Facility Design and Operation - This section will contain a brief discussion of Trench 94 design and construction. Facility operations (e.g., trench excavation, backfill, etc.) will also be discussed. Emphasis will be placed on those design and operating features relevant to the waiver request (i.e., those affecting leachate generation and migration). Reference will be made to the sections of the Low Level Burial Grounds Dangerous Waste Permit Application where more detailed discussions are provided.

### 4.0 NATURE AND QUANTITY OF WASTE

- 4.1 Waste Characteristics - This section will discuss the hazardous waste contents of the SRCs (i.e. the lead and PCB material which will remain in the SRCs at final disposal). The waste will be characterized in regulatory terms (e.g., designated as extremely hazardous waste per WAC 173-303 because of the presence of greater than 100 tons of lead shielding in each SRC).
- 4.2 Barrier Description - This section will describe the SRC hulls (i.e., hull thickness, material types, corrosion protection, weld specifications.)

### 5.0 PERFORMANCE EVALUATION

- 5.1 Introduction - This section will briefly describe the purpose of the performance evaluation, which is to demonstrate that the criteria identified in Section 2.3 are met. This section will also discuss the basic elements of performance evaluation (e.g., leachate generation rates and constituent concentrations) and identify important factors affecting performance.

- 5.2 Evaluation of Factors Affecting Performance - This section will evaluate those factors specific to Trench 94 which are needed to evaluate performance of a minimum technological design and the proposed alternate design and operating practices.
- 5.2.1 Hull Integrity - This section will discuss the integrity of the SRC hull and its expected lifetime after disposal in Trench 94. An estimate will be made of the time required for exposure of lead to the environment.
- 5.2.2 Leachate Concentration - This section will discuss lead corrosion rates, concentration of lead in leachate, and geochemistry effects based on the assumption that the SRC hull no longer encapsulates the lead. Similar discussion will also be provided for PCBs.
- 5.2.3 Cover Performance - This section will discuss the performance of the proposed final cover. An estimate will be made of the infiltration rate through the cover. This section will also address the long term stability of the cover, especially as it relates to subsidence if the hulls are not filled.
- 5.3 Performance of Proposed Design and Operating Practices During Active Life - This section will evaluate the performance of the proposed design and operating practices during the active life (i.e., before cover is installed). Estimates will be made of leachate quantity and quality during the active life.
- 5.4 Performance of Proposed Design Following Active Life - This section will evaluate the performance of the proposed design during and after the post-closure care period. Estimates will be made of leachate quantity and quality and contaminant migration during this period. Resulting concentrations in ground water and surface water for the period of the evaluation will be estimated.
- 5.5 Performance of Minimum Technological Design During Active Life - This section will evaluate the performance of the minimum technological design during the active life (i.e., before cover is installed). Estimates will be made of leachate quantity and quality during the active life. The evaluation will not consider the effect of the submarine hull and end plates in isolating the lead shielding from the environment. That is, leachate quantity and quality will be estimated as though the lead shielding were placed directly in a minimum technological design trench.

5.6 Performance of the Minimum Technological Design Following Active Life - This section will evaluate the performance of the minimum technological design during and after the post-closure care period. The results of this evaluation will then be compared with the results of the evaluation of the proposed alternate design and operating practices to determine whether the criteria for the waiver are met. Estimates will be made of leachate quantity, quality and migration following the active life. Resulting concentrations in ground water and surface water during the period under evaluation will be estimated.

6.0 REQUEST FOR EXEMPTION - This section will request an exemption from the requirements for a liner and leachate collection and removal system. This section will summarize how the alternative design, operating practices, and location characteristics prevent future migration of dangerous constituents to ground water or surface water. The effectiveness of the proposed alternate design and operating practices in meeting the criteria established in Section 2.3 will be demonstrated. Performance better than that of the minimum technological design will also be demonstrated.

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<b>Subject</b> OUTLINE FOR SUBMARINE TRENCH WAIVER REQUEST		

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