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May 1995

DIVISION OF ENVIRONMENTAL QUALITY

Idaho National Engineering Laboratory

Proposed Plan for Operable Units 5-05 and 6-01

Stationary Low-Power Reactor 1 and the Boiling Water Reactor Experiment I Burial Grounds

No Action Sites in Operable Units 5-01, 5-03, 5-04, and 5-11

Idaho National Engineering Laboratory

Public Comment Period - May 3 to June 3, 1995

(*Note:* Technical and administrative terms are used throughout this Proposed Plan. When these terms are first used, they are printed in ***bold italics***. Explanations of these terms, document references, and other helpful notes are provided in the margins.)

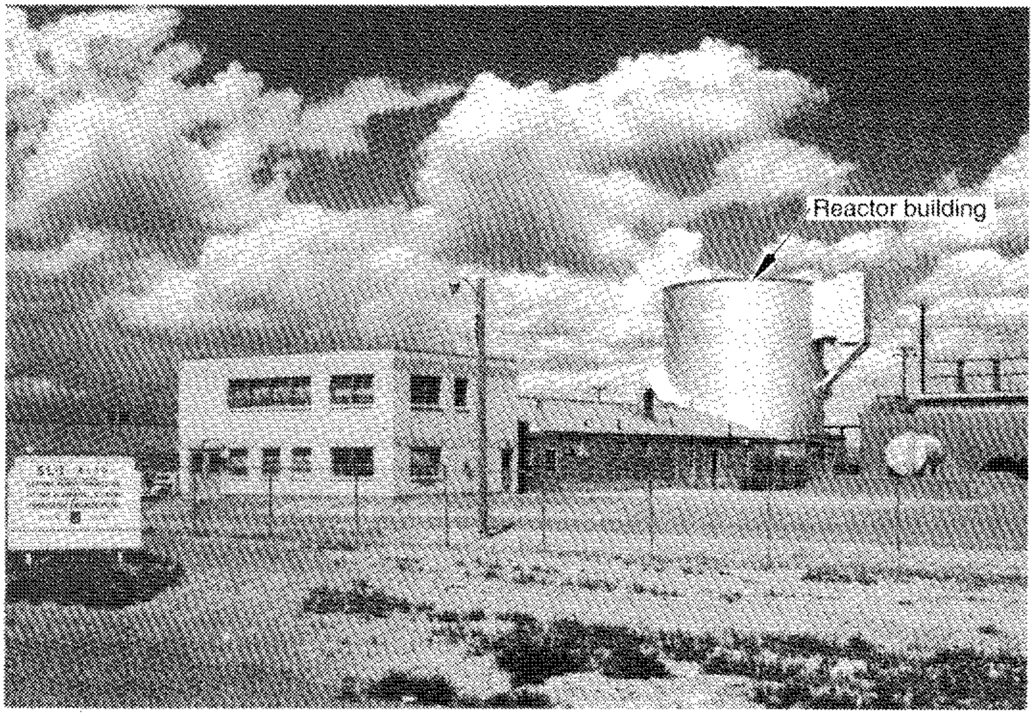

Photo of SL-1 prior to the 1961 accident.

Introduction

The purpose of this ***Proposed Plan*** is to summarize information and to seek comments on remedial action alternatives proposed for two sites located in the southern portion of the Idaho National Engineering Laboratory (INEL) (see Figure 1) – the Stationary Low-Power Reactor No. 1 (SL-1) and Boiling Water Reactor Experiment I (BORAX-I) burial grounds – and for 10 "No Further Action" sites in Operable Units 5-01, 5-03, 5-04, and 5-11. Details of the "No Further Action" sites are discussed on pages 20 through 25 of this Proposed Plan. The SL-1 burial ground is identified as Operable Unit 5-05, and BORAX-I is identified as Operable Unit 6-01. Each operable unit is the burial site of radioactive debris and contaminated soil resulting from the destruction of a small nuclear reactor at each location.

Inside This Plan

Public Meetings/ Briefings*

Idaho Falls - ***Engineering Research Office Building***
Tuesday, May 16

Boise - ***Earl Chandler Building (Division of Environmental Quality)***
Wednesday, May 17

Moscow - ***Palouse Empire Mall***
Thursday, May 18

Briefings for other communities can be arranged by calling the INEL's toll-free number at (800) 708-2680.

*** See page 26 for details.**

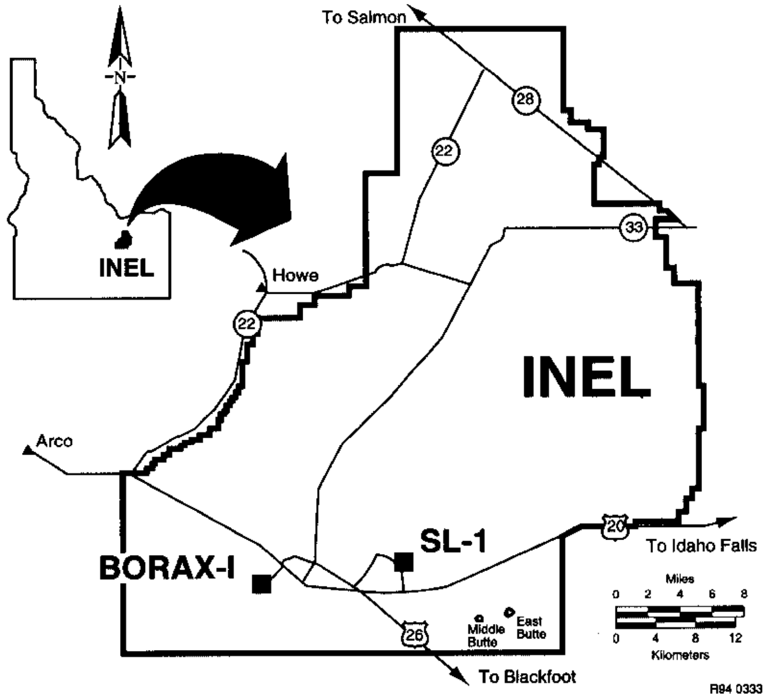

Figure 1. Location of the SL-1 and BORAX-I burial grounds at the Idaho National Engineering Laboratory.

This Proposed Plan outlines the results of the ***remedial investigation*** conducted for the burial grounds, summarizes the results of the ***baseline risk assessment***, summarizes the ***remedial action alternatives*** identified in the ***feasibility study***, and discusses the selection of preferred alternatives for remediation of the two burial grounds. The primary reason for the remedial investigation/feasibility study is the concern that the radioactive contamination could adversely impact human health and the environment.

Agency Involvement

This document was prepared by the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Health and Welfare (IDHW), collectively referred to as "the agencies." The agencies are presenting this Proposed Plan as a component of their public participation responsibilities under Section 117(a) of the ***Comprehensive Environmental Response, Compensation, and Liability Act*** (CERCLA), commonly known as the "Superfund Program." This document also complies with a similar component of the National Environmental Policy Act of 1969 that DOE must satisfy for these sites. After the public comment period has ended and the comments have been reviewed and considered, the agencies will document final remedial action decisions for the burial grounds in a ***Record of Decision***. Additional information may be found in the document entitled *Remedial Investigation/Feasibility Study Report for Operable Units 5-05 and 6-01 (SL-1 and BORAX-I Burial Grounds)* - henceforth referred to as the investigation report.

Recommended Alternative

The recommended remedial action alternative for both burial grounds is to contain the areas by capping them with an engineered cover. Alternatives considered were no action, limited action involving access restrictions and runoff control, containment by capping with various cap designs, and complete removal of the contaminated material using conventional or remote-controlled excavation techniques followed by disposal at the Radioactive Waste Management Complex. A 5-year review of the remedial

Proposed Plan - document requesting public input on a proposed remedial alternative (cleanup plan).

remedial investigation - an environmental investigation which identifies the nature and extent of contamination at a site. Also provides an assessment of the potential risks associated with a site.

baseline risk assessment - an assessment required by CERCLA to evaluate potential risks to human health. This assessment estimates risks/hazards associated with existing and/or potential human exposures to contaminants at an area.

remedial action alternatives - the options available for a site cleanup.

feasibility study - an engineering study which provides an analysis of cleanup alternatives based on information gathered during the remedial investigation.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - A federal law (also known as "Superfund") implemented by 40 CFR 300 et seq. that provides a comprehensive framework to deal with past releases or abandoned hazardous materials.

Record of Decision - a public record documenting the final determination of the selected remedy. Records of Decision follow the consideration of public comment, and apply to both the agencies' decisions under CERCLA and DOE's compliance with the National Environmental Policy Act; INEL CERCLA decisions are signed by the Regional Administrator of EPA Region 10, DOE, and the state of Idaho.

alternative chosen for SL-1 and BORAX-I will be conducted to ensure the preferred remedy continues to be protective of human health and the environment.

Containment of the burial grounds by capping with an engineered cover is recommended because it is believed to provide the best balance of trade-offs among the alternatives. The cap design for each site would protect human health and the environment by providing shielding from radiation exposure, and inhibiting human, animal, and plant intrusion into the waste. This action would comply with applicable federal and state requirements.

All of the alternatives considered are explained in the section entitled Summary of Alternatives (page 12).

Community Acceptance

Community acceptance is one of the nine criteria (see Evaluation of Alternatives; page 16) the agencies must evaluate during the process of selecting remedial actions for the SL-1 and BORAX-I burial grounds. The agencies can gauge the degree of community acceptance by (1) opening dialogue with citizens concerning the results of the investigation and (2) encouraging citizens to participate by commenting on the remedial alternatives. This interaction is critical to the CERCLA process and to making sound environmental decisions.

Although this plan identifies use of an engineered cap as the agencies' preferred alternative, the public is encouraged to review and comment on all of the alternatives. Details on the alternatives developed for this project can be found in Sections 10 - 12 of the investigation report.

Remedies cannot be selected until after the comments received during the public comment period have been reviewed and analyzed. The agencies will consider all public comments on this Proposed Plan in preparing the Record of Decision. All written and verbal comments will be summarized and addressed in the ***Responsiveness Summary*** section of the Record of Decision, which is scheduled for completion in January 1996. Depending on the comments received, the final remedies selected and presented in the Record of Decision could be different from the preferred alternative presented in this plan.

Site Background

The INEL is an 890-square-mile DOE facility on the Eastern Snake River Plain in southeastern Idaho whose primary mission is the integration of engineering, applied science, and operations in an environmentally conscious, safe, and cost-effective manner. The Eastern Snake River Plain is a relatively flat, semiarid sagebrush desert. The plain is bounded on the north and west by the Lost River, Lemhi, and Bitterroot mountain ranges. Drainage around and within the Eastern Snake River Plain recharges the Snake River Plain Aquifer. The top of the aquifer is about 610 feet below the SL-1 burial ground and about 580 feet below the BORAX-I burial ground.

In November 1989, the INEL was placed on the ***National Priorities List***, which identifies hazardous substance sites requiring investigation. Under CERCLA, the risks posed by hazardous substances at National Priorities List sites must be evaluated, and if necessary, appropriate remediation methods must be implemented to reduce risks to acceptable levels. The investigation of hazardous substance sites at the INEL is implemented under a ***Federal Facility Agreement and Consent Order***, which was negotiated by the agencies and signed in December 1991. A remedial investigation/

How You Can Participate

Whether you are new to the INEL and are reading this type of document for the first time, or you are familiar with the Superfund process, you are invited to:

- ***Read** this proposed plan and review additional documents in the Administrative Record file*
- ***Call** the INEL's toll-free number at (800) 708-2680 to ask questions, request information, or make arrangements for a briefing*
- ***Attend** a public meeting listed on page 26 and give verbal comments*
- ***Submit** written comments (see postage-paid comment form on back cover) by June 3, 1995*
- ***Contact** state of Idaho, EPA Region 10, or DOE project managers (see pages 11, 12, and 13)*

More INEL Information

General information concerning INEL's mission and its major programs can be found in INEL Information Repositories listed on page 10. Visit one of the repositories or call (800) 708-2680 to ask about INEL activities or request background information.

Responsiveness Summary - the part of the Record of Decision that summarizes and provides responses to comments on the proposed plan received during the public comment period.

National Priorities List - a formal listing of the nation's worst hazardous waste sites as established by CERCLA that have been identified for possible remediation. Sites are ranked by the EPA based on their potential for affecting human health and the environment.

Federal Facility Agreement and Consent Order - an agreement between the EPA, state of Idaho, and DOE to evaluate waste disposal sites at the INEL and perform remediation if necessary.

operable unit - an area or areas with distinct characteristics or similar wastes.

Waste Area Group - one of the 10 permanent administrative management areas at the INEL developed in the Federal Facility Agreement and Consent Order.

prompt critical nuclear reaction - an accidental and uncontrolled nuclear reaction.

feasibility study and any required cleanup of specific ***operable units*** at the INEL are guided by the agreement and its associated Action Plan. These documents provide procedures and schedules to ensure that investigations are conducted in compliance with federal and state environmental laws.

To better manage environmental investigations, the INEL has been divided into 10 ***waste area groups***. Each group has been divided into operable units to expedite the investigations associated with remedial activities. Under this management system, Waste Area Group 5 includes the SL-1 burial ground. BORAX-I is assigned to Waste Area Group 6; however, due to similarities between the two sites and to expedite the remediation process, the decision was made by the agencies to evaluate the BORAX-I burial ground in conjunction with the SL-1 burial ground investigation.

SL-1 Site Description

The SL-1 was a small nuclear power plant designed for the military to generate electric power and heat for remote arctic installations. The reactor was operated from August 1958 until January 3, 1961, as a test, demonstration, and training facility. On the evening of January 3, 1961, the SL-1 reactor accidentally achieved a ***prompt critical nuclear reaction***, resulting in a steam explosion that destroyed the reactor. The accident resulted in the deaths of the three operators on duty. The reactor vessel and building were severely damaged and highly contaminated, and a massive cleanup operation ensued to dismantle and dispose of the reactor and building.

A burial ground was constructed approximately 1,600 feet northeast of the original site of the reactor. This was done to minimize radiation exposure to the public and site workers that would have resulted from transport of contaminated debris from SL-1 to the Radioactive Waste Management Complex over 16 miles of public highway. Original cleanup of the site took about 18 months. The entire reactor building and contaminated materials from nearby buildings were disposed in the burial ground. The majority of contaminated materials consisted of soils and gravel that were contaminated during cleanup operations.

Recovered portions of the reactor core, including the fuel and all other parts of the reactor that were important to the accident investigation, were taken to the Test Area North for study. After the accident investigation was complete, the reactor fuel was sent to the Idaho Chemical Processing Plant for reprocessing. The reactor core minus the fuel, along with the other components sent to Test Area North for study, were eventually disposed at the Radioactive Waste Management Complex.

The SL-1 burial ground consists of three excavations, in which a total volume of 99,000 cubic feet of contaminated material was disposed. The excavations were dug as close to basalt as the equipment used would allow, and range from 8 to 14 feet in depth. At least 2 feet of clean backfill was placed over each excavation. Shallow mounds of soil, one over two excavations and one over the third excavation, were added at the completion of cleanup activities in September 1962. Operable Unit 5-05 is defined as the surface and subsurface soils and debris within the 600- by 300-foot SL-1 burial ground exclusion fence, and surface contamination in the 1,200- by 1,500-foot area encompassing the burial ground. Remedial action at SL-1 may include consolidation of surface soils within the 1,200-by 1,500-foot area, depending on radiological survey data acquired during remedial design. Other residual contamination from the SL-1 accident is being investigated in WAG 5 under Operable Unit-12, site code ARA-23.

In the years since the SL-1 accident, numerous radiation surveys and cleanup activities of the surface of the burial ground and surrounding area have been performed. Results indicate that cesium-137 and its ***progeny*** are the primary contaminants in surface soils. During a survey of surface soil in June 1994, "hot spots," areas of higher radioactivity, were found within the burial ground, with activities ranging from 0.1 to 50 ***mR/hour***. On November 17, 1994, the highest radiation reading measured at 2.5 feet above the surface at the SL-1 burial ground was 0.5 mR/hour; local background radiation was 0.2 mR/hour.

Today, the SL-1 burial ground is defined by a three-strand, barbed-wire exclusion fence posted with radiological control signs. Inside the burial ground, the ends of the excavations are identified by concrete markers. The surface of the burial ground is covered with various grass species. The two mounds and several minor depressions due to subsidence are visible within the fenced area. A second radiological control fence encompasses the burial ground, a larger contaminated surface soil area, and the Auxiliary Reactor Area-I (ARA-I) and -II facilities. The fences, posted with radiological control signs, and strict access restrictions protect INEL workers and the public from exposure.

progeny - the decay product of a radionuclide.

mR/hour - the amount of ionizing radiation in milliroentgens to which an individual would be exposed per hour of exposure.

BORAX-I Site Description

The BORAX-I reactor was a small experimental reactor used in the summer months of 1953 and 1954 for testing boiling water reactor technology. In 1954, the design mission of BORAX-I was completed, and the decision was made to make one final test, which resulted in the intentional destruction of the reactor. The destruction of the reactor contaminated approximately 84,000 square feet of the surrounding terrain. Immediately following the final test of the BORAX-I reactor, much of the radioactive debris, including some fuel residue, was collected and buried on site in the reactor ***shield tank***. Recovered fuel fragments and fuel residue were sent to the Idaho Chemical Processing Plant and Oak Ridge National Laboratory, Tennessee. Reusable equipment associated with the reactor was successfully decontaminated and used in the construction of BORAX-II. However, the cleanup did not sufficiently reduce the radioactivity at the site; therefore, the 84,000-square-foot contaminated area was covered with approximately 6 inches of gravel to reduce radiation levels at the ground surface.

shield tank - a container of water around a reactor that provides shielding from radiation generated during fission.

Buried materials at the site consist of unrecovered uranium fuel residue, irradiated metal scrap, and contaminated soil and debris. Part of the waste was buried in the bottom half of the shield tank; the top half of the tank was collapsed into the bottom and the void space was filled with debris. The burial ground is contained within the foundation of the BORAX-I installation – the dimensions of which are 18 x 32 x 11 feet. A mounded gravel and dirt cover approximately 5 feet high and 30 feet in diameter is centered over the buried shield tank. Operable Unit 6-01 includes the buried debris, as well as the 84,000 square feet of contaminated surface soil. Remedial action at BORAX-I may include consolidation of surface soils of the 84,000-square-foot area, depending on radiological survey data acquired during remedial design.

Field radiation surveys conducted in 1978 and 1980 detected radiation at about three times background levels in the central portion of the gravel-covered 84,000-square-foot area south-southeast of the buried reactor. Radiation in adjacent areas was at background levels. Surface and subsurface soil sampling of the 84,000-square-foot gravel-covered area in 1978 and 1980 indicated that radioactive contamination exists and is highest at a depth of approximately 6 inches (below the gravel), at the original ground surface. Ongoing monitoring of the site through the use of radiation dosimeters shows that radiation levels are slightly above background levels. On November 18, 1994, the radiological field measured at 2.5 feet above the surface of the BORAX-I burial ground was 0.1 mR/hour; local background radiation was also 0.1 mR/hour.

Today, the ground surface at the site looks very much like the surrounding terrain. Abundant native vegetation has grown over the mound and surrounding area. A large stake about 5 feet tall marks the reactor location. A 6-foot high chain-link fence surrounds the burial ground, forming an enclosed area approximately 100 feet on each side. The contaminated surface soil area outside of the chain-link fence is bounded by a two-wire exclusion fence. The fences, posted with radiological control signs, and strict access restrictions protect INEL workers and the public from unacceptable exposures.

Summary of the Remedial Investigation

The remedial investigation for the SL-1 and BORAX-I burial grounds included a number of tasks designed to identify the contaminants associated with the two sites. These tasks included searching historical records, reviewing sampling and radiological survey data, and modeling estimates of the radionuclides in the subsurface at each site to support the baseline risk assessment. No new sampling was conducted as part of this remedial investigation; existing data were judged sufficient by the agencies to support recommendations for future remedial actions at both sites.

Estimates of the types and concentrations of radionuclides buried at the sites were generated through the use of computer models. Input to the computer models consisted of the initial reactor fuel loads and reactor operating histories (length of time and power level of operation). If specific information was not available, input values for the models were biased to generate the greatest contaminant concentration and risk estimates. The models produced lists of radionuclides, along with each radionuclide's maximum concentration. The estimated concentrations were reduced to account for the known recovery of 93% of the fuel at SL-1 and 12% of the fuel at BORAX-I. The remaining fuel inventories were assumed present in the burial grounds.

Summary of Site Risks

A baseline risk assessment was conducted to evaluate current and future potential risks to human health. The assessment considered the carcinogenic health effects that could result from exposure to the contaminants under current occupational and future occupational and residential land-use scenarios. The health effects differ depending on whether the sites are used for light industry or residential development. Effects could result from direct exposure to radiation, from inhalation of contaminated dust, or from ingestion of contaminated soil.

Human Health Evaluation

Active institutional control of low-level radioactive waste disposal sites on the INEL is assumed for a minimum of 30 years following site closure. Institutional controls may include restricting land use, controlling public access, posting signs, constructing fences or other barriers, and monitoring the environment. Therefore, the human health evaluations included scenarios wherein exposures to the contaminants did not begin until the year 2024, 30 years after 1994.

Radionuclides are the only contaminants of concern. Carcinogenic (cancer causing) risks are generally a much greater concern than noncarcinogenic risks from radionuclides. Therefore, the baseline risk assessment focused on a ***quantitative assessment*** of carcinogenic risks. Noncarcinogenic risks were subjected to a ***qualitative evaluation*** and eliminated from further assessment. See Section 6 of the investigation report for additional information.

quantitative assessment - an assessment supported with measured, modeled, or estimated numerical data.

qualitative evaluation - an assessment that utilizes general characteristics and non-numerical information.

Exposure Scenarios

For each of the two sites, 10 potential exposure scenarios (five residential scenarios and five occupational scenarios) were examined in the baseline risk assessment. The five residential scenarios include intrusive residents (who expose the waste) on the site in 2024 and 2094 (30 and 100 years from 1994), nonintrusive residents (who leave wastes undisturbed but live on the surface above the wastes) in 2024 and 2094, and a subsistence farmer on the site in 2094. The five occupational scenarios include daily industrial use without restrictions in 1994, two 1994 site-specific evaluations to more realistically assess current occupational conditions at the site, and daily industrial use 30 and 100 years in the future in the years 2024 and 2094. Detailed descriptions of all scenarios appear in Section 6.2.1 of the investigation report.

Calculation of Risk

Carcinogenic risk is expressed as the product of the total expected lifetime exposure to a particular contaminant and the ***slope factor*** for the contaminant. The calculated product, referred to as an ***excess risk***, indicates the potential increase in the probability of contracting cancer as a result of exposure to the carcinogenic contaminant. As described in the ***National Contingency Plan***, contaminants present in sufficient concentrations to create an excess lifetime cancer risk within the range of 1 chance in 10,000 to 1 chance in 1,000,000 may be considered acceptable by the EPA.

The baseline risk assessment in the investigation report is presented in two parts: (1) an evaluation of ***deterministic risk*** based on standard EPA methodology and (2) an evaluation of the uncertainty associated with the mean risk using ***probabilistic risk assessment***. The first quantity is a point estimate that represents a quantified upper bound of risk. Deterministic risks are used by decision makers to define the estimated excess risk that must be addressed in remedial decisions. Probabilistic methods are used in the second evaluation to quantify the uncertainty associated with the deterministic risk. These methods provide a more complete understanding of the excess risk potential at a site by examining the likelihood of over- or under-estimation of risk. Section 6 of the investigation report contains tables and graphs to illustrate the risks for all assessed scenarios.

Results of the SL-1 Burial Ground Risk Assessment

The results of the risk assessment for three of the 10 scenarios (one current, one 30-year, and one 100-year scenario) examined in the baseline risk assessment are given in Table 1. Any radionuclide suspected of contributing to excess risk at either site was assessed. The contaminants presenting a potential excess risk greater than 1 in 10,000,000 at SL-1 are listed in the sidebar. Excess risk values are higher than the range of risks deemed acceptable by the EPA. The greatest risks are from cesium-137 plus progeny in the external exposure pathway.

The site-specific occupational scenario uses the assumption that the only activities at SL-1 will be radiological monitoring, requiring a maximum of 5 days a year over the next 3 years, resulting in a total excess cancer risk of 6 in 10,000. The residential baseline risk assessment is founded on the assumptions that no remedial actions are performed at the site, the site is released from DOE control for residential use 30 years from 1994, and the resident is directly exposed to the waste 24 hours a day, 350 days per year for 30 years. In such circumstances, people could be exposed to direct radiation fields, which would statistically increase the excess cancer risk. The excess risk associated with this hypothetical chain of events would be 5 in 10 for the residential scenario in the year 2024. The subsistence farmer scenario is used to model

SL-1 Contaminants of Concern

Americium-241	
Antimony-126	
Antimony-126m	
Cesium-134	
Cesium-137	(plus progeny)
Europium-152	
Europium-154	
Europium-155	
Krypton-85	
Neptunium-237	(plus progeny)
Plutonium-238	
Plutonium-239	
Plutonium-240	
Radium-226	(plus progeny)
Radium-228	(plus progeny)
Samarium-151	
Strontium-90	(plus progeny)
Technetium-99	
Thorium-228	(plus progeny)
Thorium-230	
Thorium-232	
Tin-126	
Tritium	
Uranium-234	(plus progeny)
Uranium-235	(plus progeny)

slope factor - a conservatively estimated value of an individual's probability of developing cancer as a result of a lifetime exposure to a particular level of a potential carcinogen. EPA sources use standardized slope factors for various chemicals.

excess risk - a possibility of contracting cancer above the national average.

National Contingency Plan - regulations implementing response actions under CERCLA, including the procedures for emergency response to releases of hazardous substances.

deterministic risk - a point estimate of risk based on conservative exposure and default values; used to quantify an upper bound on potential risk.

probabilistic risk assessment - statistical techniques used to quantify the uncertainty associated with deterministic risks.

Table 1. Deterministic risks for three selected exposure scenarios.

	Site-specific current occupational	30-year future residential	100-year future subsistence farmer
SL-1			
External exposure	6 in 10,000	5 in 10	1 in 1,000
Ingestion of soil	6 in 100,000,000	9 in 10,000	4 in 10,000,000
Inhalation of dust	9 in 10,000,000,000	8 in 10,000,000	2 in 1,000,000
Ingestion of groundwater	N/A[a]	1 in 1,000,000	N/A
Ingestion of plants	N/A	N/A	1 in 100,000
Ingestion of meats	N/A	N/A	4 in 100,000
Ingestion of milk	N/A	N/A	1 in 100,000
Total scenario risk[b]	**6 in 10,000**	**5 in 10**	**1 in 1,000**
BORAX-I			
External exposure	3 in 100,000	3 in 100	5 in 1,000
Ingestion of soil	4 in 100,000,000	7 in 10,000	2 in 1,000,000
Inhalation of dust	1 in 1,000,000,000	9 in 10,000,000	7 in 100,000,000
Ingestion of groundwater	N/A	3 in 1,000,000	N/A
Ingestion of plants	N/A	N/A	1 in 10,000
Ingestion of meats	N/A	N/A	1 in 10,000
Ingestion of milk	N/A	N/A	4 in 100,000
Total scenario risk[b]	**3 in 100,000**	**3 in 100**	**6 in 1,000**

a. N/A = Not applicable for the described scenario.

b. Cesium-137 and its progeny are the primary contributing radionuclides.

receptor location - location of a modeled groundwater well from which hypothetical human consumers obtain drinking water.

an on-site resident raising and consuming crops 100 years in the future in the year 2094, with a total excess cancer risk of 1 in 1,000.

For SL-1, the only radionuclides predicted to reach the aquifer in concentrations of potential concern were tritium and technetium-99, with associated risks of 2 in 10,000,000 and 6 in 10,000,000. The ***receptor location*** used in the modeling is indicated in Figure 2. Summed with the risks from the remaining radionuclides (listed in the sidebar on page 7), the total risk due to groundwater ingestion associated with SL-1 is 1 in 1,000,000.

Total excess risks for the 10 scenarios assessed in the baseline risk assessment for the SL-1 burial site range from 6 in 10,000 to 5 in 10. Details can be found in Section 6 of the investigation report.

Results of the BORAX-I Burial Ground Risk Assessment

The results of the risk assessment for three of the ten scenarios examined in the baseline risk assessment for BORAX-I appear in Table 1. Any radionuclide suspected of contributing to excess risk at either site was assessed. The contaminants presenting

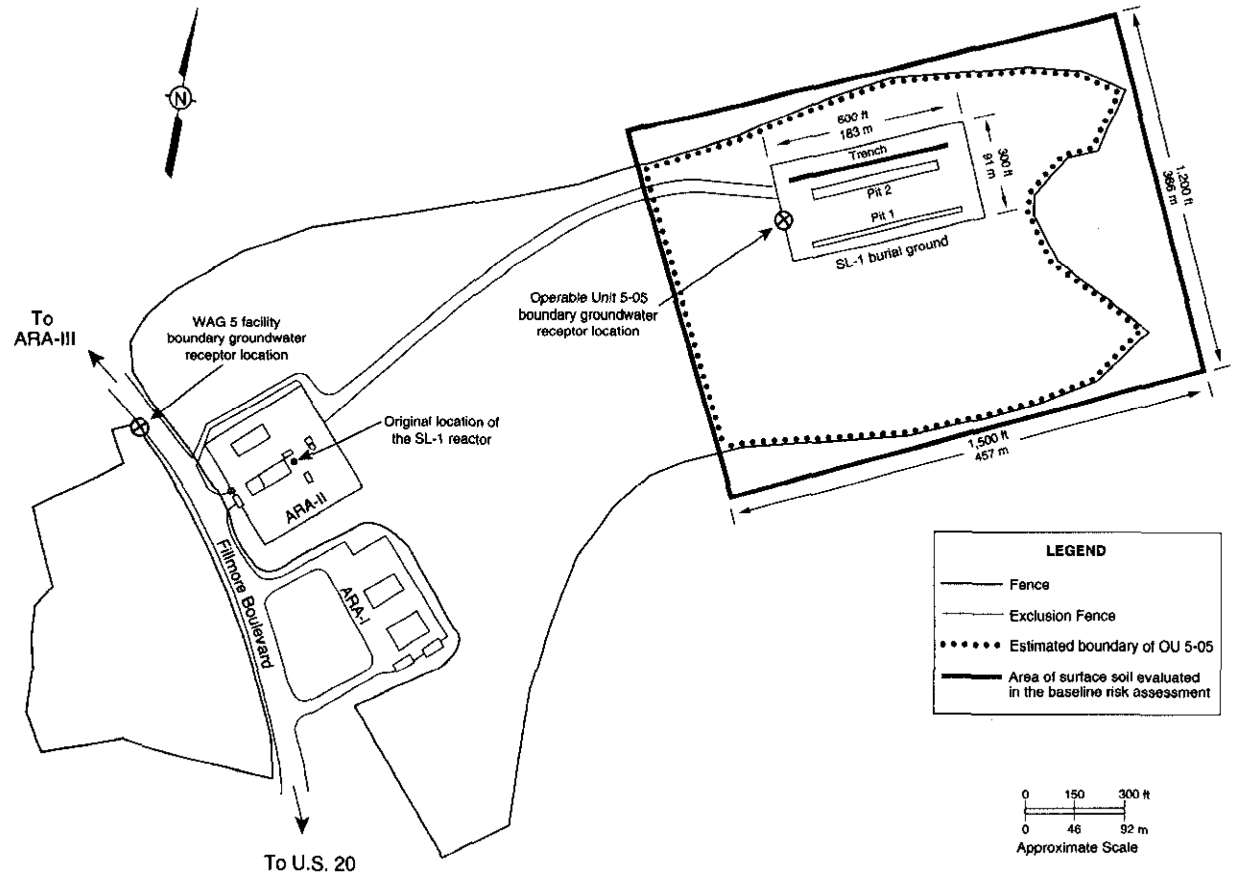

Figure 2. SL-1 site layout.

a potential excess risk greater than 1 in 10,000,000 at BORAX-I are listed in the sidebar. Excess risk values are higher than the range of risks deemed acceptable by the EPA. The greatest excess risk for all scenarios is from cesium-137 and its progeny in the external exposure pathway. Risk estimates for the BORAX-I burial ground were produced using the same assumptions previously described for the SL-1 burial ground.

The site-specific occupational scenario uses the assumption that the only activities at BORAX-I will be radiological monitoring, requiring a maximum of 5 days a year over the next 3 years, resulting in a total excess cancer risk of 3 in 100,000. The residential baseline risk assessment is founded on the assumptions that no remedial actions are performed at the site, the site is released from DOE control for residential use 30 years from 1994, and the resident is directly exposed to the waste 24 hours a day, 350 days per year for 30 years. In such circumstances, people could be exposed to direct radiation fields, which would statistically increase the excess cancer risk. The excess risk associated with this hypothetical chain of events would be 3 in 100 for the residential scenario in the year 2024. The subsistence farmer scenario is used to model an on-site resident raising and consuming crops 100 years in the future, in the year 2094, with a total excess cancer risk of 6 in 1,000.

For BORAX-I, the groundwater model yielded concentrations of uranium-234 and its progeny, with a risk sum of 2 in 1,000,000. Summed with the risks from the remaining radionuclides (listed in the sidebar), the total risk due to groundwater ingestion associated with BORAX-I is 3 in 1,000,000. The identified risks were from a receptor location at the edge of the foundation, as illustrated in Figure 3.

BORAX-I Contaminants of Concern

Actinium-227	(plus progeny)
Cesium-137	(plus progeny)
Krypton-85	
Lead-210	(plus progeny)
Radium-226	(plus progeny)
Strontium-90	(plus progeny)
Uranium-234	(plus progeny)
Uranium-235	(plus progeny)
Uranium-238	(plus progeny)

INEL Information Repositories
INEL Technical Library DOE-ID Public Reading Room 1776 Science Center Drive Idaho Falls, ID 83415 (208) 526-1185
Pocatello Public Library 812 East Clark Pocatello, ID 83201 (208) 232-1263
Shoshone-Bannock Library HRDC Building Bannock and Pima Streets Fort Hall, ID 83202 (208) 238-3882
INEL Boise Office 816 West Bannock, Suite 306 Boise, ID 83702 (208) 334-9572
University of Idaho Library University of Idaho Campus Moscow, ID 83843 (208) 885-6344
Select documents will be included in the following locations:
Boise Public Library 715 South Capitol Blvd. Boise, ID 83702 (208) 384-4076
Twin Falls Public Library 434 2nd Street East Twin Falls, ID 83301 (208) 733-2964
Idaho Falls Public Library 457 Broadway Idaho Falls, ID 83402 (208) 526-1450

INEL Regional Office
INEL Boise Office 816 West Bannock, Suite 306 Boise, ID 83702 (208) 334-9572

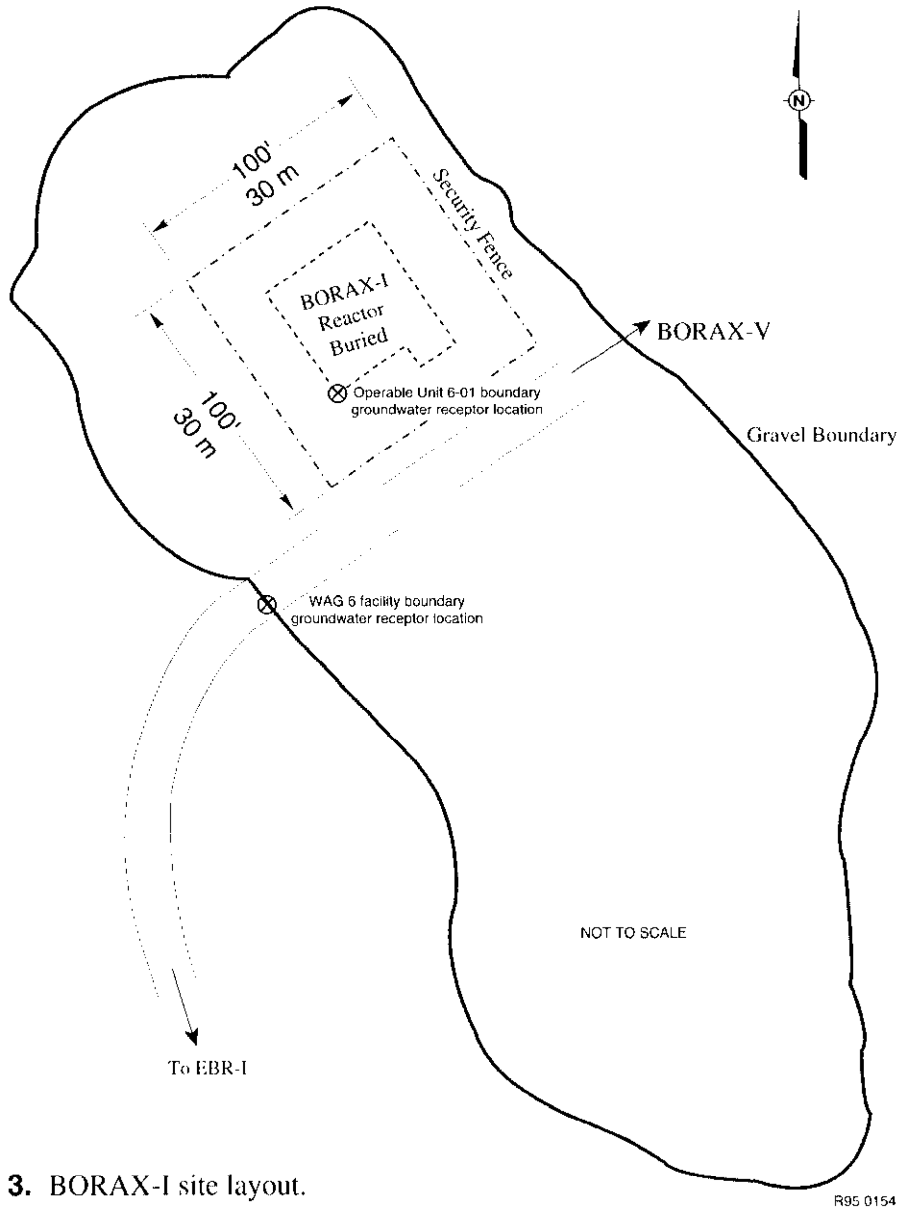

Figure 3. BORAX-I site layout.

Total excess risks for the 10 scenarios assessed in the baseline risk assessment for the BORAX-I burial site range from 3 in 100,000 to 3 in 100. Details can be found in the Section 6 of the investigation report.

Limitations of Assumptions

Estimates of risk typically utilize conservative assumptions with associated uncertainty in conducting the baseline risk assessment. These assumptions ensure that all risk calculations incorporate the highest reasonable maximum exposure that could exist at each site. While potential health problems are the basis for the agencies' recommendation for action, there is considerable uncertainty in the results of the modeling and risk assessment; therefore, conservative assumptions are applied. Some of these uncertainties, particularly those associated with variables used in risk equations and modeling, are quantified with the probabilistic risk assessment. Other uncertainties cannot be quantified. Complete discussions of the assumptions applied and related uncertainties in the risk assessment appear in Section 6 of the investigation report.

Ecological Risk Evaluation

Based on the qualitative ecological risk assessment in Section 7 of the investigation report, neither burial ground is expected to have any disruptive effects on animal or plant populations or the local ecosystem. The contaminants are limited in distribution and most of the contamination is buried and not readily available to plant and animal life. Intrusion into the waste by burrowing animals and deep-rooted plants could result in the transport of contaminants to the surface, but effects, if any, would be limited to very small local populations of permanent residents. The relatively small sizes of the sites minimize the potential for contaminant exposures for migratory birds and large mammal species on the INEL. No species of concern are known to inhabit either site.

Fate and Transport Modeling

To aid in evaluating potential baseline risks, ***fate and transport modeling*** was applied to predict the migration of radionuclides to the groundwater. The ***vadose zone*** model predicts the maximum contaminant concentrations that could reach the Snake River Plain Aquifer given reasonable estimates of environmental conditions.

A computer model that is used to define upper bounds of risk predicts the following excess risks for the groundwater pathway: 1 in 1,000,000 for the SL-1 burial ground and 3 in 1,000,000 for the BORAX-I burial ground. These values are within the EPA risk range of 1 in 10,000 to 1 in 1,000,000, which may be considered acceptable by EPA. The most important considerations, including the infiltration rate, the distance to groundwater, and the physical aspects of the soil and radionuclides, were chosen to maximize the contaminant concentrations generated in the groundwater modeling. Due to this approach, groundwater risks are likely overestimated.

Remedial Action Objectives

As part of the remedial investigation/feasibility study process, ***remedial action objectives*** were developed in accordance with the National Contingency Plan and EPA guidance. The intent of the remedial action objectives is to set goals for protecting human health and the environment. The goals are designed specifically to mitigate the potential adverse effects associated with the burial grounds.

Remedial action objectives for protection of human health are to prevent exposure to, ingestion of, and inhalation of radionuclides that would result in a total excess cancer risk for all contaminants greater than 1 in 10,000 to 1 in 1,000,000. Results of the remedial investigation and baseline risk assessment indicate that exposure to penetrating radiation from contaminated soils and materials within the burial grounds presents the most significant future risk to human health. Therefore, the primary remedial action objectives and the focus of the remedial action alternative development is to inhibit exposure to radioactive materials.

For protection of the environment, remedial action objectives are to prevent adverse effects to resident species from exposure to contaminants at the burial grounds and to prevent degradation of the burial grounds that could result in exposure of buried wastes or migration of contaminants to the surface.

IDAHO DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENTAL QUALITY

The **Idaho Department of Health and Welfare** is one of the three agencies identified in the Federal Facility Agreement which establishes the scope and schedule of remedial investigations at the INEL. Project correspondence by the Division of Environmental Quality staff can be found in the Administrative Record for this project under Operable Unit 5-05 and 6-01.

For additional information concerning the state's role in preparing this proposed plan contact:

Dean Nygard
Idaho Department of Health and Welfare
Division of Environmental Quality
1410 N. Hilton, Boise, ID 83706
(208) 334-5860, (800) 232-4635

fate and transport modeling - computer simulations of the natural environment, performed to estimate the transport of a contaminant through environmental media in order to provide input to the baseline risk assessment to estimate current and future risk.

vadose zone - a region extending from the ground surface to the top of the groundwater table (*i.e., Snake River Plain Aquifer*); it is approximately 610 feet thick beneath the SL-1 burial ground and 580 feet thick below the BORAX-I burial ground.

remedial action objectives - goals set in accordance with EPA guidance for protection of human health and environmental receptors from potential adverse effects of contaminants in any media; usually include targeted cleanup goals.

Summary of Alternatives

The **U.S. Environmental Protection Agency** is one of the three agencies identified in the Federal Facility Agreement which establishes the scope and schedule of remedial investigations at the INEL. Correspondence by the Region 10 staff concerning this project can be found in the Administrative Record under Operable Unit 5-05 and 6-01.

For additional information concerning the EPA's role in preparing this proposed plan contact:

Wayne Pierre
Environmental Protection Agency
Region 10
1200 Sixth Avenue, Seattle, WA 98101
(206) 553-7261

Instead of the conventional approach to developing remedial action alternatives (as described in CERCLA feasibility study guidance), the agencies agreed to employ a focused feasibility study approach. Conventional feasibility studies examine the "universe of technologies" that may be applicable for a given site. In the focused approach, remedial action alternatives selected in previous CERCLA Records of Decision for "similar" sites form the basis for developing alternatives. This approach facilitates the selection of appropriate remedial actions and reduces the high cost and extended schedule typically necessary for the conventional feasibility study. Based on this focused approach, eight alternatives were developed.

The feasibility study provided an initial screening evaluation followed by a detailed analysis of the remedial alternatives. The initial screening evaluation focused on the effectiveness, implementability, and cost of each of the eight individual alternatives developed. A detailed analysis was then conducted on those remedial alternatives that passed the initial screening evaluation. Of the eight alternatives developed in the feasibility study, five were retained for detailed analysis.

Three individual alternatives were considered but screened from further consideration because they either did not satisfy the remedial action objectives or were not implementable. Eliminated alternatives include (1) limited action, including institutional controls and surface maintenance; (2) containment with a concrete cap; and (3) excavation and removal using remote-controlled equipment. Additional discussion of these alternatives and screening from detailed evaluation can be found in Section 11 of the investigation report.

The remaining five individual alternatives considered in the feasibility study were subjected to detailed analysis. Although the No Action alternative is not considered effective for protection of human health and the environment, this alternative was used in the detailed analysis as a baseline against which the other alternatives were compared. Three of the alternatives submitted to detailed analysis involved containment by capping with an engineered barrier. Due to the similarity between these three containment alternatives, a single generic alternative is used to represent this category of remedial action (containment) in the Proposed Plan. Therefore, the three types of alternatives submitted to detailed analysis include:

Alternative 1: No action
Alternative 2: Containment by capping with an engineered long-term barrier comprised primarily of natural materials
Alternative 3: Removal by conventional excavation with disposal at the Radioactive Waste Management Complex.

Applicable or Relevant and Appropriate Requirements (ARARs) - "Applicable" requirements mean those standards, criteria, or limitations promulgated under federal or state law that are required specific to a substance, pollutant, contaminant, action, location, or other circumstance at a CERCLA site. "Relevant and Appropriate" requirements mean those standards, requirements, or limitations that address problems or situations sufficiently similar to those encountered at the CERCLA site such that their use is well suited to that particular site.

Alternatives 2 and 3 involve remedial actions and must meet all ***Applicable or Relevant and Appropriate Requirements*** (ARARs). The primary ARARs that may apply to either of these alternatives include:

- National Emission Standards for Radionuclide Emissions Other than Radon from DOE Facilities (40 CFR §61.90)
- Idaho Rules for Control of Fugitive Dust (IDAPA 16.01.01.650 and .651)
- Idaho Rules for Toxic Air Pollutants (IDAPA 16.01.01.585 and .586).

These regulations focus on protection of the public from radiation and control of emissions that may result from any remediation activities. As ARARs, these regulations govern potential radionuclide emissions and dust-generating activities (e.g., excavation, earth-moving, heavy-equipment operation, etc.). Although DOE orders are not ARARs, established DOE orders would be followed to ensure radiation protection for the environment and the public, and are identified as "to be considered." Currently, no EPA or state of Idaho regulations exist that establish cleanup levels for radionuclide contaminants in soil.

Excess risks at each site will decrease with time due to radioactive decay. For SL-1, risks due to external exposure to cesium-137 and progeny will decrease to about 1 in 10,000 in approximately 400 years. External exposure risks will continue to decrease over the next 300 years and level off at about 3 in 1,000,000, where it will remain essentially forever due to the presence of long-lived uranium-235. For BORAX-I, risks from external exposure to cesium-137 will decrease to approximately 2 in 10,000 in about 320 years. External exposure risks will then remain nearly constant at 2 in 10,000 due to the presence of uranium-235. Therefore, to inhibit exposure to cesium-137, remedial action must be effective for about 400 years at SL-1 and 320 years at BORAX-I.

Written comments can be submitted to the ***U.S. Department of Energy Idaho Operations Office,*** *and addressed to:*

Mr. Jerry Lyle
Acting Deputy Assistant Manager
Office of Program Execution
P.O. Box 2047
Idaho Falls, ID 83403-2047

For additional information regarding the Environmental Restoration Program at the INEL, call Reuel Smith at (208) 526-6864, or call (800) 708-2680.

Residual excess risks from contaminants left on site will be a component of risk management decisions, made by the agencies, to ensure that residual risks are adequately addressed. Risk management issues include the design life of the cap and the extent of surface soil consolidation.

The No Action alternative and the two alternatives that passed the screening criteria are described below. Remedial action at either site may include consolidation of surface soils, depending on radiological survey data acquired during remedial design. During the remedial design process surveys of the potentially contaminated surface soils at each site will be conducted. Surface soils found to present a potential human health excess risk of over 1 in 10,000 will be consolidated under the proposed cap for each site. Therefore, costs are presented in ranges, with the lower estimate representing no soil consolidation and the higher estimate representing maximum consolidation. Surface areas as large as 1,800,000 square feet at SL-1 and 84,000 square feet at BORAX-I may require consolidation at respective costs of about $1.4 million and $0.9 million.

Alternative 1: No Action

Under Alternative 1, no attempt would be made to contain, treat in place, or remove contaminated materials. Instead, long-term environmental monitoring would be performed to assess contaminant migration from the burial grounds. Environmental monitoring would consist of those methods used to identify contaminant migration within environmental media (air, groundwater, and soil) and to identify the exposure resulting from those contaminated media. Monitoring results would be used to determine the need for any future remedial actions necessary to protect human health and the environment. There were no ARARs identified for the No Action alternative. The cost for implementing environmental monitoring under this alternative for the next 30 years is estimated to be $1.06 million at SL-1 and $1.37 million at BORAX-I.

Alternative 1

No action:

- No attempt would be made to contain, treat, or remove contaminated materials
- Environmental monitoring would be performed
- Costs are estimated at $1.06 million for SL-1 and $1.37 million for BORAX-I

Alternative 2: Containment by capping with an engineered long-term barrier comprised primarily of natural materials

Alternative 2 is a containment action that consists of installing a long-term engineered barrier (cap) over a burial site to provide shielding from penetrating radiation, inhibit contaminant migration, and limit intrusion. Barrier technology is currently in use at several waste sites to provide long-term isolation of radioactive wastes that are disposed in place, as is the case for both burial grounds. The cap can be designed to

Alternative 2

Containment by capping with an engineered long-term barrier comprised primarily of natural materials:

- A cover would be installed over the burial sites
- Wastes would remain in place
- Periodic monitoring for effectiveness and maintenance needs would be performed
- Costs are estimated between $3.7 and $8.8 million for SL-1 and between $2.3 and $4.7 million for BORAX-I

last up to 1,000 years and would be several feet thick to provide a shield from penetrating radiation, inhibit biotic intrusion by deep-rooting plants and burrowing animals and insects, and discourage human intrusion. Contaminant migration would be inhibited by reducing erosion by wind and water.

The barrier would be designed to optimize characteristics desirable for conditions at the INEL and minimize maintenance requirements. A multiple-layer cover system comprised primarily of natural materials will be designed during the remedial design phase of the remedial action. Layers will consist of a combination of sand, gravel, silt, basalt, cobbles, or soil.

The ARAR identified for this alternative is the Idaho Rules for Control of Fugitive Dust (IDAPA 16.01.01.650 and .651). This ARAR would be met during the construction of a barrier at either site by application of appropriate engineering controls to minimize generation of airborne contamination and dust.

The estimated costs of Alternative 2 range from $3.7 to $8.8 million for SL-1 and from $2.3 to $4.7 million for BORAX-I, depending on the disposition of contaminated surface soil and the cap design. Periodic monitoring of the cap would be necessary to demonstrate the effectiveness of the remedy and determine if maintenance is required.

Alternative 3

Removal by conventional excavation with disposal at the Radioactive Waste Management Complex:

- All contaminated materials would be removed from the burial grounds using conventional excavation techniques and disposed at the Radioactive Waste Management Complex
- Excavated area would be backfilled with clean fill material and revegetated
- Costs are estimated between $68.9 and $201.6 million for SL-1 and between $8.4 and $20.5 million for BORAX-I

Alternative 3: Removal by Conventional Excavation with Disposal at the Radioactive Waste Management Complex

Alternative 3 is the complete removal of all contaminated materials from the burial grounds using conventional excavation techniques. Once removed, contaminated materials would be packaged and transported to the Radioactive Waste Management Complex for disposal. Conventional excavation techniques utilize commercially available earth-moving equipment. Should this alternative be implemented at either site, cleanup levels would be established on the basis of excess risk at the INEL.

Following the removal of contaminated soil and solid waste, the excavated area would be backfilled with clean fill material and compacted to prevent future subsidence or settling. A layer of topsoil would be placed over the compacted backfill, contoured to match the surrounding landscape, and seeded with an appropriate mixture of native grasses and shrubs to facilitate revegetation.

The ARARs identified for this alternative include the National Emissions Standards for Radionuclide Emissions Other than Radon from DOE Facilities (40 CFR §61.90), Idaho Rules for Toxic Air Pollutants (IDAPA 16.01.01.585 and .586), and Idaho Rules for Control of Fugitive Dust (IDAPA 16.01.01.650 and .651). All three ARARs would be met during the retrieval of contaminated materials from either site by conducting excavation activities within an enclosed structure fitted with a filtered ventilation system and by providing dust suppression measures.

The estimated costs of Alternative 3 are between $68.9 and $201.6 million at SL-1 and between $8.4 and $20.5 million at BORAX-I, depending on the disposition of contaminated surface soils. These estimates are based on the assumption that no additional costs are incurred once the contaminated materials are removed from the sites. No environmental monitoring would be required after contaminated materials were removed and confirmation samples were collected and analyzed to verify completion of site cleanup.

Evaluation of Alternatives

Each of the three types of alternatives subjected to detailed analysis were evaluated against eight of the nine ***evaluation criteria*** identified under CERCLA. Brief definitions and the categorization of all nine criteria are provided in the side bar on page 16. The ninth criterion, community acceptance, will be evaluated when public responses to the proposed remedial actions for the burial grounds are received. Evaluations against the first eight evaluation criteria are summarized in the following sections. Each alternative must meet the ***threshold criteria*** to be considered for selection as a preferred remedial action alternative. Evaluations against the primary balancing criteria, which are used to weigh major trade-offs among alternatives, are summarized in Table 2.

evaluation criteria - criteria established by CERCLA to develop a preferred remedial alternative.

threshold criteria - two of the evaluation criteria that must be met by an alternative to be further considered for implementation.

Overall Protection of Human Health and the Environment

Results of the baseline risk assessment indicate that exposure risks will decrease to below 1 in 10,000 after approximately 400 years at SL-1. Exposure risks at BORAX-I will decrease to approximately 2 in 10,000 after 320 years, then remain essentially unchanged far into the future. Alternative 1: No Action would not satisfy the criterion of overall protection of human health and the environment. Alternative 3: Removal by Conventional Excavation with Disposal at the Radioactive Waste Management Complex would provide effective long-term protection of human health and the environment, but would result in potentially significant exposures for workers removing the radionuclide-contaminated wastes during the remedial action.

The containment alternative, Alternative 2, would provide overall protection of human health and the environment. A protective cover would provide shielding from penetrating radiation, limit contaminant migration, and inhibit intrusion into the wastes by humans, plants, and animals. Long-term protection would be ensured by incorporating design features engineered to last up to 1,000 years.

Both of the action alternatives would result in a reduction of excess lifetime cancer risk. Alternative 2 would result in an excess lifetime cancer risk of less than 1 in 1,000,000 for the life of the cap by shielding, limiting migration of contamination, and inhibiting intrusion into the waste. Alternative 3, the removal action, would reduce risk by managing contaminated materials removed from the burial grounds within an operating radioactive waste disposal facility.

Table 2. Evaluation of alternatives.

Balancing Criteria	Alternative 2: Containment	Alternative 3: Removal
Long-Term Effectiveness	◒	●
Reduction of Toxicity, Mobility, or Volume Through Treatment	◒*	◒*
Short-Term Effectiveness	◒	○
Implementability	◒	∅
Cost	◒	○

● = Best ◒ = Good ∅ = Poor ○ = Worst

* Although no treatment alternatives were evaluated, reduction of mobility is achieved through containment or waste management and disposal.

Evaluation Criteria
Threshold Criteria:
1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced, or controlled through treatment, engineering controls, or institutional controls.
2. **Compliance with Applicable or Relevant and Appropriate Requirements** (ARARs) addresses whether a remedy will meet all of the ARARs under federal and state environmental laws and/or justifies a waiver.
Balancing Criteria:
3. **Long-term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.
4. **Reduction of Toxicity, Mobility, or Volume through Treatment** addresses the degree to which a remedy employs recycling or treatment that reduces the toxicity, mobility, or volume of the contaminants of concern, including how treatment is used to address the principal threats posed by the site.
5. **Short-term Effectiveness** addresses any adverse impacts on human health and the environment that may be posed during the construction and implementation period and the period of time needed to achieve cleanup goals.
6. **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
7. **Cost** includes estimated capital and operation and maintenance costs, expressed as net present-worth costs.
Modifying Criteria:
8. **State Acceptance** reflects aspects of the preferred alternative and other alternatives that the state favors or objects to, and any specific comments regarding state ARARs or the proposed use of waivers.
9. **Community Acceptance** summarizes the public's general response to the alternatives described in the Proposed Plan and in the remedial investigation/feasibility study, based on public comments received.

Compliance with ARARs

There are no ARARs identified for the No Action alternative. The other two alternatives meet the identified ARARs through engineering controls and operating procedures. The primary ARARs considered in this study are discussed in the Summary of Alternatives section. These ARARs focus on controlling exposures to the public and air emissions that may result from any remediation activities at the SL-1 and BORAX-I operable units.

Long-term Effectiveness and Permanence

The Alternative 3 removal action provides the highest degree of long-term effectiveness and permanence because contaminated materials would be completely removed. However, removing and transferring contaminated materials from one place to another within the INEL (i.e., from SL-1 or BORAX-I to the Radioactive Waste Management Complex) is potentially hazardous. Alternative 1, No Action, provides the least possible level of long-term effectiveness and permanence because unacceptable risks would remain at both burial grounds.

The long-term effectiveness and permanence of containment, Alternative 2, is dependent on the design-life of each protective cover. As described previously, the cover can be designed to last up to 1,000 years. Risks at SL-1 will fall below the 1 in 10,000 risk range in about 400 years. Risks at BORAX-I will decrease to about 2 in 10,000 in approximately 320 years and remain constant, essentially forever, due to the presence of long-lived uranium-235.

Reduction of Toxicity, Mobility, or Volume through Treatment

None of the remedial alternatives developed for the burial grounds involve the use of treatment to reduce the toxicity, mobility, or volume of contaminated materials. However, the containment offered by Alternative 2 would result in reduced contaminant mobility. A protective cover would prevent erosion and biointrusion from exposing contamination at the surface. The mobility of contamination at either site would be reduced for as long as the protective cover remained functional. The excavation action of Alternative 3 would also reduce contaminant mobility through waste management and disposal practices at the Radioactive Waste Management Complex. Alternative 1, No Action, would have no impact on the toxicity, mobility, or volume of contaminated materials.

Short-term Effectiveness

In general, the alternative that requires the least amount of disturbance of contaminated materials ranks the highest in terms of short-term effectiveness. As such, Alternative 1 (no action) provides the highest degree of short-term effectiveness because no additional on-site activities are required. Alternative 3 (conventional excavation) offers the least short-term effectiveness due to direct contact with contaminated materials that would result during excavation of the burial grounds and transport to the Radioactive Waste Management Complex. Assuming no protective measures were in place, workers installing the Alternative 2 cap would receive external exposure to penetrating radiation until sufficient construction material (e.g. soil, sand, gravel, etc.) was placed over the burial ground to provide adequate shielding. Based on modeling and field measurements, approximately 1 foot of additional soil placed over either burial ground would reduce external exposures to background radiation levels. Consequently, the soil required to form the foundation for a protective cover may be all that is required to reduce external exposures to acceptable levels for workers

Table 3. Summary of estimated costs for SL-1 remediation alternatives.[a]

Cost Elements	Alternative 1 No Action	Alternative 2 Containment[b]	Alternative 3 Excavation[b]
Construction			
Mob/Demob cap subcontractor	N/A	$25,000	N/A
Groundwater monitoring	$100,000	$100,000	N/A
Construction of cap	N/A	$835,000 - $1,957,000	N/A
Surface soil consolidation	N/A	$0.00 - $1,365,000	$0.00 - $297,000
Surface water control	N/A	$60,000 - $150,000	N/A
Air monitoring	N/A	$100,000	$100,000
Excavation	N/A	N/A	$5,810,000
Waste handling	N/A	N/A	$500,000
QA/QC lab costs	N/A	N/A	$200,000
RWMC disposal	N/A	N/A	$27,155,000 - $91,955,000
Backfill and revegetate	N/A	N/A	$64,000 - $343,000
Miscellaneous	N/A	$150,000	$200,000
Construction management	N/A	$265,000 - $768,000	$7,104,000 - $20,833,000
Eng. design and inspection	N/A	$214,000 - $622,000	$5,751,000 - $16,865,000
Contractor overhead and profit	N/A	$441,000 - $1,280,000	$11,840,000 - $34,722,000
Contingency	N/A	$378,000 - $1,097,000	$10,149,000 - $29,762,000
Construction Subtotal[c]	**$ 100,000**	**$2,568,000 - $7,614,000**	**$68,873,000 - $201,587,000**
Post-closure costs			
Cap monitoring and maintenance	N/A	$122,000 - $158,000	N/A
Environmental monitoring	$771,000	$771,000	N/A
Contingency	$193,000	$223,000 - $232,000	
Post-closure costs subtotal[d]	**$964,000**	**$1,116,000 - $1,161,000**	**N/A**
Total[e]	**$1,060,000**	**$3,684,000 - $8,775,000**	**$68,870,000 - $201,590,000**

a. Costs are for 1994.
b. Cost ranges reflect variations in cap design and the effects of consolidating none or all of the contaminated surface soils.
c. Includes operating costs (net present value) during remedial action.
d. Net present value assuming 5% interest (net of inflation) for 30 years.
e. Rounded to ten thousands.
N/A = not applicable, item is not included in the scope for the alternative.

constructing the cover. Short-term effectiveness for Alternatives 2 and 3 would be equally diminished if surface soil consolidation is required.

Implementability

Each of the three alternatives retained for detailed analysis is technically implementable. No Action, Alternative 1, could be easily implemented because only long-term environmental monitoring is required. Alternative 3, excavation and removal, would be the most difficult to implement because of the complexity of the remediation process. This alternative would require significant time and resources to perform environmental assessments, safety analyses, designs, and demonstrations prior to initiating any removal activity.

The containment option of Alternative 2, in general, is implementable from a technical perspective. However, due to the variability and complexity of protective cover designs, careful engineering, and planning would be required to construct a cap meeting design requirements. These design requirements will be specified during the remedial design phase. However, the overall performance of the cap would be established in the Record of Decision. Construction capabilities for covers are

Table 4. Summary of estimated costs for BORAX-I remediation alternatives.[a]

Cost Elements	Alternative 1 No Action	Alternative 2 Containment[b]	Alternative 3 Excavation[b]
Construction			
Mob/Demob cap subcontractor	N/A	$25,000	N/A
Groundwater monitoring	$200,000	$200,000	N/A
Construction of cap	N/A	$164,000 - $423,000	N/A
Consolidation of surface soil	N/A	$0.00 - $881,000	$0.00 - $30,000
Surface water control	N/A	$60,000	N/A
Air monitoring	N/A	$100,000	$50,000
Excavation	N/A	N/A	$1,760,000
Waste handling	N/A	N/A	$250,000
QA/QC lab costs	N/A	N/A	$100,000
RWMC disposal	N/A	N/A	$1,934,000 - $ 7,854,000
Backfill and revegetate	N/A	N/A	$5,000 - $24,000
Miscellaneous	N/A	$125,000	$100,000
Construction management	$42,000	$142,000 - $381,000	$861,000 - $2,114,000
Eng. design and inspection	$34,000	$115,000 - $308,000	$697,000 - $1,712,000
Contractor overhead and profit	$70,000	$236,000 - $635,000	$1,435,000 - $3,524,000
Contingency	$60,000	$202,000 - $544,000	$1,230,000 - $3,020,000
Construction Subtotal[c]	**$406,000**	**$1,369,000 - $3,682,000**	**$8,422,000 - $20,538,000**
Post-closure costs			
Cap monitoring and maintenance	N/A	$9,000 - $31,000	N/A
Environmental monitoring	$771,000	$771,000	N/A
Contingency	$193,000	$195,000 - $201,000	N/A
Post-closure costs subtotal[d]	**$964,000**	**$975,000 - $1,003,000**	**N/A**
Total[e]	**$1,370,000**	**$2,340,000 - $4,690,000**	**$8,420,000 - $20,540,000**

a. Costs are for 1994.
b. Cost ranges reflect variations in cap design and the effects of consolidating none or all of the contaminated surface soils.
c. Includes operating costs (net present value) during remedial action.
e. Net present value assuming 5% interest (net of inflation) for 30 years.
f. Rounded to ten thousands.
N/A = not applicable, item is not included in the scope for the alternative.

commercially available, and covers have been used at many similar sites in both private industry and at government facilities. Specialized construction equipment and materials would not be required.

direct cost - the estimated dollars for equipment, construction, and operation activities to conduct a remedial action.

indirect cost - the estimated dollars for activities that support the remedial action (e.g., construction management, project management, management reserve, etc.).

Cost

Table 3 for SL-1 and Table 4 for BORAX-I summarize the estimated costs for each remedial action alternative. These estimates, in present dollar value, include ***direct costs*** and ***indirect costs*** associated with construction and operation and maintenance. The estimates also include post-closure costs for long-term monitoring and maintenance. These are administrative costs associated with maintenance of fences, signs, erosion control, environmental monitoring, and other issues not related to the actual construction of a cap. It is assumed that one additional groundwater monitoring well will be constructed for SL-1 and that two wells will be constructed at BORAX-I, at a cost of $100,000 per well.

Contingency costs, representing unforeseen but necessary costs, have been included for each of the three primary cost elements (i.e., construction, operations and maintenance, and post-closure monitoring). Generally, contingency is reduced as details of the design for a particular remedial action are refined. Note, however, that these costs were developed for comparative purposes to support the selection of a preferred alternative, not to determine actual costs. Actual costs cannot be forecast until the remedial design for the selected alternative is determined.

The wide range in total costs for Alternative 2, as presented in Tables 3 and 4, is based upon comparison of no soil consolidation versus maximum soil consolidation, and variations in cap design. If soil consolidation is included in the remedial actions at SL-1 and BORAX-I, there are increased costs as a result of excavation and consolidation, and other associated cost increases for additional capping materials. The wide range in total costs for Alternative 3 is based upon comparison of allowing the contaminated surface soils to remain in place versus excavation, disposal, backfilling, and revegetation of the area. Disposal and other associated capital costs account for the greatest increase in the total costs if consolidation is included. As much as 1,800,000 square feet of surface area to a depth of 6 inches (900,000 cubic feet) at SL-1 and as much as 84,000 square feet to a depth of 1 foot (84,000 cubic feet) at BORAX-I may require consolidation.

State Acceptance

The Idaho Department of Health and Welfare has been involved in preparing this Proposed Plan and concurs with its issuance.

Summary of Preferred Alternative

The preferred remedial action for both burial grounds is Alternative 2: Containment by capping with an engineered long-term barrier comprised primarily of natural materials. The agencies believe that this alternative represents the best balance of trade-offs with respect to the evaluation criteria. Alternative 2 provides overall protection of human health and the environment, complies with ARARs, provides long- and short-term effectiveness, is readily implementable, and is cost-effective. Engineered barriers can effectively isolate contaminated materials from the accessible environment. Isolation both inhibits migration of contaminants from the burial grounds and allows time for radioactive decay of the primary contributor to the overall risk (i.e., cesium-137 and progeny). The agencies believe that an engineered cover system can maintain isolation of contaminated materials while the overall risks decrease.

Results of the baseline risk assessment indicate that the direct exposure pathway dominates the overall risk calculated for both burial grounds. The primary contributor to this risk at both sites is cesium-137 and its progeny. Based on the time required for radionuclide decay to reduce the direct exposure risk to 1 in 10,000 at SL-1 and 2 in 10,000 at BORAX-I, a protective cover would be required to remain in place for approximately 400 years at SL-1 and 320 years at BORAX-I.

The Alternative 2 cover would be designed to maintain effective long-term isolation of contaminants. Engineered barriers have been used extensively for remedial actions involving radionuclide-contaminated wastes. Design is flexible and can be easily modified to accommodate various site-specific conditions and longevity requirements. The number and thicknesses of layers designed in the cover depend on site-specific considerations, such as local climatic and geographic conditions, including precipitation rate, freeze depth, indigenous plant and animal species, and local topography. Additional design considerations would include the engineered lifetime of each cap, a minimum of 400 years at SL-1 and a minimum of 320 years at BORAX-I, to allow decay of Cs-137 and reduce exposure risks. The specific cover design for each burial ground would be defined during final remedial design.

The cover design would provide:

- Shielding from penetrating radiation
- A barrier to human and biotic intrusion
- Longevity through the predominant use of naturally occurring materials
- Resistance to erosion that could expose buried waste and contribute to contaminant migration
- Containment of contaminated surface soils
- Low maintenance requirements.

The preferred alternative for the burial grounds satisfies the remedial action objectives for protection of human health and the environment for the lifetime of the cap. Capping the burial grounds would inhibit potential exposure for human and environmental receptors and minimize the spread of contamination.

In addition to the cover system, Alternative 2 would include access controls, surface-water diversion, and long-term monitoring. Access controls, such as fencing, warning signs, and land-use restrictions, would be used to deter would-be trespassers. Surface-water diversion measures, such as contour-grading or drainage ditches, would be used to direct surface water away from the burial grounds and into nearby, naturally occurring drainage formations. Long-term environmental monitoring of air, soil, and groundwater would be used to confirm isolation of the buried contaminants from the accessible environment and groundwater. Long-term cap integrity monitoring would be used to assess erosion, cracking, or other observable deterioration. Specification of the most appropriate access controls, surface-water diversion measures, and long-term monitoring requirements would be established during the remedial design phase. By the end of the 30-year period, cesium-137, the major risk driver, will have decayed an additional half-life.

Because this remedy will result in wastes remaining onsite, 5-year reviews of the Record of Decision and reviews of the monitoring data will be conducted by EPA and IDHW. Evaluation will be performed within 5 years of the Record of Decision signature, and conducted at least every 5 years thereafter to ensure the remedy continues to provide adequate protection of human health and the environment.

No Action Sites

The following sections of this Proposed Plan summarize information and seek comment on the group of sites proposed by the agencies as requiring no further action at ARA-I, ARA-III and Power Burst Facility (PBF) in operable units 5-01, 5-02, 5-03, 5-04, and 5-11. These sites had been identified from earlier documents as potential sources of contamination.

The typical superfund site is often an obvious disposal site that contains hazardous wastes that have leaked into underlying soils and groundwater. In these cases, the location and boundaries of areas of contaminant concentrations can be readily identified. Many sites at the INEL do not fit into this typical category. Instead, they fall into the category of ***historical sites*** and have low or unknown quantities of residual contamination. These sites are termed ***low probability hazardous sites***. For typical low probability hazardous sites, either the locations and quantities of hazardous substances disposed or leaked are unknown or there is significant uncertainty in the actual conditions. Detailed information on these decision documents can be found in the "Auxiliary Reactor Area" and "Power Burst Facility Waste Area Group 5, Track 1 Sites" Administrative Record binder, located in the INEL Information Repositories.

historical sites - sites determined to have existed prior to the 1980 enactment of CERCLA that were identified from previous information, personnel interviews, or site records.

low probability hazardous site - typically, these sites were poorly defined with respect to types, quantities, or the presence of contamination prior to the investigation. In some cases, there was even uncertainty about the existence and/or the location of the site.

acceptable risk - the excess risk to an individual for adverse human health effects from a 30-year exposure to a given concentration of a contaminant falls between 1 in 10,000 and 1 in 1,000,000.

In accordance with the Federal Facility Agreement and Consent Order, the agencies are evaluating the potential for contamination at the low probability hazardous sites. The evaluation process involves collecting and interpreting existing data to determine whether the site poses ***acceptable or unacceptable risks***. The information is then assembled into a decision document that consists of a series of questions, forms, tables, and a qualitative risk assessment. This screening approach provides for the efficient use of available resources and for a rigorous process to evaluate the risks from these sites to determine whether additional investigation is required. This evaluation process is then used to determine whether (a) the site poses a clear risk that requires an interim action, (b) the site should be further investigated under CERCLA, (c) the site should be referred to another state or federal program, or (d) the source does not pose a risk to human health or the environment and therefore no further action is required.

unacceptable risk - excess risk exceeds the acceptable risk range and may cause adverse effects to human health and/or the environment.

Over 20 sites at ARA and PBF fall into the category of low probability hazardous sites. Of these, the 10 sites discussed in the following sections have been evaluated and are proposed for no further action under CERCLA. The sites have been arranged into three groups: wastewater disposal sites, soil contamination sites, and underground storage tanks. The evaluation of these sites included record reviews, document searches, employee interviews, site visits, field screening using portable field instruments, and soil sampling where appropriate. The evaluations indicate that these areas do not pose an unacceptable risk to human health or the environment. A brief description and summary of each site is presented below. Complete decision documents for each site are available in the Administrative Record.

ARA - Site Description

ARA buildings and structures were constructed in 1957 for the U.S. Army as a working area to develop a compact power reactor capable of relocation with a minimal amount of time between shutdown and startup. In 1965, the Army Reactor Program was phased out. Since then, all reactors at ARA have been removed or dismantled. From 1966 to 1985, work at ARA included a variety of technical support services for INEL research and development programs that used the metallurgy laboratory, the instrument development laboratory, and the hot cell facility. The ARA facilities have been inactive since 1985 and are currently being dismantled. The area has four parts: ARA-I, ARA-II, ARA-III, and ARA-IV. ARA-I and ARA-III are the only ARA facilities containing sites for this discussion.

ARA-I was constructed in the late 1950s. Its primary function during the Army Reactor Program was to act as a support facility for the other ARA facilities. After the Army Reactor Program was phased out, this area was expanded as a support facility for the other INEL programs, including a metallurgical laboratory and a darkroom.

ARA-III originally housed the Army Gas Cooled Reactor Experiment, a water moderated, nitrogen-cooled reactor that generated heat but no electricity. It was placed in standby April 6, 1961. Two new buildings were built in 1969 to provide laboratory and office space. ARA-III then supported the INEL in all phases of instrumentation, sensor fabrication, and experimental instrumentation for nuclear reactor experiments.

PBF - Site Description

The PBF reactor was built in 1970 to support studies of fuel behavior during normal and off-normal operating conditions, and hypothesized accident conditions. The PBF reactor area is located approximately one-half mile from the PBF Control Area. The PBF reactor is currently on standby awaiting future use in the Boron Neutron Capture Therapy program. The Special Power Excursion Reactor Test (SPERT) area and its associated buildings are located south of the present PBF reactor area. As part of an early reactor safety program, four SPERT facilities were built for the purpose of conducting safety studies on light-water-moderated reactor systems.

SPERT-I operated between 1955 and 1964. During 1964, SPERT-I was deactivated to allow for construction of PBF. Five years later all equipment and instrumentation had been removed and SPERT-I was used to house PBF plant protective system equipment.

SPERT-II housed a relatively low-pressure, heavy-water reactor that first went critical in 1959, performed short tests for 5 years, and was retired in 1964. The reactor was remotely controlled from the control center one-half mile away.

SPERT-III was built in the late 1950s to conduct studies of high-power and high temperature in light-water reactors. The SPERT-III reactor went critical in 1958 and was placed in standby in 1968. In 1968-1969, the SPERT-III facility was used for testing components from Loss of Fluid Test Facility. When the reactor building was decommissioned and decontaminated in 1980, all reactor components were removed. The building now contains the Waste Experiment Reduction Facility.

SPERT-IV was constructed in 1960 to broaden the safety program in the area of reactor stability by providing a prototype for safety tests of swimming pool-type reactors. SPERT-IV operated during the 1960s and was placed on standby in 1970. Decontamination and decommissioning was implemented in 1978 and completed in 1979.

Wastewater Disposal Sites

The following six low probability hazardous sites are classified as wastewater disposal sites because they have been associated with liquid waste discharges from area facilities. During the initial site identification, many of these sites were only suspected of having received hazardous or radioactive waste; subsequent evaluation determined that no disposal activities had occurred. Other sites are known to have had some contamination present, and subsequent evaluation determined that any potential contaminants discharged to the sites have been neutralized, biodegraded, or do not pose an unacceptable risk to human health or the environment.

ARA-05, OU 5-01 [Evaporation Pond to the Northeast (ARA-744)]

ARA-05 is a shallow natural depression in the ground adjacent to ARA-I, which is thought to have received some runoff from an adjacent parking lot. There are no records of waste generation or disposal processes associated with this site, nor are there any records indicating that the site was ever the intended destination of any waste stream. Monitoring surveys have detected the presence of random radioactive particles in both the pond area and the general vicinity around ARA-I and -II. These hot particles are a likely result of the SL-1 accident and cleanup efforts.

This site was prepared in 1993 for removal of radioactive particles, but the survey indicated that the area was free of radioactivity above the ambient background. A risk evaluation indicates that this site does not pose an unacceptable risk to human health or the environment.

ARA-17, OU 5-01 [Boiler Blowdown Drain (ARA-626)]

ARA-17 is a nearly flat drainage area south of ARA-I. Surface dimensions are approximately 150 x 150 feet. A 4-inch drain line runs to the site from the boiler room in the hot cell building. A second line from the raw water storage tank and pump house at the southwest corner of ARA-I also terminates at the site.

There are no known concentrations of radiological contamination above background levels at this site, as confirmed by radiological surveys, and no evidence of nonradiological constituents. Historical documents and process information pertinent to ARA-I do not indicate that this site was the intended destination of any waste stream except uncontaminated water.

PBF-28, OU 5-03 (PBF Cooling Tower Area and Drainage Ditch)

PBF-28 consists of an overspray area of surface soils north of the PBF reactor cooling tower (PBF-720) and the drainage ditch south and west of the cooling tower. The PBF reactor cooling tower began service in 1976 and received reactor secondary cooling water until the reactor became inactive in 1985. The drainage ditch was constructed in the early 1970s and is approximately 600 feet in length. This drainage ditch was used for surface runoff drainage from the reactor area and also received water from the PBF boiler blowdown tank, and discharge or overflow of secondary cooling water from the cooling towers.

Soil samples were collected along the entire 600-foot length of the drainage ditch and the cooling tower area and analyzed for chromium, the primary contaminant of concern. A 100 x 100-foot area was determined to be contaminated from aerosol overspray from the cooling tower. The concentrations of chromium found at this site are substantially below risk-based contaminant levels and pose no risk to human health. There was no radiological activity above background levels for the cooling tower area or the drainage ditch.

PBF-06, OU 5-03 (PBF Reactor Area Blowdown Pit for Reactor Boiler by PBF-621)

PBF-06 is a ditch located near PBF-621 and west of the PBF reactor building. A pipe running from the oil-fired boiler has emptied approximately 30 gallons per day of blowdown water into the pit since 1970. Although the reactor was placed in a standby status in 1985, the boiler is still being used to support the ongoing activities at the facility. This requires continued release of the boiler blowdown water.

The blowdown water contains some chemicals that are used to inhibit corrosion in the boiler. However, the corrosion inhibitors used contain no hazardous chemicals, are nontoxic, and are used in very small quantities. A radiological survey conducted in 1991 found no radiological contamination above background levels at this site. Since the data are reliable and no hazardous constituents have been or are being released into the pit, there is no risk associated with this site.

PBF-24, OU 5-03 [Boiler Blowdown Pit (adjacent PBF-716)]

The PBF-24 boiler blowdown pit was used for drainage of the reactor building PBF-613 boiler waters from 1960 to 1971. The 2 x 2 x 6-foot pit located 30 feet north of the reactor building is a subsurface reinforced concrete structure and has an open gravel base for drainage. A pipe running from the oil-fired boiler emptied approximately 30 gallons per day of blowdown water into the pit.

The blowdown water contained some chemicals that were used to inhibit corrosion in the boiler. However, the corrosion inhibitors used contained no hazardous chemicals, were relatively nontoxic, and were used in very small quantities. Radiological surveys show no radiological contamination above background levels at this site. Since the data are reliable and no hazardous constituents have been released into the pit, there is no risk associated with this site.

ARA-13, OU 5-11 [Sanitary Sewer Leach Field and Septic Tank (ARA-740)]

ARA-13 consists of a septic tank, a distribution box, and a drain field. Sanitary wastes were disposed into the system from 1969 to 1980. Between 1980 and 1983, in addition to sanitary wastes, small quantities of hazardous laboratory wastes were diverted to this system. Contents of the system were sampled. Analyses did not yield concentrations sufficient to generate an unacceptable risk. No radioactive materials were disposed into the sanitary sewer system.

There is no evidence of contaminant migration. It is believed that the septic tank, distribution box, and associated piping are in good condition. Low-level concentrations of arsenic, barium, beryllium, mercury, nickel, selenium, and thallium were found in four samples taken from the leach field. The metals were detected at depths between 1 and 6 feet. However, concentrations were lower than background metal concentrations found in soils at other operable units at the INEL. A risk evaluation has determined this site does not pose an unacceptable risk to human health or the environment.

Soil Contamination Sites

The following two low probability hazardous sites were classified as potential soil contamination sites. One site was suspected of having received hazardous waste and possible oil spillage, but subsequent site evaluation determined that no such disposal activities had occurred. The other site was a dump for a variety of materials including piping with asbestos insulation and some heavy metals. The asbestos has been removed and subsequent evaluation of the site indicated that remaining contaminant concentrations do not pose an unacceptable risk to human health or the environment.

PBF-07, OU 5-03 [PBF Reactor Area Oil Drum Storage (PER-T13)]

PBF-07 is the location of an oil drum storage area adjacent to building PBF-625. The site consists of a wholly enclosed 4 x 8-foot concrete pad, which is used to temporarily store two or three 55-gallon drums of used oil and lubricant until picked up for recycling. The site initially only had a steel roof covering the oil drums, but in 1990, the pad was enclosed with metal corrugated siding and a drip pan was installed.

There have been no recorded oil spills and the site shows no physical evidence of spillage. No hazardous substances have been stored on the site and a radiological survey conducted in 1991 detected no radiological activity above background. Therefore, this site does not pose an unacceptable risk to human health or the environment.

PBF-13, OU 5-03 (PBF Reactor Area Rubble Pit)

PBF-13 is situated north of the PBF cooling tower. The rubble pit was first used to dispose of soil and basalt pieces excavated during construction of PBF in the late 1960s. After the construction of PBF, the area was used as a dump for a variety of construction materials until approximately the mid-1970s. Fence posts mark the location of the 75 x 45 x 10-foot dumping area. The dump received lumber, rusting empty barrels and cans, cable, concrete, and piping with asbestos insulation.

The risk associated with asbestos is considered low because all visible material containing asbestos was removed from the pit in 1993. Any small quantity that may remain was covered when the pit was backfilled with 3 to 12 feet of clean soil and basalt rubble. Soil samples indicated the presence of cadmium, chromium, lead, nickel, and zinc in small amounts. Volatiles detected at very low concentrations were acetone and toluene. Contaminant concentrations were not high enough to pose an unacceptable risk at this site.

Underground Storage Tanks

The following two underground storage tank sites were evaluated as low probability hazardous sites. One of the tanks, its contents, associated piping, and contaminated soil have been removed. This site is now paved and used for storage. The other tank was filled with sand, disconnected from the associated piping, and abandoned in place.

These tanks had contained petroleum products, and in each case, a risk evaluation determined that the possible residual soil contamination for these contaminants would not pose an unacceptable risk to human health or the environment.

PBF-14, OU 5-04 [Inactive Gasoline Tank (in front of PBF-612)]

PBF-14 is the site of a buried 500-gallon gasoline tank once used to power an emergency generator. The tank was in service from 1960 to 1964 when the SPERT-II reactor was functional. The tank was filled with sand, abandoned in place, and the fuel line disconnected. Two posts prevent parking on the tank site. The top of the tank is about 2 feet below the surface.

Soils were excavated down to the top of the tank to a depth of 2 to 2.5 feet; no stained soils were visible; volatile organic compounds were not detected; and there were no holes observed in either the tank or associated piping. Therefore, a risk to human health and the environment is not present.

PBF-19, OU 5-04 (Inactive Fuel Oil Tank)

PBF-19 was a 3,000-gallon underground storage tank associated with the furnace in the reactor building. A Site Work Release from 1986 documents that the tank and any contaminated soil associated with the tank were removed, but corroborating documentation was not found. The area over the tank location has been paved and the area now used for storage.

Although evidence that the tank was removed versus abandoned in place is not confirmed, it is likely that the tank and any associated contaminated soil were removed in 1986. The area is now used for storage, and any remaining contamination associated with the underground storage tank is covered with pavement, thus inhibiting any migration. Therefore, even if a potential source is still in place at PBF-19, a threat to human health or the environment is not present.

Public Involvement Activities

As soon as you receive and review this plan, you are encouraged to call any of the phone numbers listed in this plan to contact representatives of the DOE, INEL Community Relations Plan office, state of Idaho, or Region 10 of the EPA. You may wish to ask questions, request a briefing, or seek additional background information related to this proposed plan.

Public Involvement Activities

Members of the public are invited to submit written comments during the May 3, 1995 to June 3, 1995 public comment period. In addition, public meetings will be held at the following locations. Representatives from the agencies will be available to discuss concerns and issues related to this proposed plan from 6:30 to 7 p.m. at each location. At 7 p.m., there will be a presentation by the agencies, followed by a question and answer session, and an opportunity to make written and/or verbal public comments. **A court reporter will prepare a transcript of the public meetings and will record public comments received.**

Idaho Falls

Tuesday, May 16

Engineering
Research Office
Building
Room 159
(off the main lobby)
2525 N. Fremont

Boise

Wednesday, May 17

Earl Chandler Building
(Division of Environmental
Quality)
Conference Rooms A and B
1410 N. Hilton

Moscow

Thursday, May 18

Palouse Empire Mall
1850 Pullman Road

(Comments continued, attach additional pages if necessary)

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This postage-paid comment form is provided for your convenience in submitting written comments to DOE concerning the Stationary Low-Power Reactor 1 / Boiling Water Reactor Experiment I burial grounds and No Further Action sites. Please provide your name and mailing address if you would like to receive a copy of the Record of Decision and Responsiveness Summary that addresses public comments received on these projects. Attach additional sheets if necessary.

Name: ______________________________

Address: ____________________ ***City:*** __________ ***State:*** ____ ***Zip:*** ____

Comments: ______________________________

(continued next page)

Idaho National Engineering Laboratory

INEL Environmental Restoration Program
P.O. Box 2047
Idaho Falls, ID 83403-2047

Address Correction Requested

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