Proposed Plan for Waste Area Group 3 at the

Idaho Chemical Processing Plant

Idaho National Engineering and Environmental Laboratory

DIVISION OF ENVIRONMENTAL QUALITY

Public Comment Period October 23 to December 22, 1998

(*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 and other helpful notes are provided in the margins.)

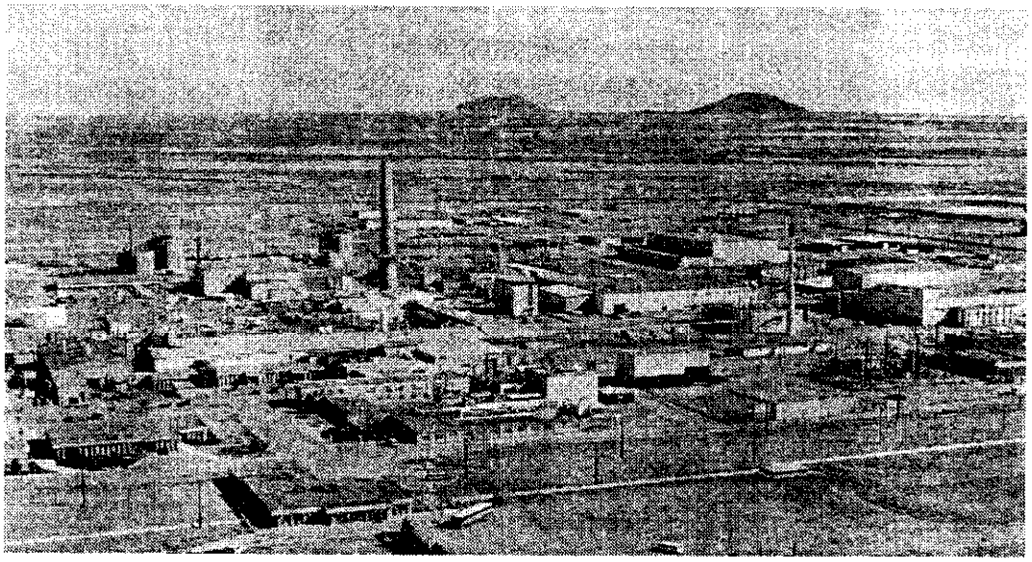


*Photo of the Idaho Chemical Processing Plant **(INTEC)***

Inside This Plan

Public Meetings/ Briefings*

Idaho Falls
November 16, 1998
Shilo Inn

Twin Falls
November 17, 1998
Shilo Inn

Boise
November 18, 1998
Doubletree Downtown

Moscow
November 19, 1998
Best Western University Inn

***See Page 49 for details**

Introduction

A ***remedial investigation/baseline risk assessment (RI/BRA)*** has been conducted to determine the nature and extent of contamination at the Idaho Chemical Processing Plant (ICPP) (Figure 1) located at the Idaho National Engineering and Environmental Laboratory (INEEL). Information from this study was used to develop alternative ways to remediate contaminated soils and groundwater identified at release sites in a ***Feasibility Study (FS)*** and ***FS Supplement***. Based on these studies, the agencies have evaluated selected remedial alternatives and have identified preferred alternatives to address human health and environmental concerns. The purpose of this ***Proposed Plan*** is to summarize the information that was evaluated in these three studies in order to obtain public input on the proposed alternatives. The preferred alternatives satisfy ***remedial action objectives (RAOs)*** for the protection of human health and the environment developed in the FS that apply to the Snake River Plain Aquifer (SRPA), perched water, surface soils, and other environmental media.

This Proposed Plan has five objectives: (1) to fulfill the requirements of the ***Comprehensive Environmental Response, Compensation and Liability Act***

INTEC—Idaho Nuclear Technology and Engineering Center is the contemporary name for the Idaho Chemical Processing Plant (ICPP). The former name is used throughout this document to be consistent with companion documents published before the name change.

Remedial investigation/baseline risk assessment (RI/BRA)—studies required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) to characterize the nature and extent of contamination because of past releases of hazardous and radioactive substances to the environment and to assess the risks to human health and the environment from potential exposure to contaminants.

Feasibility Study (FS)—an evaluation and analysis of the potential cleanup options available to remediate a contaminated site or group of sites.

FS Supplement—an evaluation and analysis of additional alternatives to supplement alternatives presented in the FS.

Proposed Plan—document requesting public input on the remediation activities proposed at a site.

Remedial action objectives (RAOs)—risk or concentration levels that are established to protect human health and the environment. These requirements must be satisfied by the proposed remedial alternatives.

Comprehensive Environmental Response, Compensation and Liability Act—a federal law that establishes a program to identify, evaluate, and remediate sites where hazardous substances may have been released to the environment.

Waste area group (WAG)—one of the 10 administrative management areas established under the Idaho National Engineering and Environmental Laboratory (INEEL) Federal Facility Agreement and Consent Order (FFA/CO) to facilitate evaluation and remediation of contaminated areas. The ICPP is designated WAG 3.

Federal Facility Agreement and Consent Order (FFA/CO)—an agreement between the U.S. Environmental Protection Agency (EPA), State of Idaho, and U.S. Department of Energy (DOE) to evaluate waste disposal sites at the INEEL and perform remediation if necessary.

Perched water—groundwater separated from an underlying body of groundwater by unsaturated rock.

Update Fact Sheets—brief summaries of the ongoing and completed activities at WAG 3.

(CERCLA) Section 117(a); (2) to identify the preferred remedial actions for the release sites; (3) to describe the other remedial options developed and evaluated in detail in the FS and the FS supplement; (4) to solicit public review and comment on all the potential remedial alternatives described; and (5) to provide information on how the public can be involved in the remedy selection.

Because of the complexity of the problems at the ICPP, ***Waste Area Group (WAG)*** 3, and to expedite the cleanup process, the contaminant release sites were subdivided into 13 operable units (OUs) in the ***Federal Facility Agreement and Consent Order (FFA/CO)*** based on similar wastes and projected remedial actions. Preliminary investigations were completed for OUs 1 through 12. OU 3-13 represents a comprehensive evaluation of the previously identified release sites at the ICPP. Additional sites designated as "no action" sites in the FFA/CO were determined not to require remedial action.

The problems at the ICPP are complex because of the ongoing operations at the plant and the presence of radionuclide and nonradionuclide contaminants. Contaminants in the SRPA have several sources contaminated including soil, ***perched water***, and the former injection well. Some of the identified release sites were eliminated from further action through risk assessment. These sites are designated as "no action" or "no further action" sites. The remaining sites were evaluated in the FS to develop appropriate cleanup alternatives for the contaminated media.

This Proposed Plan highlights important information from the OU 3-13 remedial investigation/feasibility study (RI/FS) (Report Numbers DOE/ID-10534 [RI/BRA] and DOE/ID-10572 [FS]) and the FS supplement (DOE/ID-10619). This plan is not a substitute for the RI/FS. For more detailed information, the RI/FS, the FS supplement, and the administrative record may be found at the INEEL Information Repositories listed in the sidebar on Page 4. Additional summary information can also be found in the ***Update Fact Sheets*** for WAG 3.

In order to develop and analyze remedial alternatives that satisfy the RAOs, sites with similar contaminants of concern, accessibility, or geographic proximity were segregated into seven groups. The groups identified include:

- Tank Farm Soils (Group 1)
- Soils Under Buildings and Structures (Group 2)
- Other Surface Soils (Group 3)
- Perched Water (Group 4)
- Snake River Plain Aquifer (Group 5)
- Buried Gas Cylinders (Group 6)
- SFE-20 Hot Waste Tank System (Group 7).

Remedial alternatives were developed and evaluated for each group. Detailed descriptions of each group and the remedial alternatives appear later. Alternative evaluation consisted of a screening step followed by detailed analyses of alternatives that passed the screening. The agencies have selected preferred alternatives for each group based on these analyses. The preferred alternatives include the following:

Tank Farm Soils Interim Actions (Group 1)

- Continue Existing Institutional Controls

- Additional Monitoring
- Provide Surface Water Control to Minimize Infiltration through Potentially Contaminated Soils

Soils Under Buildings and Structures (Group 2)

- Continue Existing Institutional Controls
- Containment in Place Using an Engineered Barrier
- Contingent Removal and Disposal in an On-Site ***INEEL CERCLA Disposal Facility (ICDF)***

Other Surface Soils (Group 3)

- Continue Existing Institutional Controls
- Removal and On-Site Disposal in an On-Site ICDF

Perched Water (Group 4)

- Continue Existing Institutional Controls
- Aquifer Recharge Controls

Snake River Plain Aquifer (Group 5)

- Continue Existing Institutional Controls
- Additional Monitoring
- Contingent Remediation

Buried Gas Cylinders (Group 6)

- Removal
- Treatment and Disposal

SFE-20 Hot Waste Tank System (Group 7)

- Removal
- Treatment and Disposal.

More detailed descriptions of these preferred alternatives and the selection process, including evaluation of all alternatives are provided in subsequent sections of this document. Community input will be considered by the U. S. Department of Energy (DOE), the U. S. Environmental Protection Agency (EPA), and the State of Idaho Department of Health and Welfare (IDHW) as they reach a final decision for cleanup of the ICPP.

Agency Involvement

This Proposed Plan is issued by the DOE in concert with the EPA and IDHW, collectively referred to as "the agencies." The issuance of this plan is part of the agencies' public participation responsibility. In this document, the agencies have identified preferred alternatives based on information available, but have not selected a remedy. Changes to the preferred alternatives, or a change from the identified

INEEL CERCLA Disposal Facility (ICDF)—an ARAR-compliant landfill designed to prevent future degradation of soils or groundwater and will accept soils and debris from CERCLA remedial actions throughout the INEEL. The concept is more thoroughly discussed following the alternative development evaluation recommendation section of this plan.

How You Can Participate

Whether you are new to the INEEL 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 at the Information Repository locations listed on Page 4; and access documents via the internet at http://ar.inel.gov/home.html
- ***Call*** the INEEL'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 the cover and on Page 49
- ***Comment*** on this plan at the meeting or submit written comments (see postage-paid comment form on back cover)
- ***Contact*** state of Idaho, EPA Region 10, or DOE project managers (see Pages 4 and 5).

Responsiveness summary—a part of the Record of Decision (ROD) that summarizes and provides responses to comments received on a proposed action for a site during the public comment period.

Record of Decision—a public document that identifies the selected remedy at a site, outlines the process used to reach a decision on the remedy, and confirms that the decision complies with CERCLA.

INEEL Information Repositories

INEEL Technical Library
DOE-ID Public Reading Room
1776 Science Center Drive
Idaho Falls, ID 83415
(208) 526-1185

University of Idaho
University of Idaho Campus
Moscow, ID 83843
(208) 885-6344

Albertsons Library
Boise State University Campus
1910 University Drive
Boise, ID 83725
(208) 385-1621

Additionally, the Administrative Record is available on the Internet at http://ar.inel.gov/home.html.

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 INEEL Federal Facility Agreement and Consent Order, which establishes the scope and schedule of remedial investigations at the INEEL. Correspondence by the Division of Environmental Quality staff concerning this project can be found in the Administrative Record for this project under Operable Unit 3-13.

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) 373-0285, (800) 232-4635

preferred alternatives, would be made if public comments or additional data (such as new contaminant information) indicate that such a change would result in a more appropriate remedy. The agencies will make final remedy selections for the OU 3-13 sites only after the public comment period (October 23 to December 22, 1998) has ended and information submitted during that time has been reviewed and considered by the agencies. The public comment period has been increased to 60 days because of the complex and controversial issues involved. The ***responsiveness summary*** section of the ***Record of Decision (ROD)*** will contain the public comments received, the agencies' responses to those comments, and the final remedial decisions for the OU 3-13 sites.

Community Acceptance

Community acceptance is one of the nine criteria (sidebar definition on Page 20), established under CERCLA, that the agencies must include in an evaluation and selection of remedial alternatives. The agencies will determine the degree of community acceptance through open dialogue with citizens at public meetings and by the comments received from the public concerning the remedial alternatives presented in this Proposed Plan. This interaction is critical in the CERCLA process to make effective environmental decisions that are protective of human health and the environment. Although the agencies have identified preferred alternatives for controlling risks at the ICPP, the public is encouraged to review and comment on all the alternatives, not just the preferred alternatives (all documents are distributed to the INEEL Information Repositories for the public review and comment period). Additional information is available in the Administrative Record for OU 3-13. Public input on the OU 3-13 Proposed Plan should be submitted directly to the DOE, EPA (Region 10), or IDHW.

INEEL Site Background

The INEEL occupies 890 mi^2 of predominantly flat, semiarid, sagebrush desert terrain on the northwestern portion of the Eastern Snake River Plain in southeastern Idaho. Drainages within and around the Eastern Snake River Plain recharge the Snake River Plain Aquifer, which underlies the region. The top of the aquifer is about 450 ft below the ICPP and is overlain by lava flows and sedimentary interbeds and about 45 ft of alluvium deposited by the Big Lost River.

The INEEL lands are within the aboriginal land area of the Shoshone-Bannock Tribes. The Tribes have used the land and waters at the INEEL for fishing, hunting, plant gathering, medicinal, religious, ceremonial, and other cultural uses since time immemorial. These lands and waters provided the Tribes their home and sustained their way of life. The record of the Tribes' original presence at the INEEL is considerable, and DOE has documented in excess of 1,500 prehistoric and historic archeological sites at the INEEL.

ICPP Site Background

The ICPP, located in the south-central area of the INEEL (Figure 2), began operations in 1952. Historically, spent nuclear fuel from defense projects was reprocessed to separate reusable uranium from spent nuclear fuel.

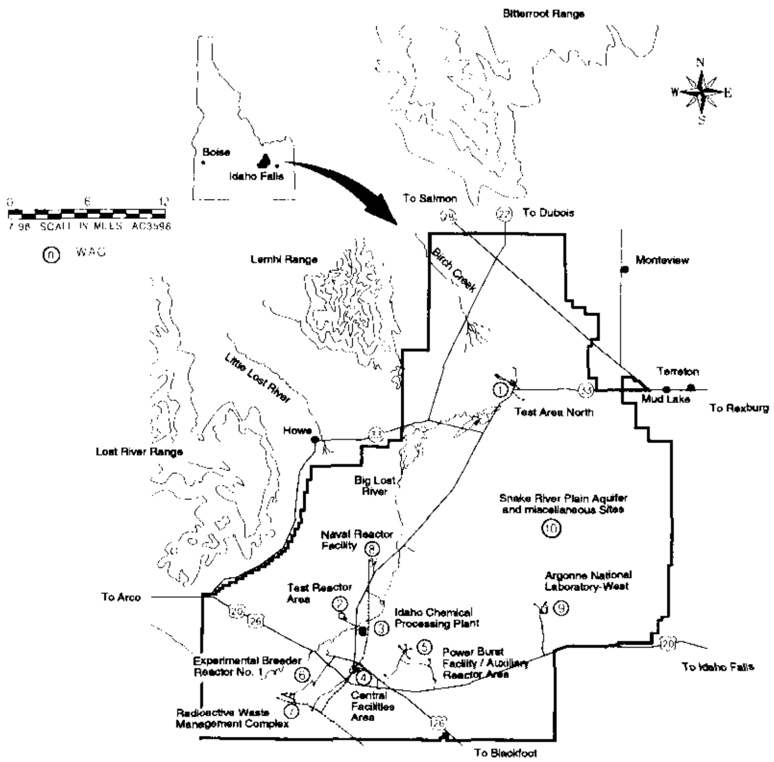


Figure 2. Location of the ICPP (WAG 3) and other WAGs at the INEEL.

The DOE discontinued reprocessing in 1992. Liquid waste generated from this activity is stored in an underground tank farm. This liquid waste continues to be treated using a ***calcining process*** to convert the liquid to a more stable granular form. Calcined solids are stored in stainless steel bins. Disposition of liquid waste and calcined solids will be addressed in the INEEL High Level Waste and Facility Disposition Environmental Impact Statement. The current mission for the ICPP is to receive and temporarily store spent nuclear fuel and radioactive waste for future disposition, manage waste, and perform remedial actions.

Because of soil and groundwater contamination resulting from operations at the INEEL, the Site (including the ICPP) was placed on the ***National Priorities List (NPL)*** in November 1989. The FFA/CO was negotiated with the EPA and IDHW to direct the cleanup activities at the INEEL. To facilitate management of the cleanup activities, the INEEL was subdivided into 10 WAGs. The ICPP is designated as WAG 3. Under federal law (CERCLA), risks posed by hazardous substances at NPL sites must be evaluated and appropriate remedial actions implemented, if necessary, to reduce human health and environmental risks to acceptable levels.

Remedial Investigation Summary

The RI/BRA, directed by the agencies, was conducted to evaluate the soil and groundwater contamination at the ICPP. The RI/BRA was completed in 1997. Data collected during the investigation was evaluated to determine the nature and extent of contamination at the plant and to assess the potential impact to human health and the environment from exposure to contaminants in air, soil, and groundwater. The results of the RI/BRA activities indicate that soil at certain release sites and groundwater contamination pose a potential risk, above acceptable levels, to human health and the environment.

The U.S. Environmental Protection Agency is one of the three agencies in the INEEL Federal Facility Agreement and Consent Order, which establishes the scope and schedule of remedial investigations at the INEEL. Correspondence by the Region 10 staff concerning this project can be found in the Administrative Record under Operable Unit 3-13.

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, Washington 98101
(206) 553-7261

Calcining process—a process of heating a liquid waste to high temperatures resulting in water being driven off and a small volume of residual solids being left that can be stored or properly disposed.

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

The U.S. Department of Energy is one of the three agencies identified in the INEEL Federal Facility Agreement and Consent Order, which establishes the scope and schedule of remedial investigations at the INEEL.

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

Mr. Jerry Lyle
Office of Program Execution
P.O. Box 2047
Idaho Falls, ID 83403-9901

For additional information regarding the Environmental Restoration Program at the INEEL, call (800) 708-2680 or (208) 526-4700.

Ninety-five release sites have been identified at the ICPP. Risk evaluations eliminated 51 of the release sites from further consideration because calculated risks were within acceptable limits. These sites have been designated "no action" and "no further action" sites. Four other sites, CPP-37, -38, -65, and -66, are managed under other INEEL environmental programs. Sites CPP-37 and CPP-66 will be closed pursuant to the Idaho Solid Waste Rules and Standards (IDAPA 16.01.06). CPP-37 is a pair of gravel pits and CPP-66 is the Steam Plant fly ash pit. CPP-38 is the asbestos materials in the building structures of buildings CPP-606, 640, 644, and 648. Closure will be performed under the INEEL asbestos abatement program. CPP-65 is the CPP Sewage Plant Lagoons, which will be closed pursuant to the Idaho Waste Water Land Application Rules (IDAPA 16.01.02). The remaining 40 release sites were shown to require remedial action to mitigate risk. These sites, except for the perched water, Group 4 (Site CPP-83), are shown on Figures 3, 4, 5, 6, 7, and 8. Perched water

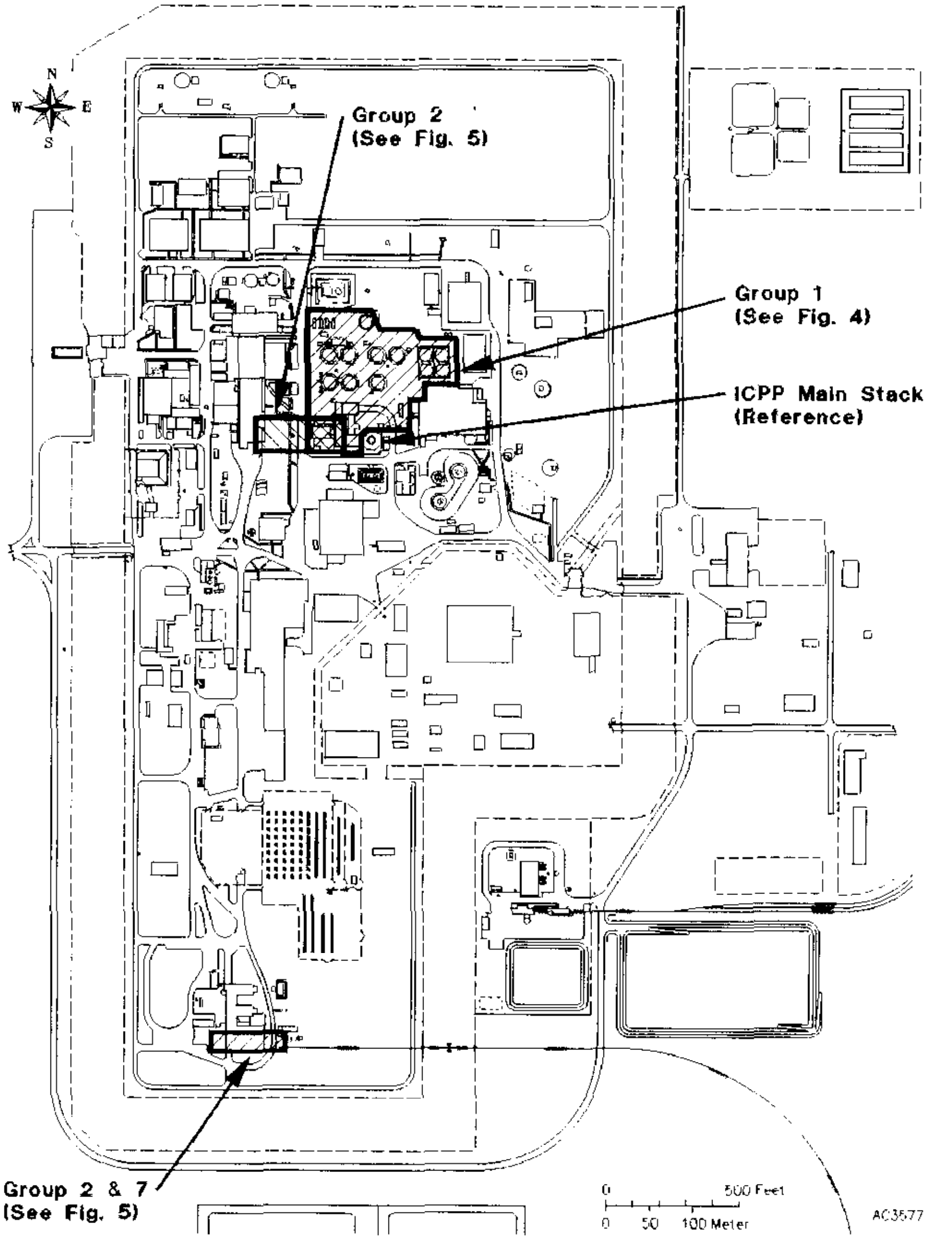


Figure 3. General location of the release site groups at the Idaho Chemical Processing Plant.

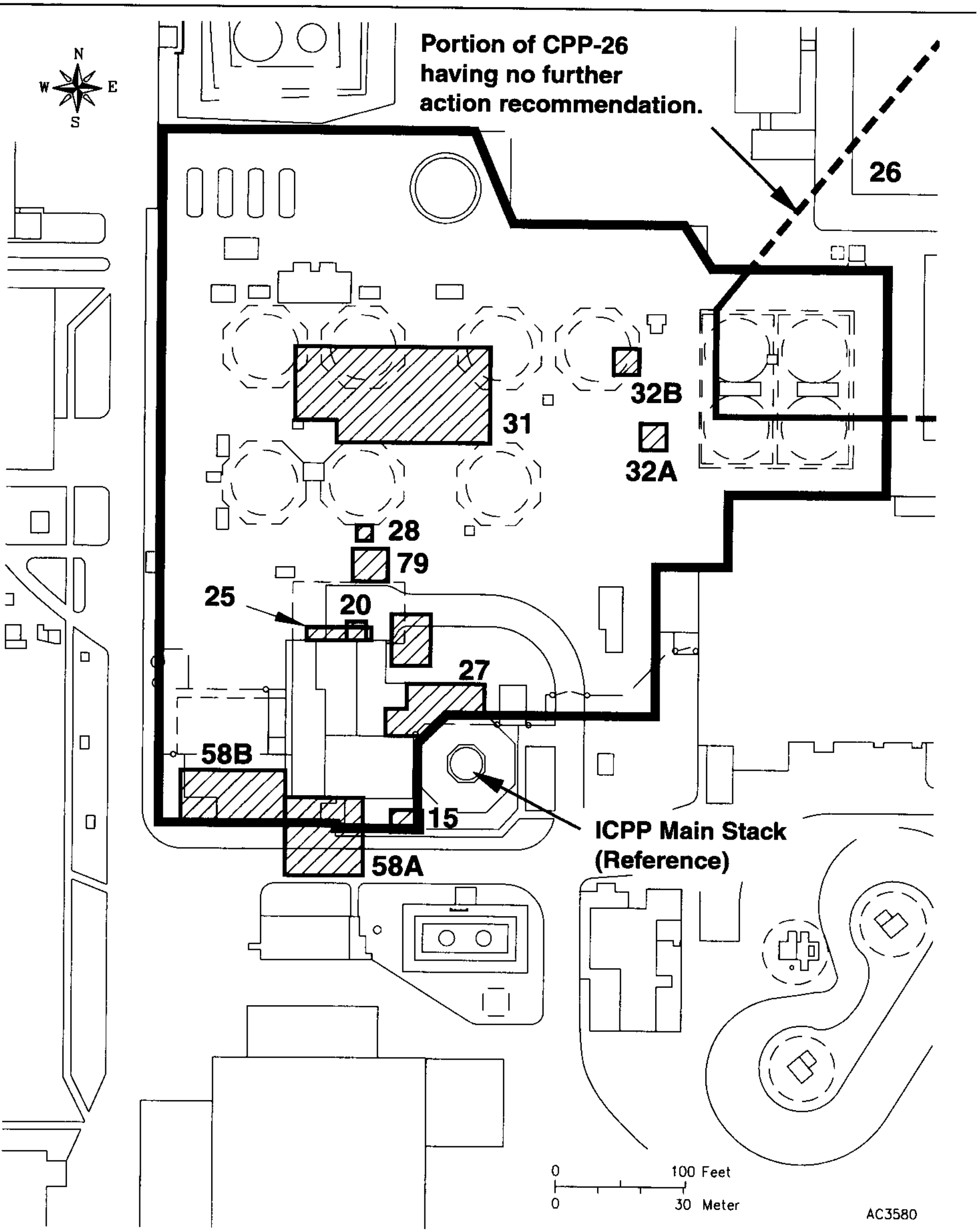


Figure 4. Group 1: Tank Farm Soils numbered release sites.

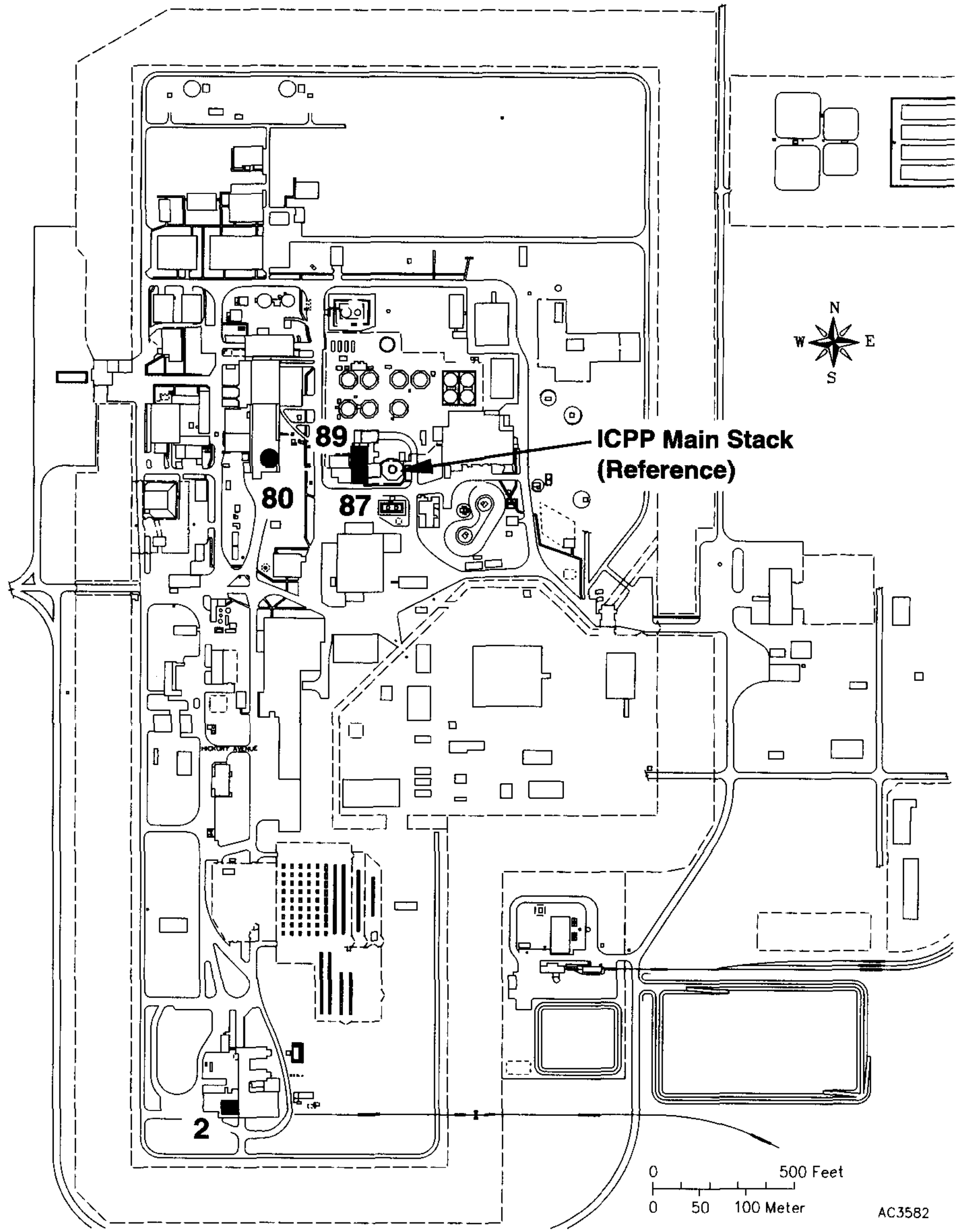


Figure 5. Group 2: Soils Under Buildings and Structures numbered release sites.

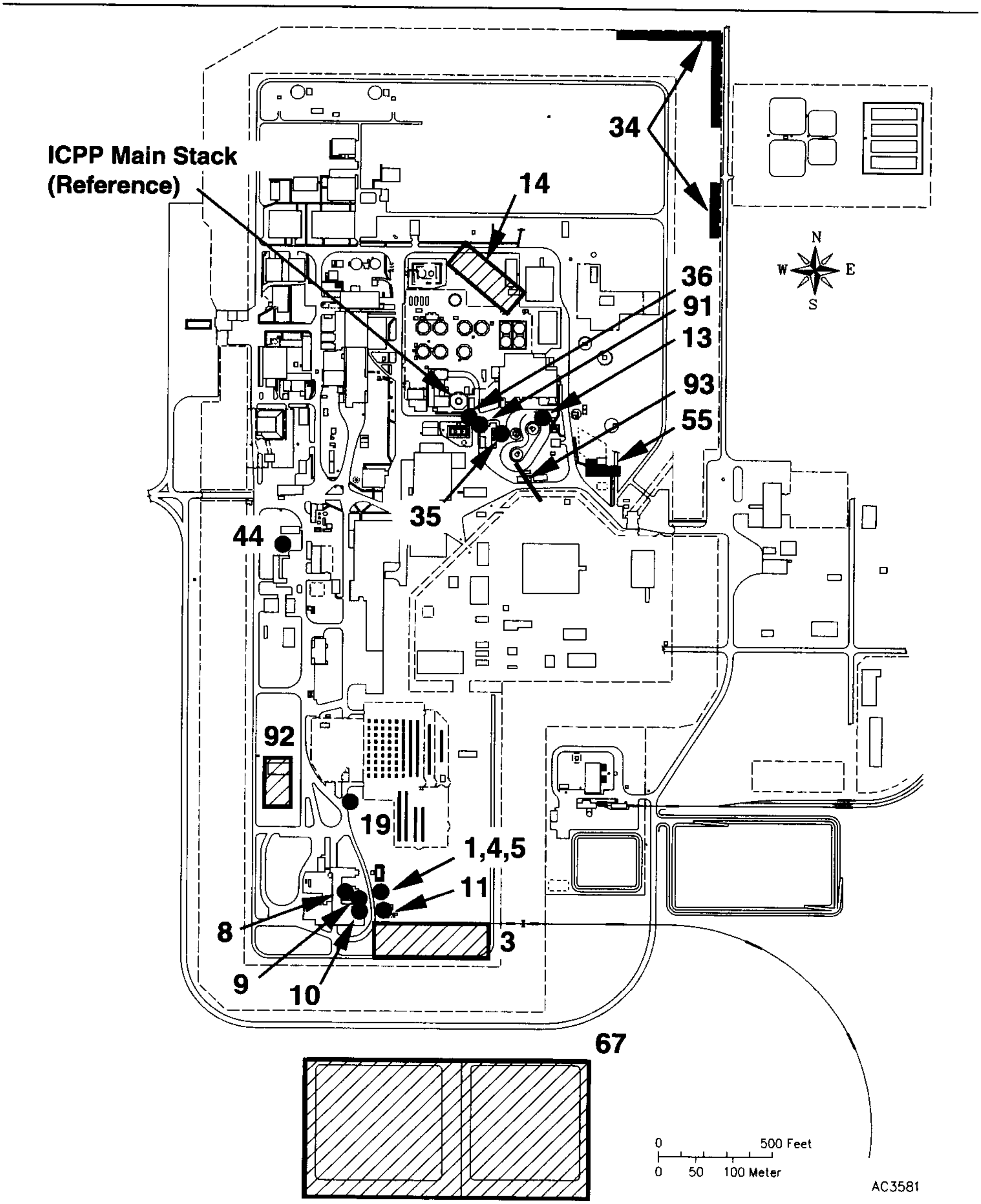
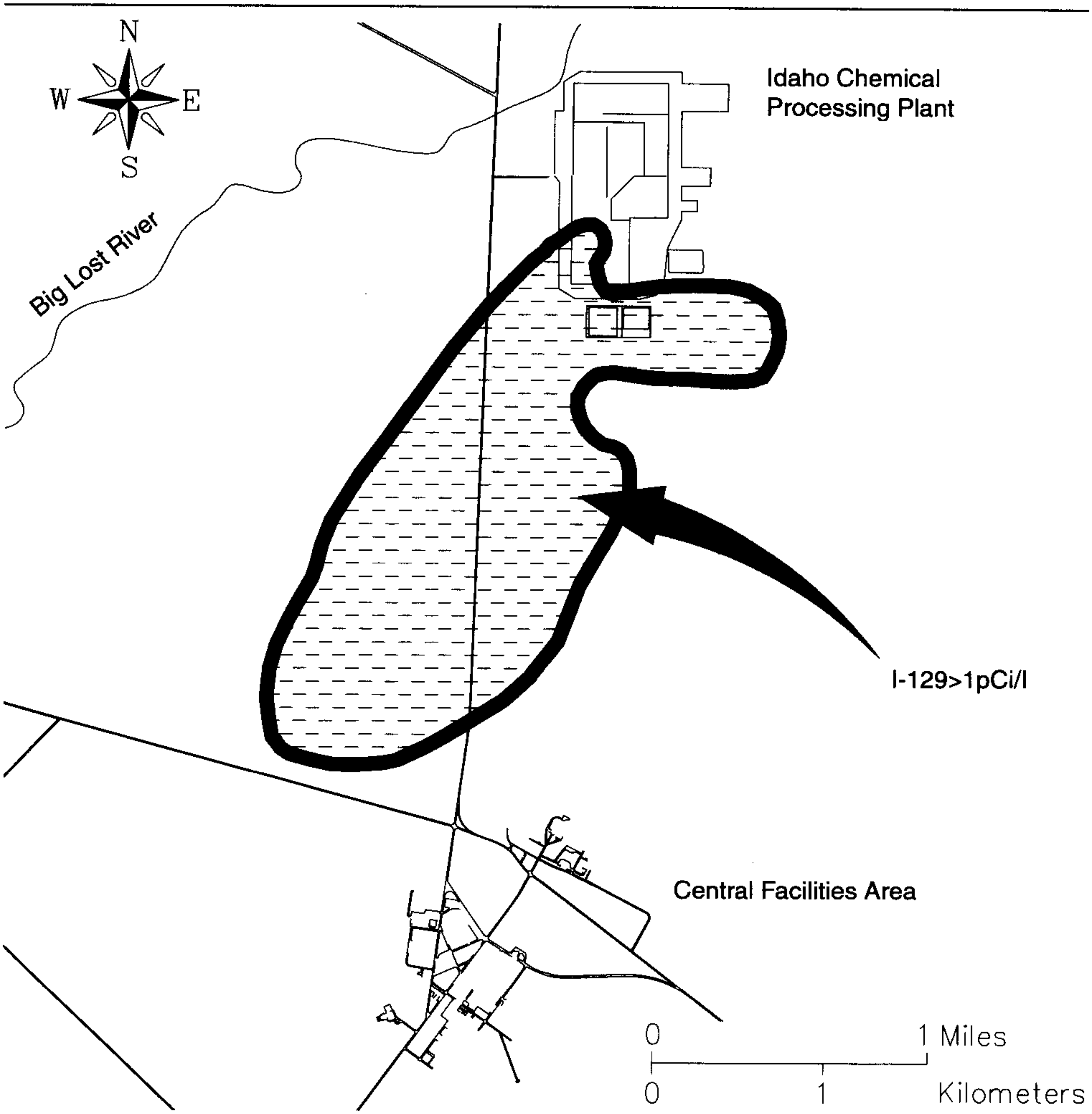


Figure 6. Group 3: Other Surface Soils numbered release sites.



SRPA - Group 5
(CPP-23)

Figure 7. Group 5: Estimated extent of the Iodine-129 plume in the Snake River Plain Aquifer.

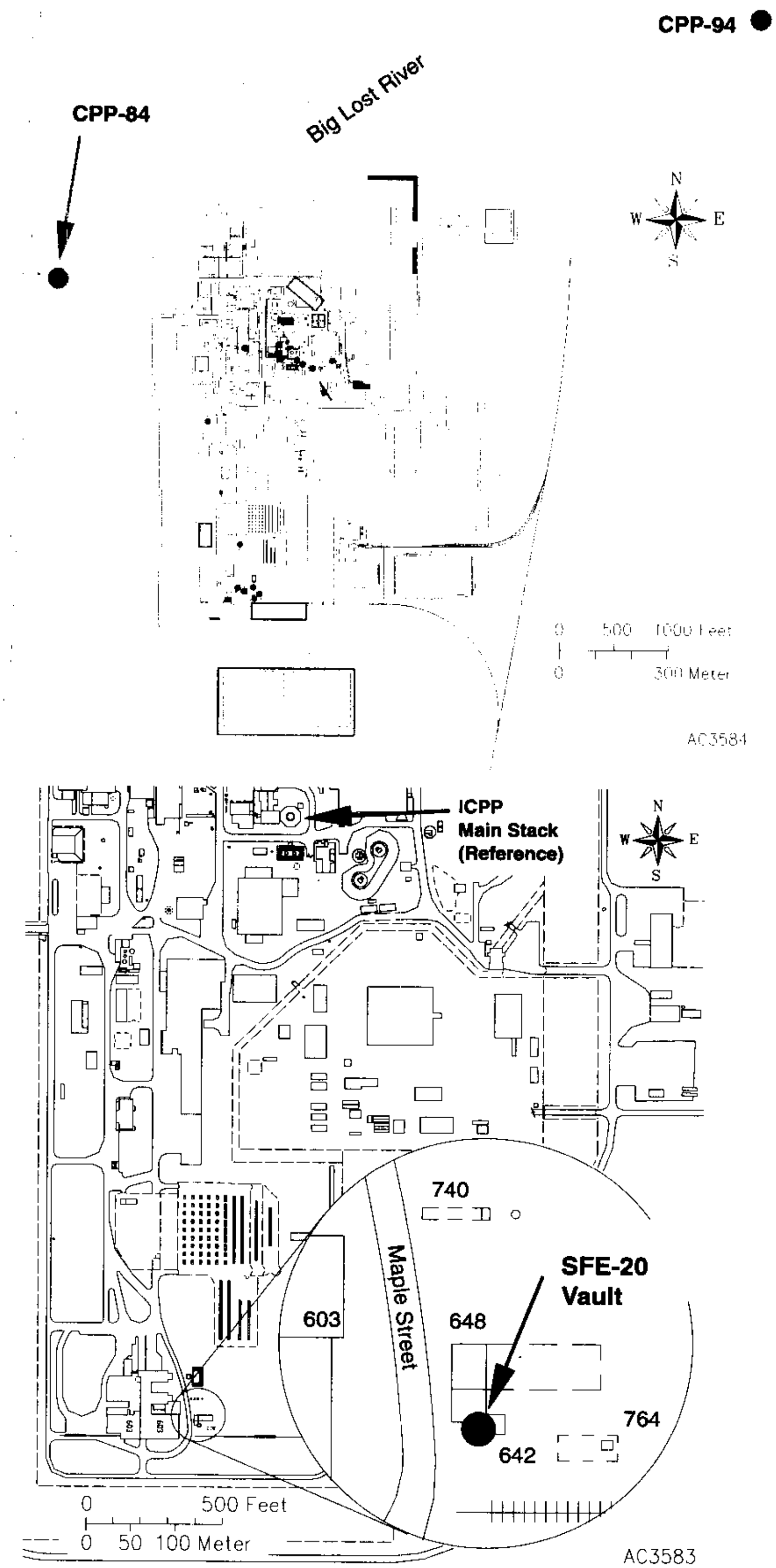


Figure 8. Group 6: Buried Gas Cylinders numbered release sites; Group 7: SFE-20 Tank System numbered release sites.

underlies most or all of the ICPP. No figure is presented because the limits of the perched water are not well defined. Cleanup alternatives were developed for these sites in the FS and FS supplement and are summarized in this Proposed Plan. The following paragraphs briefly describe the release sites that pose unacceptable risks to human health and the environment. Detailed descriptions of each individual release site are provided in the RI/BRA.

A site conceptual model showing the relevant ICPP features, subsurface hydrogeologic conditions, contaminant sources, and potential receptor exposure pathways is shown in Figure 9. Figure 9 is a graphical representation of contaminant exposure pathways and indicates how receptors, under current and future land-use scenarios, may become exposed to contaminants in air, soil, and groundwater. The figure illustrates the interrelationship between soil contaminant releases, perched water recharge by the Big Lost River and the ICPP percolation ponds, and leaching and transport of soil contaminants to the perched water and the aquifer. In addition, the potential risks at the site posed by direct contact with contaminated soils, groundwater ingestion, and air inhalation are also graphically represented. Contaminated soil under the tank vaults and other contaminated surficial soil areas represent a contamination source to the underlying perched water, which in turn represents both a contamination source and transport mechanism to the Snake River Plain Aquifer. Additional water, primarily from the existing percolation ponds and the Big Lost River, drives contamination downward to the Snake River Plain Aquifer.

Contaminants of Concern (COCs)—radionuclide or nonradionuclide contaminants that pose a risk to human health or the environment and are addressed by the remedial alternatives.

Humans could be exposed to contamination via direct ingestion, direct exposure, or ingestion of contaminated groundwater. Ecological receptors could be exposed via direct contact with and ingestion of contaminated soils. The ***contaminants of concern (COCs)*** are identified in the side bar next to the specific group description.

Tank Farm Soils (Group 1)

COCs at Group 1 Sites

Cesium-137
Europium-154
Plutonium-238
Plutonium-239
Plutonium-240
Plutonium-241
Strontium-90
Uranium-235

The Tank Farm Soils (Figure 4) consist of release sites in OUs 3-06, 3-07, 3-08, and 3-11. The sites are located in the area of the Tank Farm (Sites CPP-20, -25, -26, -28, -31, -32, and -79) and adjacent to the Process Equipment Waste (PEW) evaporator building (Sites CPP-15, -27, -33, and -58). These sites consist of soil contamination that resulted from spills and pipeline leaks of radioactive liquids from plant liquid transfer operations. The contaminated soils at the Tank Farm comprise about 95% of the contaminant inventory at the ICPP. No evidence has been found to indicate that any tanks have leaked. Limited site investigations have been conducted at these sites because many of the spill areas occur in operational and radioactive areas.

Based on the results of drilling and sampling, the extent of contamination is generally localized at the site of the spill or leak, but contamination has been found to extend to the soil/basalt interface at approximately 45 ft below the ground surface. Contaminants are suspected to have migrated into the basalt and the underlying Snake River Plain Aquifer. Because current information regarding the nature and extent of Tank Farm contamination is inadequate to support selection of a final remedy, a separate RI/FS for the Tank Farm, is under way. The Tank Farm is now referenced as a separate operable unit, OU 3-14. The OU 3-14 RI/FS will further investigate contamination at the Tank Farm Group and develop alternatives for a final remedy. An interim action for the Tank Farm Group is presented in this Proposed Plan.

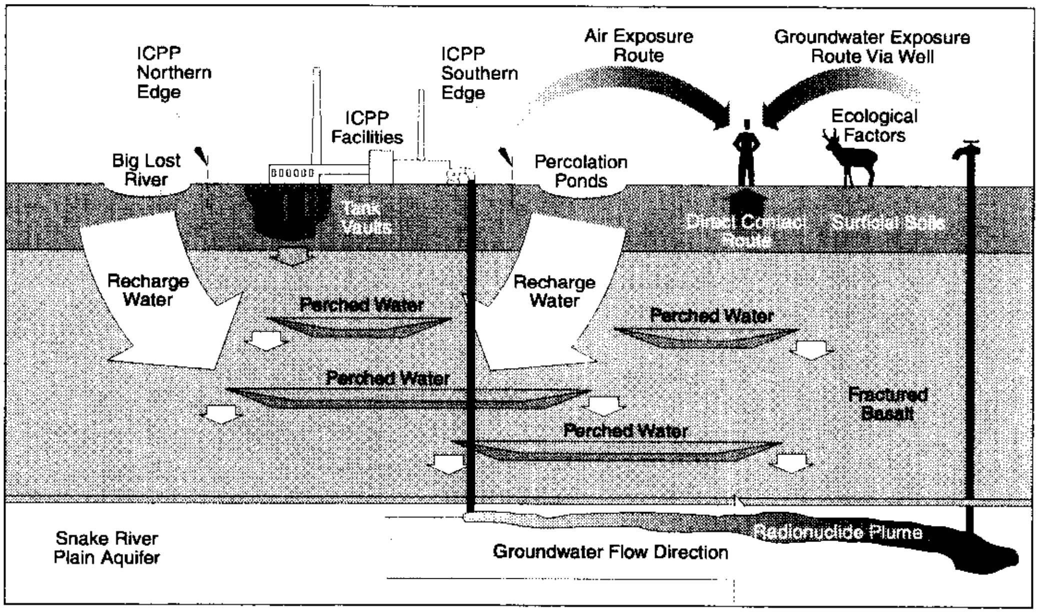


Figure 9. ICPP Site conceptual model.

The results of the investigations performed indicate that the principal risks posed by the Tank Farm Soils sites are from external exposure to radionuclides and leaching and transport of radionuclides to the underlying perched water and to the Snake River Plain Aquifer. In addition, nonradionuclide constituents may be present in Tank Farm soils; the presence of such contamination will be addressed in the OU 3-14 RI/FS.

Soils Under Buildings and Structures (Group 2)

The Soils Under Buildings and Structures are comprised of release sites in OUs 3-09, 3-12, and 3-13 that occur beneath ICPP buildings and structures, and include Sites CPP-02, -80, -87, and -89 (see Figure 5). These sites consist of soil contamination that resulted from past hazardous or radioactive liquid spills, leaks, and plant operations. Site CPP-02 is an old french drain that was abandoned and partially excavated in 1966 and is located beneath Building CPP-603. Site CPP-80 resulted from a hazardous, radioactive liquid condensate leak from the Building CPP-601 vent tunnel drain. Site CPP-87 is located beneath the vapor off-gas blower core cell in Building CPP-604. Site CPP-89 is a tunnel excavation located beneath Buildings CPP-604 and -605. Contaminated soils from the tunnel were partially excavated, boxed, and stored at the plant.

Because of the inaccessibility of most of these sites, only limited soil characterization data are available. Knowledge of the associated processes and waste streams at these sites and an estimate of the potential leak or spill volume determined the types and quantities of contaminants that may be present at these sites. The soils at Sites CPP-87 and -89 have been sampled and analyzed. The results of the RI/BRA indicate that the principal threats posed by these sites are leaching and transport of contaminants to the perched water and potentially to the Snake River Plain Aquifer. Other potential risks are minimized by isolation of the contaminated soils by the overlying building or structure.

COCs at Group 2 Sites

- Americium-241
- Cesium-137
- Cobalt-60
- Iodine-129
- Neptunium-237
- Plutonium-228, -239/240, -241
- Strontium-90
- Technetium-99
- Tritium (H-3)
- Uranium-235
- Mercury
- Arsenic
- Chromium

Other Surface Soil Sites (Group 3)

COCs at Group 3 Sites

Americium-241
Cesium-137
Cobalt-60
Europium-152 and -154
Plutonium-128, -239/240, -241
Strontium-90
Uranium-235
Mercury
Lead
Chromium

The Other Surface Soil Sites consist of release sites in OUs 3-02, 3-03, 3-05, 3-08, 3-09, 3-10 and 3-13. The sites are located in areas near Building CPP-603 (Sites CPP-01, -03, -04, -05, -08, -09, -10, -11, and -19), Building CPP-633 (Sites CPP-36 and -91), the calcined solids storage bins (Sites CPP-13, -35, and -93), disposal trenches (Site CPP-34), the old sewage treatment plant (Site CPP-14), the grease pit (Site CPP-44) near Building CPP-1619, Site CPP-55 near temporary Building TB-1, and the percolation ponds (Site CPP-67) that are situated south of the ICPP fence. Figure 6 shows the location of the Group 3 sites. These sites generally consist of soil contamination that resulted from inadvertent spills and leaks of radioactive waste, decontamination solutions, spent fuel storage water, storage of radionuclide-contaminated equipment, and other plant-generated wastewaters. In addition, Site CPP-92 consists of about 640 boxes of radionuclide-contaminated soils that were generated as a result of a variety of ICPP activities.

Investigations conducted at these sites have determined the extent of soil contamination. Based on the results of drilling and sampling, the contamination generally occurs in the upper few feet of the soils, however, some sites, CPP-36 and CPP-91, have contamination that extends to the surface soil/basalt interface: a depth of about 40 ft. The results of the remedial investigation (RI) indicate that the principal threat posed by these sites is external exposure to radionuclides. Because of the generally small area and contaminant mass of most of these sites, the quantities of COCs present are not believed to pose a significant threat to groundwater. The COCs at these sites include both radionuclide and nonradionuclide contaminants.

Perched Water (Group 4)

COCs at Group 4 Site

Iodine-129
Strontium-90
Neptunium-237
Plutonium-Total
Uranium-235
Mercury

Perched water occurs at depths ranging between 100 and 420 ft in the basalts and the sedimentary interbeds beneath the ICPP. The perched water results from local recharge of precipitation infiltration, the Big Lost River, the ICPP percolation ponds, the sewage treatment ponds, lawn irrigation, and other miscellaneous ICPP water sources. Perched water flow is primarily vertical and ultimately recharges the Snake River Plain Aquifer. The perched water has been contaminated by downward transport of contaminants, primarily radionuclides (Sr-90 and tritium), from the overlying surface soils, and from two instances in which the ICPP injection well collapsed and service wastewater was released to the perched zones. Perched water (CPP-83) consists of water above the regional aquifer.

Contamination may be locally present in the perched water, but is generally not available for consumption because a water supply well installed in the perched water is not capable of sustaining a pumping rate needed for future domestic water supplies. Furthermore, after the ICPP is closed, the absence of man-made recharge will eliminate most of the perched water. As such, the perched water does not pose a direct human health threat, but may impact aquifer groundwater quality. The perched water is a contaminant transport pathway between contaminated surface soils and the Snake River Plain Aquifer. Contaminants already in the perched water are a source of aquifer contamination. A response action is necessary to minimize or eliminate the transport of contaminants along this path.

Snake River Plain Aquifer (Group 5)

The Snake River Plain Aquifer underlies the Eastern Snake River Plain and has been designated as a sole source aquifer for the region. The basalts and sedimentary interbeds underlying the ICPP, where saturated, form the Snake River Plain Aquifer. The aquifer lies at a depth of about 450 ft beneath the site. Regional groundwater flow is southwest at average estimated velocities of 5 ft/day. Average groundwater flow velocity at the ICPP is estimated at 10 ft/day due to local hydraulic conditions. Hydraulic characteristics of the aquifer differ considerably from place to place depending on the saturated thickness and the characteristics of the basalts and sedimentary interbeds.

COCs at Group 5 Site

Prior to 2095:
- Tritium (H-3)
- Strontium-90
- Iodine-129
- Neptunium-237
- Chromium
- Mercury

After 2095:
- Strontium-90
- Iodine-129
- Neptunium-237
- Plutonium
- Mercury

Groundwater present in the Snake River Plain Aquifer has been contaminated by past ICPP operational waste disposal activities. Release site CPP-23 (OU 3-02) consists of the ICPP injection well, which was the primary source of contamination to the Snake River Plain Aquifer. Radionuclides (tritium, Sr-90, and I-129) and mercury were introduced into the aquifer primarily through the ICPP injection well that was installed in 1952 to dispose of plant wastewater. In 1984, the well was removed from routine service and wastewater was disposed in the percolation ponds. The well was used for emergency purposes until 1989 when the well was permanently sealed.

The primary contaminants in the wastewater were radionuclides. Tritium was the most common radionuclide released to the aquifer, which comprised about 96% of the contaminant activity. The injected wastewater also contained other (nonradioactive) chemicals at concentrations below federal and state groundwater quality standards, except for mercury, which is estimated to exceed groundwater quality standards in the immediate vicinity of the former injection well.

Subsequent contaminant migration has produced a large contaminant plume in the aquifer with relatively low concentrations of tritium, Sr-90, and I-129, which occurs beneath and several miles south of the ICPP. Short-lived (<30 year half-life) radionuclides, such as tritium and Sr-90, do not pose a long-term risk. However, I-129 has a very long half-life and will persist in the aquifer for a long time at concentrations exceeding ***maximum contaminant levels (MCLs)*** (see Figure 7).

Maximum contaminant levels (MCLs)—a risk-based maximum allowable contaminant level in water set by the authorized resource managing body.

Leaching and transport of Tank Farm soil contaminants poses a future risk to the aquifer from Sr-90 and other contaminants. An evaluation of these risks and possible remedial actions is the focus of the separate OU 3-14 RI/FS. The principal human health and environmental threat posed by the contaminated aquifer is ingestion. Based on the groundwater modeling, the contaminant plume is not expected to migrate beyond the INEEL boundary at concentrations exceeding MCLs.

Buried Gas Cylinders (Group 6)

COC at Group 6 Sites

Fluoride

Sites CPP-84 and CPP-94 comprise the buried gas cylinders group. Site CPP-84 is located outside the ICPP fence line, east of Lincoln Boulevard and south of the Big Lost River (Figure 8). The site consists of a trench where compressed gas cylinders were previously disposed. The cylinders at the burial site originated from the ICPP and contain gases used for construction. The exact number and contents of the discarded cylinders is not known, but it is believed that 40 to 100 cylinders were disposed at the site. The gases in the cylinders include acetylene, compressed air, argon, carbon dioxide, helium, nitrogen, and oxygen. These gases do not pose a human health risk, but are considered an acute safety hazard. Ruptures of the cylinders could lead to personal injury, fire, or explosion.

Site CPP-94 includes an area about 1.5 mi northeast of the ICPP along the south side of a dirt security road. Four exposed gas cylinders have been observed at the site and are believed to contain hydrofluoric acid. The safety hazards associated with CPP-94 are similar to those at site CPP-84. The potential for cylinder over-pressurization and bursting is considered to be the most serious hazard at CPP-94. Hydrofluoric acid is very corrosive, reacts violently with moisture, and can generate explosive concentrations of hydrogen gas. Fluoride, a chemical residual of hydrofluoric acid reactions, is a potential health and ecological hazard.

SFE-20 Hot Waste Tank System (Group 7)

COCs at Group 7 Site

- Cesium-137
- Cesium-134
- Cobalt-60
- Strontium-90
- Isotopes of Europium
- Isotopes of Plutonium
- Uranium

The SFE-20 hot waste tank system is located within Site CPP-69 and consists of an abandoned radioactive liquid waste storage tank containing about 400 gal of liquid and about 55 gal of sludge. The tank was removed from service in 1977 (Figure 8). The tank system consists of the tank contents, tank, and associated structures located east of Building CPP-603. The top of the tank vault is located about 10 ft below grade. The SFE-20 hot waste tank system was constructed in 1957 to collect liquid radioactive wastes from the south basin area of Building CPP-603 and the Fuel Receiving and Storage Facility. In 1976, the SFE-20 tank system was taken out of service and the inlet pipe was disconnected and capped. The pump was also removed from the pump pit and the connections capped. A preliminary investigation conducted in 1984 indicated that the tank liquid and sludge contain elevated levels of Cs-137, Cs-134, Co-60, Sr-90, and isotopes of europium, plutonium, and uranium. Previous spills within the tank vault and pump pit contained similar contaminants.

Evaluation of Site Risks

A baseline risk assessment (BRA) was conducted as part of the RI to evaluate future potential risks to human health and the environment associated with the contaminants found at the ICPP. Data obtained during the RI were used along with computer modeling to conduct the BRA. The computer simulations used estimates and measured values of contaminant source terms to predict the potential risk posed by a site.

Human Health Risk Assessment

Hypothetical future workers or residents—people who are assumed to work or live at the site in the future.

The human health risk assessment predicted carcinogenic risks and noncarcinogenic health effects. Three exposure scenarios were used to evaluate human health risks to current workers and ***hypothetical future workers or residents*** that could potentially work or reside at the site in 2095 and beyond. The human health risk assessment consisted of two steps: (1) a site and contaminant screening that identified COCs at the release sites and (2) an exposure route analysis for each COC. The risk assessment included an evaluation of human health risk associated with (a) exposure to contaminants through soil ingestion, (b) external radiation exposure, (c) ingestion of homegrown produce, (d) inhalation exposure, and (e) ingestion of groundwater. The predicted soil and groundwater pathway risks were used to assess the threat posed by the release sites to human receptors. Cumulative site risks were estimated by adding the predicted soil and groundwater risk values. This risk assessment approach was used to provide conservative risk estimates, which probably overestimate the actual site risks.

From now until the year 2095, it is assumed that the ICPP will remain a restricted INEEL industrial facility under federal government management and control. The ICPP is projected to remain in operation until about 2045. Discussions with area planners, concerned citizens, and other stakeholders indicate that the earliest public access or use of ICPP real estate is projected to be 2095, 100 years beyond the initial planning event. Risks to human health will be controlled through the use of institutional controls (i.e., fencing, signs, and other access restrictions). Risks to the current worker and the future worker (beyond 2095), without reliance on institutional control, were also estimated in the BRA. Risks to current and future workers will be controlled by continuing the health and safety and radiological controls practices currently used at the site.

Under the CERCLA program, cleanup decisions are generally made at carcinogenic ***excess risk*** levels greater than one in 10,000. For risk levels between one in 10,000 and one in 1,000,000, the agencies make a risk management decision regarding the appropriate level of remedial action required. Excess risks from single contaminants are generally managed to be less than one in 1,000,000. Where multiple contaminants are present, the total excess risk may not exceed one in 10,000. There are 40 sites at the ICPP with future resident risk levels that may require remedial action. Table 1 lists the ***risk ratios*** determined in the BRA for the seven release site groups.

Excess risk—the probability of an individual developing cancer as a result of exposure to site contaminants, over and above the individuals natural risk of developing cancer.

Risk ratios—the number of events expected in a specific group size (i.e., 1 in 100 chances of occurrence or 1 chance in 100 [1/100]).

Ecological Risk Assessment

In addition to investigating risks to human health, other risks were also examined through an ***ecological risk assessment (ERA)***. The purpose of the ERA was to identify potential COC at release sites that could contribute an unacceptable risk to nonhuman receptors. The ecological receptor exposure assessment consists of estimating the magnitude, frequency, duration, and exposure routes between the environment and the ecological receptors that contact the contaminants. This exposure is then evaluated using effects assessment to determine potential adverse effects to ecological receptors.

Ecological risk assessment (ERA)—an assessment of the potential risks to ecological receptors (i.e., plants and animals).

In the ERA, release sites whose maximum contaminant concentrations were less than the INEEL background or whose maximum contaminant concentrations were less than ecologically based screening levels (EBSLs) were eliminated. Release sites with exposure point concentrations greater than 10 times the INEEL background constituent concentrations were considered to pose a potential risk to ecological receptors and were retained for analysis in the FS.

Of the 95 release sites assessed, 27 of the sites were shown to pose a potential risk to ecological receptors as well as to human health. Four additional sites, CPP-14 (the Imhoff Tank), CPP-44, -55, and -66, solely pose an ecological risk from contaminants that have exposure point concentrations exceeding 10 times the INEEL background concentrations. The COCs and their maximum concentration at these sites are listed in Table 2. The remaining 64 sites do not pose a risk to ecological receptors. For sites that pose a potential threat to both human and ecological receptors, it is assumed that alternatives developed to address human health risks will also adequately address

Table 1. Human health baseline risk assessment summary for WAG 3 sites of concern (see Table 2-1 of the Feasibility Study for additional details).

Group 1— ICPP Tank Farm

Key COC	Cs-137*	Sr-90**	U-235
Exposure Scenario	**************************Group Site Risk*	*********************************	
Current Worker	6 in 10	5 in 10,000	5 in 10,000
Future Worker (in 2095)	6 in 100	5 in 100,000	5 in 10,000
Future Resident (in 2095)	3 in 10	2 in 10,000	2 in 1,000

* Cs-137 contributes to risk only via direct exposure.

** Sr-90 contributes to risk via groundwater, soil direct exposure, and ingestion.

Group 2—Soils Under Buildings and Structures

No surface risks due to incomplete exposure pathway while buildings are in place. Release sites pose a potential risk to groundwater via soil contaminant leaching and transport. Risks to groundwater are presented under Group 5. Key COCs and their concentrations are assumed to be the same as for Group 3 soils.

Group 3—Other Surface Soils

Key COC	Cs-137	Eu-152	Eu-154
Exposure Scenario	*************************Group Site Risk*	*********************************	
Current Worker	5 in 100	2 in 1,000	2 in 1,000
Future Worker (in 2095)	5 in 1,000	1 in 100,000	8 in 10,000,000
Future Resident (in 2095)	2 in 100	6 in 100,000	4 in 1,000,000

Group 4—Perched Water

Key COC Total Pu Sr-90

No risk because perched water is not capable of sustaining a pumping rate needed for future domestic water supplies; therefore, it is not a source of potable water. However, perched water is a source of contamination for the Snake River Plain Aquifer.

Group 5 - Snake River Plain Aquifer

Key COC	Am-241	Cs-137	I-129	Np-237	Sr-90
MCL (pCi/L)	15	200	1	15	8
*****************Future Residential Scenario in 2095 and Beyond*****************************					
Concentration (pCi/L)	0.6	5.2	4.7	1.2	8.1
Predicted Risk	4 in 2,000,000	4 in 1,000,000	2 in 100,000	8 in 1,000,000	9 in 1,000,000
Total Groundwater Risk	5 in 100,000				

Group 6—Buried Gas Cylinders

Risks were not calculated for these sites. These sites present a safety risk and threaten future release of contaminants.

Group 7—SFE-20 Hot Waste Tank System

Risks were not calculated because no exposure pathways currently exist. The tank is housed with a concrete secondary containment vault. May pose a future risk to groundwater if a release occurs. High concentrations of radionuclides exist in the tank sludge. The COCs include plutonium and uranium.

Table 2. Summary of sites that pose solely an ecological risk.

Site	Contaminant of Concern	Maximum Concentration (ppm)	10 x Background (ppm)
CPP-14	Mercury	1.2	0.5
CPP-44	Chromium III	1,540	330
CPP-44	Chromium VI	1,540	NA
CPP-44	Lead	281	170
CPP-44	Mercury	5.0	0.5
CPP-55	Chromium VI	65.0	NA
CPP-66	Boron	310	230

ppm—parts per million (e.g., 5 ppm = 5/1,000,000).

ecological concerns. Alternatives for sites CPP-14, -44, and -55, which solely pose an ecological risk, are developed under the Other Surface Soils Sites group. Final closure of site CPP-66 will be conducted under the Solid Waste Management Landfill Closure Program and will be designed to address the ecological risks identified for this site.

Remedial Action objectives

To achieve a reasonable degree of protection at these sites, the agencies have developed a range of potential remedial alternatives for each group of sites and compared the alternatives against RAOs selected to protect human health and the environment. Remedial action objectives are specific risk criteria that take into consideration the assumed future land uses at the ICPP, which include industrial use until the year 2095 and potential residential land use after that time. Although it is possible that residences may be constructed within the ICPP after 2095, installation of water supply wells that may be drilled within the area of the current ICPP fence is prohibited.

Selected remedial alternatives must protect human health and the environment and meet regulatory requirements. RAOs guide the choice of alternatives for remedial action. The RAOs proposed for WAG 3 have been simplified by categorizing by the media (i.e., soils or groundwater) of concern. The applicable RAOs for a particular site or group of sites depends on the specific media impacted.

Remedial action objectives were developed for the time period prior to 2095, the institutional control period, and in 2095 and beyond for the hypothetical residential-use scenario. For sites posing a potential threat to human and ecological receptors, it is assumed that the human health RAO will adequately address ecological concerns. The human health RAOs proposed for OU 3-13 include:

All Environmental Media

- For all pathways and exposure routes, the cumulative carcinogenic risk will not exceed 2 in 10,000 (1 in 10,000 for soil at each release site boundary and 1 in 10,000 for groundwater beyond the south ICPP fenceline).
- For all pathways and exposure routes, the cumulative noncarcinogenic risk will not exceed a total ***hazard index (HI)*** of 2 (a HI of 1 for soil exposure pathways and a HI of 1 for aquifer groundwater beyond the south ICPP fence).

Snake River Plain Aquifer

- Prior to 2095: Prevent on-Site workers from ingesting water from the Snake River Plain Aquifer that exceed MCLs under the ***Idaho groundwater quality standards.***
- After 2095: Ensure the water in the Snake River Plain Aquifer outside the ICPP fenceline meets the MCLs under the Idaho groundwater quality standards.

(The groundwater COCs are listed in the sidebar on Page 15.)

Perched Water and Surface soils

- Prevent migration of radionuclides from perched water or surface soils in concentrations that would cause the groundwater south of the ICPP fence beyond 2095 to exceed the Idaho groundwater quality standards or the federal MCLs.

Hazard index (HI)—the sum of more than one hazard quotient where the EPA goal is a value not to exceed 1. A hazard quotient is the ratio of a single substance exposure level, over a given time period, to a reference exposure level at which no adverse effects are likely to occur.

Idaho groundwater quality standards—water quality standards established to protect groundwater quality under the State of Idaho Groundwater Rule.

CERCLA Evaluation Criteria

Threshold Criteria:

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.
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:

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.
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 COC, including how treatment is used to address the principal threats posed by the site.
Short-Term Effectiveness addresses any adverse impacts on human health or the environment that may be posed during the construction and implementation period and the period of time needed to achieve cleanup goals.
Implementability is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.
Cost includes estimated capital and operation and maintenance costs, expressed as net present-worth costs.

Modifying Criteria:

State Acceptance reflects aspects of the preferred alternatives that the state favors or objects to and any specific comments regarding state ARARs or the proposed use of waivers.

Community Acceptance summarizes the public's general response to the alternatives described in the proposed plan and in the remedial investigation/ feasibility study (RI/FS) based on public comments received.

Surface Soils

- Prevent exposure to contaminated surface soils such that a risk of 1 in 10,000 is not exceeded. The risk-based concentrations will be met at each release site. This RAO applies to both future residents and or future on-Site workers.
- Prevent exposure to noncarcinogenic COCs above a HI of 1 for all surface soil exposure pathways to a future resident and or future on-Site workers from contaminated surface soils at the boundary of each release site.

Maintaining current health and safety practices and radiological engineering controls at the site will minimize exposure of current workers to surface soil COCs.

The ecological RAOs proposed for OU 3-13 includes:

- Prevent ecological receptor exposure to surface soil COCs with a concentration greater than 10 times background concentrations, which may cause adverse effects to resident populations of flora and fauna, as determined by the ERA.

Alternative Development Evaluation and Recommendation

A range of cleanup alternatives were developed and evaluated for each of the release site groups. The specific alternatives were developed from a list of representative remedial technologies for the purposes of technical evaluation and cost estimating. The actual technologies used will be similar to those described below but may be modified during remedial design. For all soils groups except Group 6, Buried Gas Cylinders, and Group 7, SFE-20 Tank, each developed alternative compounds the previous one. For example, in each group, Alternative 2 includes all the elements of Alternative 1, and Alternative 3 includes all the elements of Alternative 2.

CERCLA typically requires evaluation of a "no action" alternative as a baseline for comparison to the other alternatives. Because the ICPP will continue operations as a restricted access industrial facility for the foreseeable future, a 100-year industrial scenario was used for detailed and comparative analysis. Alternative 1, Existing Institutional Controls, for each release site group was therefore considered the "no action" alternative and was used to compare against the other alternatives.

The alternatives developed for each of the release site groups and the unique sites were evaluated against the nine CERCLA evaluation criteria. A glossary of these criteria is provided in the sidebar on this page. The CERCLA evaluation criteria are grouped into three categories termed threshold, balancing, and modifying criteria. All alternatives must meet the threshold criteria. Once the threshold criteria have been met, the alternatives are measured against the balancing criteria. Alternatives are not further evaluated if they do not meet the threshold criteria. Finally, the alternatives are evaluated for state and community acceptance to determine whether they meet any modifying criteria. The final review of modifying criteria does not happen until the state and public have commented on the Proposed Plan. The ROD addresses compliance with these modifying criteria, so they are not discussed in this plan.

Tank Farm Soils (Group 1)

After review of the OU 3-13 RI/FS, the agencies determined that additional information was required to make a final risk management decision for this group of sites. The agencies have postponed a final risk management decision on the Tank Farm because of the uncertainty concerning contaminant extent, site risks, and the need to integrate cleanup actions with the ***High-Level Waste (HLW) and Facility Disposition Environmental Impact Statement (EIS)***. Additional site characterization and risk analysis will be performed at the Tank Farm in a separate RI/FS that is designated as OU 3-14. Remedial alternatives will be developed in the new RI/FS using these existing and newly developed data and presented to the public in a separate Proposed Plan.

An ***interim action*** is proposed for the Tank Farm while the new RI/FS is conducted. The interim action will be performed to minimize contaminant exposures and to limit further impacts to soil and groundwater until a final remedy is implemented. A final risk management decision is anticipated in about 2004. The interim action selected will be consistent with the final remedy. Interim action alternatives were developed and evaluated for the Tank Farm in the FS supplement. The implemented interim action will be designed to prevent exposure to contaminants present at the site and to minimize moisture that may infiltrate through the Tank Farm soils to the perched water, which may cause contaminants to mobilize. Interim actions are justified because the facility will be in operation until 2015, and Resource Conservation and Recovery Act (RCRA) closure of the tank systems is not expected to be complete until 2018. Until the facility is closed, surface water controls remain necessary. This alternative is consistent with the final Tank Farm Soils remedy and will likely be a component of the final remedy.

High Level Waste (HLW) and Facility Disposition Environmental Impact Statement (EIS)—a study designed to evaluate potential alternatives to disposition high level waste (i.e., highly radioactive waste) stored in the Tank Farm and elsewhere at the INEEL. In addition, this study will evaluate potential alternatives to disposition facility associated with HLW.

Interim action—a short-term remedy implemented before the final remedy.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 consists of the ***existing institutional controls*** currently implemented at the site. No active remediation will be performed at the site to alter the existing conditions. The existing institutional controls include site access restrictions, environmental monitoring, and maintenance for a period of 6 years or until a final risk management decision, made by the agencies, is implemented.

Existing institutional controls—access restrictions, fencing, security, and environmental monitoring.

Alternative 2—Institutional Controls. Alternative 2 consists of the existing institutional controls described for Alternative 1 and ***additional institutional controls***. Fifteen new monitoring wells are proposed to enhance the existing groundwater monitoring capabilities during the interim action period and verify hydraulic parameters and water quality results.

Additional institutional controls—additional monitoring, warning signs, surface and subsurface markers, and land use restrictions.

Alternative 3—Institutional Controls with Surface Water Control. Alternative 3 includes the existing and additional institutional controls described for Alternative 2 and an interim remedy to control surface water runon and infiltration at the Tank Farm. The initial phased remedy includes surface grading and exterior building drainage improvements to direct water away from the contaminated areas so that moisture infiltration is minimized and contaminants are not mobilized. This proposed interim action is expected to reduce infiltration by 80%, thereby reducing contaminant migration rate to the perched water by a factor of five.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—Alternative 3 provides the most overall protection of human health and the environment. All three alternatives limit human and ecological receptor exposure to contaminants by maintaining the existing institutional controls, which are a common component of all of the alternatives. Alternatives 1 and 2 do not provide any direct action to limit leaching and transport of contaminants from the surface soils to the perched water. Alternative 3 includes initial phased remedies involving engineering controls to limit surface water infiltration into contaminated soils and leaching and transport of contaminants to perched water. Implementation of surface water controls to limit future contaminant leaching to the perched water will reduce the risk to the Snake River Plain Aquifer. All of the alternatives will provide perched water monitoring to determine if additional degradation of perched water is occurring. Table 3 summarizes the comparative analysis of the Tank Farm interim action alternatives.

Applicable or relevant and appropriate requirements—Applicable requirements are requirements mandated by federal or state law that are specific to a substance, pollutant, contaminant, action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are requirements 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.

To be considered (TBC)—requirements that are standards or requirements not promulgated by federal or state law but are otherwise appropriate for the CERCLA site such that their use is well suited to that particular site.

Compliance with ARARs—All of the proposed alternatives comply with the ***applicable or relevant and appropriate requirements (ARARs)*** and ***to be considered (TBCs)*** during the interim action period, which ends in 2005. These alternatives would also comply with the ARARs beyond the interim action period as long as the existing institutional controls are maintained. ARARs concerning monitoring well installation and other construction activities will be met using engineering controls, health and safety practices, and radiological control methods. The principal ARAR evaluated was IDAPA 16.01.02.299, the state of Idaho Groundwater Quality Standards for the protection of drinking waters. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5.

Long-Term Effectiveness and Permanence—None of the proposed alternatives provide long-term effectiveness or permanence. As interim measures, the period of performance is assumed to be about 6 years (until 2005) or until the final remedy is selected and implemented. The proposed alternatives will minimize human and ecological receptor exposure to contaminants and limit any further groundwater degradation during the interim action period. Alternative 3 will limit further perched water degradation during the interim action period. It is presumed that the final Tank Farm remedy will provide an effective and permanent long-term solution that mitigates human and environmental exposure risks and limits further groundwater degradation.

Reduction of Toxicity, Mobility, or Volume Through Treatment—None of the alternatives provide a reduction of toxicity, mobility, or volume through treatment since treatment will not be implemented during the interim action period. Some reduction in contaminant mass, and thus volume, is achieved indirectly through natural radioactive decay of short-lived radionuclides, such as Cs-137 and Sr-90; however, the contaminant toxicity will remain the same. Reduction in contaminant mobility will be achieved by implementing the surface water controls in Alternative 3 to limit leaching and transport of soil contaminants.

Short-Term Effectiveness—All of the alternatives can be implemented without significant additional risk to the community or workers. The primary risk to the community and workers from these alternatives involves fugitive dust and toxic substance emissions, which will be controlled with dust suppressants and engineering controls. Alternatives 2 and 3 pose a very minor risk to workers from direct exposure to radiation and personal injury during construction. Sampling of the monitoring wells, proposed in all alternatives, poses very minor risks to personnel. Alternative 3 poses similar risks to workers while implementing the surface water controls. Personal injury and radiation exposure will be minimized through radiological engineering controls and safe work practices to maintain exposures as low as reasonably achievable (ALARA).

Implementability—All of the proposed alternatives are technically and administratively implementable. None of the alternatives require any special materials, equipment, or personnel that are not readily available at the site. Each of the alternatives can be easily implemented using existing controls along with standard sampling, monitoring, and construction methods that are currently used at the site. Alternative 1 is the easiest to implement since it involves continuation of the existing activities at the Tank Farm and the ICPP. Alternatives 2 and 3 involve additional monitoring well construction and implementation of surface water controls, which are also readily implemented by personnel at the site. Minor implementability concerns are posed by the underground utilities in and around the Tank Farm while implementing subsurface activities. These risks will be minimized through coordination with operating personnel familiar with the Tank Farm and the adjoining facilities.

Cost—Alternative 1 is the least costly of the proposed Tank Farm interim action alternatives. Alternatives 2 and 3 both have increased capital and operating and maintenance (O&M) costs associated with installing monitoring well, monitoring perched water, and implementing surface water controls. Alternative 3 is the most expensive alternative evaluated because it includes the largest quantity of capital improvements. A summary of the capital and O&M costs are shown in the sidebar. The costs for the interim action alternatives are based on an interim action period that ends in 2005.

Table 3. Summary of comparative analyses for the Tank Farm Soils interim action.

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	Y*	Y*	Y
Compliance with ARARs	Y	Y	Y
Long-Term Effectiveness	5	5	3
Reduction of Toxicity, Mobility, or Volume	N	N	N
Short-Term Effectiveness	3	3	3
Implementability	1	3	3
Net Present Value Cost	**$3.4M**	**$10.0M**	**$15.1M**

* = May not be protective of future groundwater resources.
5 = least satisfies criterion; 1= best satisfies criterion; NA = not applicable.

Preferred Alternative

The preferred alternative for the Tank Farm Soils Interim Action is *Alternative 3, Institutional Controls with Surface Water Control.* This alternative will provide existing institutional controls to limit exposures to contaminated soils and engineering controls to reduce surface water runon/runoff at the release sites. Reduction of surface water infiltration into contaminated soils will limit leaching and transport of soil

Tank Farm Soils Interim Action

Alternative 1	
NPV	
Capital	$1.4M
O&M	$2.0M
Total	$3.4M
Total (FY 97$)	$3.8M
Alternative 2	
NPV	
Capital	$6.5M
O&M	$3.5M
Total	$10.0 M
Total (FY 97$)	$10.8 M
Alternative 3	
NPV	
Capital	$11.4M
O&M	$3.7M
Total	$15.1M
Total (FY 97$)	$16.3M

contaminants to the perched water and minimally reduce available water in the perched zone. Groundwater monitoring will be performed during the interim action period to verify contaminant concentrations in perched water and the Snake River Plain Aquifer beneath the site and to evaluate potential changes in water quality if they occur. Of the three alternatives evaluated, Alternative 3 will provide an interim solution that reduces the potential for further soil contaminant leaching and transport to the perched water, reduce the available water in the perched zone beneath the Tank Farm, and potentially minimize further water quality impacts. The agencies believe this interim action is protective of human health and the environment while the Tank Farm RI/FS is performed. It is compliant with ARARs, cost effective, consistent with the final Tank Farm remedy, and can be readily integrated with the HLW EIS currently being conducted.

Soils Under Buildings and Structures (Group 2)

Soils Under Buildings and Structures are sites for which contaminant source releases are not well defined. Contaminated soil release sites are assumed to be present as a result of accidental past releases during plant operations. The releases occurred under buildings making characterization difficult. The principal threat posed by these sites is to groundwater since the buildings or structures cover the sites and limit the potential for external exposure. Although these potential releases to the environment are recognized, the release sites are not readily accessible and may remain covered by the facilities, since the buildings or structures may be closed in place as operations cease. The ***decontamination and dismantlement (D&D)*** program is determining the fate of individual buildings. Buildings may remain in place upon closure, and evaluations will confirm that the presence of the existing structures over these sites provides the functional equivalent of an engineered barrier. Three alternatives were evaluated for the Soils Under Buildings and Structures group to minimize the threat of contaminant exposure or mobilization.

Decontamination and dismantlement (D&D)— occurs at the end of the useful life of a nuclear facility and involves the removal of sufficient radioactive or hazardous materials from the facility equipment and structures to allow the restricted or unrestricted release of the facility. For unrestricted release, these activities reduce the risk to human health and the environment to negligible levels.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, environmental monitoring, and maintenance. These controls will remain in place until 2095.

Alternative 2—Containment. Alternative 2 includes the existing institutional controls described for Alternative 1, additional institutional controls, and containment with an engineered barrier. The additional institutional controls may include land or regulatory restrictions, such as land use restrictions to prevent inadvertent exposure to contaminants. The proposed engineered barrier is comprised of natural earthen materials that are designed to isolate the contaminants and minimize water infiltration and leaching and transport of contaminants for up to 1,000 years. The final cover design will meet ARARs and is subject to the FFA/CO review process.

Alternative 3—Removal and On-Site Disposal. Alternative 3 was developed in the event that contaminated soils present beneath the buildings or structures become exposed following D&D. Alternative 3 includes the existing and additional institutional controls described for Alternative 2, and removal and on-Site disposal of contaminated soils exposed during D&D. The exposed contaminated soils would be excavated and disposed in the proposed INEEL-wide ICDF.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—All of the proposed alternatives provide overall protection of human health and the environment during the institutional control period, which ends in 2095. Beyond 2095, only Alternatives 2 and 3 provide long-term protection and satisfy the applicable RAOs. Current workers will be protected by the existing institutional controls proposed in each alternative. Alternative 2 provides long-term protection of human health and the environment by isolating the contaminants with an engineered barrier designed to last for at least 1,000 years and implementing additional institutional controls. The barrier and the additional institutional controls prevent inadvertent exposures to humans or ecological receptors by limiting contaminant accessibility through engineering controls and land use restrictions limiting land or groundwater use. The presence of the existing structures provides the functional equivalent of an engineered barrier and will minimize exposures until D&D is completed. Alternative 3 provides the most overall protection of human health and the environment by removing contaminated soils exposed during D&D and disposing them in the proposed INEEL-wide ICDF. Removal of the soils will prevent exposure of humans or ecological receptors to soil contaminants. Table 4 summarizes the comparative analysis of the Soils Under Buildings and Structures alternatives.

Compliance with ARARs—All of the alternatives meet the ARARs and TBCs during the institutional control period, which ends in 2095. Beyond 2095, only Alternatives 2 and 3 satisfy ARARs. Alternative 2 meets the ARARs using institutional controls and an engineered barrier designed for 1,000 years of protection. Alternative 3 satisfies ARARs through the use of engineering controls while removing the contaminated soils and disposing of the contaminated materials in an engineered disposal facility designed to provide long-term protection of human health and the environment. The principle ARARs evaluated were state of Idaho Groundwater Quality Standards, Idaho Fugitive Dust Emission rules, and hazardous waste landfill closure requirements. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5

Long-Term Effectiveness and Permanence—Alternative 1 does not provide any long-term effectiveness or permanence, because the existing institutional controls will end in 2095, and no exposure controls will remain in place. Alternative 2 provides reliable long-term effectiveness and permanence by reducing human or ecological receptor exposure to contaminants beyond 2095. The proposed engineered barrier is designed to provide long-term isolation of these release sites for up to 1,000 years, during which time the residual risk will decrease by natural radioactive decay. Alternative 3 will provide the most long-term effectiveness by removing the contaminated soils exposed during D&D and disposing of them in the proposed INEEL-wide ICDF that is designed for long-term isolation of radioactive materials. The residual risk posed by soils disposed in this engineered disposal facility will naturally decrease by radioactive decay of the short-lived radionuclides.

Reduction of Toxicity, Mobility, or Volume Through Treatment—None of the alternatives reduce the toxicity, mobility, or volume of contaminants through treatment, as treatment is not included in any of the alternatives. Contaminants are indirectly reduced over time by natural radioactive decay under each alternative. The mobility of contaminants will be reduced by the construction of an engineered barrier that will minimize water infiltration and leaching and transport of soil contaminants. Contaminant bioavailability to human and ecological receptors is also reduced by the engineered barrier. Removal and disposal of the soil contaminants in the proposed INEEL-wide ICDF will also indirectly reduce the contaminant mobility by isolating the wastes in an engineered disposal facility designed to provide long-term isolation of contaminants.

Short-Term Effectiveness—Alternative 1 can be implemented without any additional risks to the community or workers; however, soil contaminants will continue to be accessible to ecological receptors under this alternative. Alternatives 2 and 3 can be implemented without any additional risks to the community, workers, or the environment. Risks to workers and the environment will be increased slightly during barrier construction, or soil excavation, because of worker exposure to contaminated soils, fugitive dust emissions to the environment, and the potential for personal injury accidents. Engineering controls will be used during barrier construction, or soil excavation, to minimize contaminant exposures or releases. Safe work practices will be used to minimize personal injuries.

Implementability—Alternatives 1 and 2 are technically and administratively feasible and can be easily implemented. Existing institutional controls proposed in Alternative 1 are currently implemented at the site and are easily continued. The additional institutional controls and engineered barrier provided in Alternative 2 have been used at other Superfund sites with similar contaminants and pose no special legal, engineering, or construction concerns. Engineered barrier construction is similar to other types of earthwork, such as highway construction, and requires no special personnel, equipment, or materials. The only significant implementability issue concerns the timing of barrier construction. The barrier cannot be constructed until adjacent buildings or structures have undergone D&D, which may not occur for several decades in the future. Alternative 3 also is readily implemented, but only if the buildings are removed completely during D&D. The timing for implementation of Alternative 3 is also dependent on D&D activities that are projected to extend over the next several decades. In addition, Alternative 3 also depends on the construction of an INEEL-wide ICDF.

Cost—Alternatives 1 and 3 are the least costly of the alternatives evaluated. Alternative 2 is the most expensive alternative because of the capital costs involved in constructing the engineered barriers. Alternative 3 has the least O&M costs because of the elimination of environmental monitoring costs after the soils are excavated. A summary of the capital and O&M costs is shown in the sidebar. The O&M costs are based on an institutional control period through the year 2095.

Table 4. Summary of comparative analyses for the Soils Under Buildings and Structures (Group 2).

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	Y*	Y	Y
Compliance with ARARs	Y*	Y	Y
Long-Term Effectiveness	5	3	1
Reduction of Toxicity, Mobility, or Volume	N	N	N
Short-Term Effectiveness	5	3	5
Implementability	1	1	5
Net Present Value Cost	**$6.4M**	**$9.2M**	**$8.3M**[a]

* = Relies on presence of buildings and their effectiveness as a functional cap.

a. Cost does not include the pro-rata share for construction and operation of the ICDF.

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable.

Soils Under Buildings and Structures

Alternative 1	
NPV	
Capital	$2.7M
O&M	$3.7M
Total	$6.4 M
Total (FY 97$)	$13.7M
Alternative 2	
NPV	
Capital	$5.1M
O&M	$4.1M
Total	$9.2M
Total (FY97$)	$17.9M
Alternative 3	
NPV	
Capital	$6.1M
O&M	$2.2M
Total	$8.3M
Total (FY 97$)	$13.0M

Preferred Alternative

The preferred alternative for the Soils Under Buildings and Structures is *Alternative 2, Institutional Controls with Containment, or* if D&D programs remove the structures covering these sites, *Alternative 3, Removal and On-Site Disposal.* Alternative 2 consists of existing and additional institutional controls and containment of the release sites using an engineered barrier. The impacted soils will be covered with natural earthen materials to isolate the contaminated soils and prevent exposure to humans or the environment. The barrier system will be designed to prevent future exposure for up to 1,000 years, which will allow for natural radioactive decay to reduce contaminant concentrations to levels that are not a risk to human health or the environment. The barrier will also be designed to minimize moisture infiltration into the contaminated soils and mobilization of contaminants. If the D&D program removes the bottom floors or foundations of buildings or if evaluations indicate that the residual structure is not an adequate barrier, contaminated soils will be removed and disposed as described in Alternative 3. The agencies believe the preferred alternative is protective of human health and the environment, compliant with ARARs, uses permanent solutions, is cost effective, and consistent with expected D&D activities.

Other Surface Soils (Group 3)

The Other Surface Soils release sites resulted from miscellaneous contaminant spills or past waste disposal activities at the ICPP. The primary threat posed by most of these release sites is external exposure to radionuclides. One site (CPP-93) contains mercury at concentrations potentially hazardous to humans. Three of the sites, CPP-14, -44, and -55, pose solely an ecological risk because of nonradionuclide contaminants, such as mercury, chromium, and lead. Five alternatives were evaluated for the Other Surface Soils release sites to address a range of potential cleanup actions that are protective of human health and the environment. The alternatives include existing and additional institutional controls, containment using an engineered barrier, removal and on-Site disposal, and removal, ex situ treatment, and off-Site disposal.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, air monitoring, and maintenance. These controls will remain in place until 2095.

Alternative 2—Institutional Controls. Alternative 2 includes the existing institutional controls described for Alternative 1 and additional institutional controls to control exposures to contaminated soils. The additional institutional controls include land and/or regulatory restrictions, such as land use restrictions, to prevent inadvertent exposure to contaminants. For the boxed soils comprising Site CPP-92, the soils will be loaded into ***SEALAND®-type containers*** after 10 years to provide additional stability and control.

SEALAND-type container— a steel container that is approximately 25 x 10 x 8 ft in size.

Alternative 3—Containment. Alternative 3 includes existing and additional institutional controls described for Alternative 2 and containment using an engineered barrier. The proposed engineered barrier is comprised of natural earth materials that is designed to isolate the contaminants, minimize water infiltration, and reduce contaminant leaching and transport for up to 1,000 years. Some of the operating facilities may interfere with barrier construction, so that final containment may not be implemented until facility D&D has concluded several decades in the future.

Alternative 4A—Removal and On-Site Disposal. Alternative 4A includes the existing institutional controls described in Alternative 1 and removal and on-Site disposal of the contaminated soils at each release site in this group. After removal of soils at individual sites, institutional controls will be terminated at each site but maintained at the location of the ICDF. Soils will be excavated to a depth of 10 ft using conventional excavation equipment. Holes will be backfilled to grade with clean fill. The estimated contaminated soil yield is 82,000 yd^3. Shielded equipment will be used as necessary to protect workers from radiation exposure. The excavated soils will be deposited in an INEEL-wide ICDF. The ICDF is expected to be constructed in the vicinity of the ICPP percolation ponds.

INEEL CERCLA Disposal Facility—To implement on-Site disposal of Waste Area Group 3 and other CERCLA-generated wastes at the INEEL, a disposal facility is proposed. The ICDF will be an engineered facility meeting RCRA Subtitle C design and construction requirements, which are the same regulations required for commercial disposal facilities.

Consisting of about six cells, south of ICPP and adjacent to the existing percolation ponds (see Figure 10), the ICDF would have a total capacity of about 510,000 yd^3 and cover about 54 acres. (Current projections of INEEL-wide CERCLA waste volumes total about 466,000 yd^3.) The proposed location lies beyond the area inundated by the Big Lost River ***100-year flood event***. Design criteria for the life for the facility's cover exceeds 1,000 years.

100-year flood event—The flood resulting from a storm yielding a flow statistically expected to occur once every 100 years.

The ICDF will accept only those wastes generated within INEEL boundaries during CERCLA actions. The OU 3-13 wastes are assumed to lie within the WAG 3 area of contamination (AOC). Waste materials originating in the OU 3-13 AOC and which are suitable for disposal are estimated to require two of the six proposed cells. Other INEEL wastes are not included within the OU 3-13 AOC. Wastes would include low-level, mixed low-level, hazardous, and limited quantities of Toxic Substances Control Act wastes. Waste acceptance criteria will be developed during the design phase of the project. Acceptance criteria will include restrictions on contaminant concentrations based on groundwater modeling results and the goal of preventing potential future risk to the Snake River Plain Aquifer.

Figure 10. INEEL CERCLA Disposal Facility, conceptual arrangement.

Alternative 4B—Removal, Treatment, and Off-Site Disposal. Alternative 4B is identical to Alternative 4A except that disposal in an off-Site facility is contemplated. About 82,000 yd^3 of contaminated soil are expected to require disposal. Soils will be selectively excavated to reduce the soil volume, packaged, and transported by truck or rail to a permitted engineered disposal facility located off-Site. Waste will be treated off-Site at the receiving facility, if necessary, to satisfy land disposal restrictions.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—Alternatives 3, 4A, and 4B provide the most overall protection of human health and the environment of the alternatives evaluated because the contaminants will either be permanently isolated or removed and disposed in an engineered disposal facility. Alternatives 1 and 2 temporarily reduce human health risks during the restricted industrial use, which ends in 2095. However, Alternatives 1 and 2 are not protective of the environment because the contaminants will continue to be accessible to ecological receptors. Alternative 3 provides less overall protection than Alternatives 4A and 4B, since the contaminants cannot be covered in place by an engineered barrier during the operating life of the ICPP. Alternatives 4A and 4B will permanently remove the contaminants from the release sites. Table 5 summarizes the comparative analysis of the Other Surface Soils Sites alternatives.

Compliance with ARARs—All of the alternatives will satisfy the ARARs, except for Alternatives 1 and 2, which will only meet the ARARs during the institutional control period, which ends in 2095. Alternatives 3, 4A, and 4B will satisfy the ARARs using engineering controls to minimize fugitive dust emissions, health, safety, and radiological practices to limit exposures to workers, long-term containment to isolate the contaminated soils, or soil excavation and disposal to eliminate exposures to humans or the environment. In addition to those ARARs evaluated for the Group 2 Soils, the hazardous waste landfill design requirements were a component of the on-Site disposal alternative evaluation. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5.

Long-Term Effectiveness and Permanence—Alternatives 1 and 2 do not provide reliable long-term effectiveness or permanence because the existing institutional controls will end in 2095. Land use restrictions limiting land and groundwater use in Alternative 2 will provide some measure of long-term protection if maintained beyond 2095, but these controls may not effectively control potential exposure to contaminants. For Alternatives 1 and 2, natural processes, such as precipitation infiltration, erosion, and biointrusion, may cause a contaminant release to the environment. Containment of contaminated soils using an engineered barrier (Alternative 3) will provide long-term effectiveness and permanence, since the proposed barrier is designed to provide isolation for at least 1,000 years, during which time the residual risk will decrease by radioactive decay. Alternatives 4A and 4B will provide the best long-term protection by excavating contaminated soils to a depth of 10 ft and disposing in either an on-Site or off-Site engineered disposal facility designed for long-term protection and contaminant isolation.

Reduction of Toxicity, Mobility, or Volume Through Treatment—Alternatives 1, 2, 3, and 4A do not reduce the toxicity, mobility, or volume through treatment as no treatment technologies are included in these alternatives. Alternative 4B may reduce the contaminant volume through treatment by sorting the radionuclide-contaminated soils by activity to reduce the overall volume of contaminated soils. Construction of an engineered barrier under Alternative 3 reduces contaminant mobility by minimizing water that moves through the contaminated soils, reducing leaching and transport of contaminants. Alternatives 4A and 4B limit contaminant mobility at the release site by excavating and disposing of contaminated soils at an engineered disposal site designed to limit contaminant releases to the environment.

Short-Term Effectiveness—Alternatives 1 and 2 can be implemented without any additional risks to the community, workers, or the environment. Implementing Alternative 1 or 2 will not increase environmental risks that presently exist at the sites. Earth moving activities associated with Alternatives 3, 4A, and 4B may generate fugitive dust emissions or cause personal injury accidents that pose minor risks to workers or the environment. These risks will be minimized using dust suppressants or other engineering controls and health, safety, and radiological practices. Transportation of contaminated soils off-Site (Alternative 4B) also poses a minor risk to communities;

however, potential exposures due to transportation accidents are assumed to be minimal.

Implementability—All of the proposed alternatives are technically and administratively feasible because they use proven remedial technologies that are readily available. Alternative 1 is readily implemented because the existing institutional controls are currently ongoing at the site and are easily continued. Alternative 2 is also easily implemented as land use restrictions limiting land and groundwater use are used routinely at Superfund sites. Construction of engineered barriers over the Other Surface Soils release sites, Alternative 3, pose several technical difficulties. Heavy equipment would be required for barrier construction and would be required to operate within an operational radioactive material processing and storage facility without damaging existing tanks, buildings, utilities, or other infrastructure. Continued operation of the ICPP would also be affected significantly due to the presence of these construction activities and the subsequent interference to material handling and traffic flow caused by the barriers.

Alternatives 4A and 4B involve excavation of contaminated soils and either on-Site disposal or treatment and off-Site disposal. Both of these alternatives are implementable as they use standard excavation equipment and disposal at an engineered disposal facility. Alternative 4A will require the procurement, design, and construction of an on-Site soil disposal site at the site of the existing percolation ponds (CPP-67), which has been previously contaminated from past wastewater disposal practices. Alternative 4B is the most difficult alternative to implement because it requires the removal, treatment, and transportation of large volumes of contaminated soils, great distances off-Site and depends on the availability of available off-Site disposal capability.

Cost—Alternative 1 is the least expensive of the proposed alternatives. Costs increase proportionally for Alternatives 2, 3, 4A, and 4B because of capital cost expenditures. Alternative 4A, which involves disposal of excavated soils and debris, is designed for INEEL-wide disposal. Alternative 4B, which involves treatment and off-Site disposal, is the most costly alternative. A summary of the capital and O&M costs for each alternative is shown in the sidebar. The O&M costs for Alternatives 2, 3, and 4A are based on an institutional control period through the year 2095.

Table 5. Summary of comparative analyses for the Other Surface Soils (Group 3).

Criterion / Alternative:	1	2	3	4A	4B
Overall Protection	Y*	Y*	Y	Y	Y
Compliance with ARARs	Y*	Y*	Y	Y	Y
Long-Term Effectiveness	5	3	3	1	1
Reduction of Toxicity, Mobility, or Volume	N	N	N	Y	Y
Short-Term Effectiveness	1	1	3	3	5
Implementability	1	2	3	3	5
Net Present Value Cost	**$6.8M**	**$15.0M**	**$37.5M**	**$84.9M**	**$208.4M**

* = prior to 2095 indicated alternatives provide overall protection and complies with ARARs.

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable.

Other Surface Soils

Alternative 1	
NPV	
Capital	$3.1M
O&M	$3.7M
Total	$6.8M
Total (FY 97$)	$14.6M
Alternative 2	
NPV	
Capital	$11.3M
O&M	$3.7M
Total	$15.0M
Total (FY 97$)	$23.3M
Alternative 3	
NPV	
Capital	$32.6M
O&M	$5.0M
Total	$37.5M
Total (FY 97$)	$51.8M
Alternative 4A	
NPV	
Capital	$76.6M
O&M	$8.3M
Total	$84.9M
Total (FY 97$)	$111.7M
Alternative 4B	
NPV	
Capital	$222.1M
O&M	$0.0M
Total	$222.1M
Total (FY 97$)	$265.6M

Preferred Alternative

The preferred alternative for the Other Surface Soils is *Alternative 4A, Removal and On-Site Disposal.* Alternative 4A consists of excavating contaminated surface soils to a depth of 10 ft and disposal of the material within the proposed INEEL-wide ICDF, an engineered disposal facility. Contaminated soils present at the release sites will be permanently removed and contained in a engineered facility designed for long-term isolation and protection. The proposed ICDF would be constructed to accept contaminated materials from other INEEL WAGs. The ICDF will isolate the contaminated soils in an engineered disposal facility, will reduce the risk "footprint" at the ICPP and the INEEL, and will provide cost savings because the soils will be managed in a central facility. The agencies believe that the alternative ensures long-term protection of human health and the environment, complies with ARARs, is a permanent solution, and is cost effective.

Perched Water (Group 4)

Although contaminated water may be locally present in the perched water, it is generally not available for consumption and does not pose a direct human health threat, but is a threat to regional aquifer groundwater quality. Three alternatives were developed and evaluated for the perched water to limit exposure to contaminated water:

- Limit water infiltration and soil contaminant leaching and transport to the perched zone
- Reduce the volume of water in the perched zone
- Reduce contaminated perched water releases to the Snake River Plain Aquifer.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 is comprised of existing institutional controls currently implemented at the site. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, perched water monitoring, and wellhead maintenance. These controls will remain in place until 2095. Perched water monitoring will include sampling and analysis of approximately 15 existing perched water wells to determine changes in contaminant concentrations and the extent of perched water distribution. The monitoring will be performed for 20 years after the percolation ponds are removed from service. If the percolation ponds are not taken out of service, perched water monitoring will be conducted until 2095 to verify achievement of RAOs.

Alternative 2—Institutional Controls with Aquifer Recharge Control. Alternative 2 proposes existing and additional institutional controls and initial phased remedies. The existing institutional controls are the same as those described for Alternative 1. The additional institutional controls may include land or regulatory restrictions, such as land use restrictions to prevent inadvertent exposure to contaminated perched water. In addition, approximately six new perched water-monitoring wells would be installed to provide additional information about the deep perched water. The proposed remedies are actions that control sources supplying water to the perched zone. These actions are designed to reduce leaching and transport of soil contaminants to perched water, reduce the volume of water in the perched zone, and minimize contaminated perched water releases to the Snake River Plain Aquifer.

The remedies will be implemented in two phases. Phase 1 includes surface water drainage modifications and controls, discontinuing lawn irrigation at the ICPP, and removal of the percolation ponds from service. A major contribution to the perched water originates from the percolation ponds. Removal of this source will prevent the perched water from degrading to the aquifer to the extent that MCLs are exceeded beyond 2095. Replacement alternatives for the percolation ponds are under investigation. The ultimate discharge location will be moved outside of the zone influencing perched water contaminant transport. "Like for like" replacement percolation ponds and surface discharge to the Big Lost River are being considered. Because the subject wastewater is generated by routine plant operations and is not generated by a CERCLA action, permit is required. Pond replacement will require a Land Application Permit. Discharge to the river will require a National Pollution Discharge Elimination Permit. Monitoring will be performed to assure the adequacy of this remedy. If removal of the percolation ponds alone does not protect the aquifer, then additional controls will be implemented. If additional infiltration control is needed, as determined by monitoring, Phase 2 would be implemented. Phase 2 may include lining or diverting the Big Lost River, repairing leaking fire water lines, curtailing steam condensate discharges to the subsurface, or removing the existing sewage treatment plant lagoons and infiltration galleries. Modifications to the Big Lost River will require additional environmental and regulatory analyses. The OU 3-14 RI/FS will investigate the effects of recharge from the Big Lost River and the ICPP Sewage Treatment Plan to the northern perched water bodies.

Alternative 3—Aquifer Recharge Control and Perched Water Removal, Treatment, and Disposal. Alternative 3 consists of the existing and additional institutional controls and initial phased remedies described for Alternative 2 and localized removal, treatment, and disposal of perched water contaminant hotspots for a period of 25 years. Localized perched water extraction will attempt reduction of contaminant mass and contaminant flux to the Snake River Plain Aquifer. Five new extraction wells would be installed to perform perched water removal and would be included in the perched water monitoring program. The perched water monitoring would be conducted for 25 years at the same periods described for Alternative 2. Contaminated perched water would be removed from the five new wells and nine existing wells using pulsed pumping at low pumping rates to allow for sufficient well recovery. Extracted perched water would be stored in storage tanks and transferred to the PEW evaporator, or new similar treatment unit, for treatment and disposal. Approximately 46 million gal of perched water would be extracted under this alternative.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—All of the proposed perched water alternatives will provide overall protection of human health and the environment during the institutional control period, which ends in 2095. Alternative 1 will only be protective until 2095. Alternative 2 provides overall protection of human health and the environment by eliminating exposure to contaminants using land and groundwater use restrictions and minimizing contaminant transport between the surface soils and the Snake River Plain Aquifer by limiting the available water in the perched zone. The available water will be reduced using surface water controls and by closing the percolation ponds. Decreased water content in the perched zone will increase the contaminant travel times, allowing for radioactive decay and natural attenuation processes to decrease contaminant concentrations and reduce the residual risk in the perched zone and the Snake River Plain Aquifer. Alternative 2 satisfies all of the proposed RAOs. Alternative 3 only provides minor additional protection of human health and the environment over Alternative 2 by removing contaminant mass and decreasing the water content of the perched zone at an increased rate at contaminant hotspots. Table 6 summarizes the comparative analysis of the perched water alternatives.

Compliance with ARARs—Alternative 1 does not satisfy the ARARs. Alternatives 2 and 3 meet all of the ARARs. Plutonium was predicted to reach the Snake River Plain Aquifer at concentrations of concern in the future. This predicted migration of plutonium to the aquifer from contaminated Tank Farm soils would only occur if current transport assumptions for plutonium isotopes hold true and no further actions were taken at the Tank Farm (see Section 6 of the RI/BRA for additional information). Remediation of the radionuclide-contaminated soil sources will be addressed in the Tank Farm RI/FS, OU 3-14. Principal ARARs evaluated were similar to those for Group 2. To the extent that waste water treatment and disposal would be part of the remedial action principal ARARs also National Pollutant Discharge Elimination System and state of Idaho Waste Water Land Application requirements. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5

Long-Term Effectiveness and Permanence—Alternative 1 will not provide long-term protection because no active remedial measures will be implemented. The existing institutional controls temporarily reduce human health and environmental risks, but will only be in effect until 2095. After 2095, Alternative 1 provides no long-term protection. Initial phased remedies implemented as part of Alternative 2 to control aquifer recharge will provide long-term effectiveness and permanence, prior to and beyond 2095, through land use restrictions limiting land and groundwater use and by reducing the water available for contaminant transport in the perched zone. Alternative 2 will minimize the perched water contaminant transport rate between the surface soils and the Snake River Plain Aquifer. Increased transport times will allow for radioactive decay of short-lived radionuclides. Alternative 3 also provides long-term protection of human health and the environment because contaminant transport associated with seepage from the percolation ponds is eliminated. Removing contaminant mass in the perched water and decreasing the water available for contaminant transport by extraction and treatment is not considered to be effective. However, Alternative 3 does not provide more overall protection than Alternative 2 because, after recharge sources are eliminated, pumping results in minimal contaminant mass removal due to limited water availability.

Reduction of Toxicity, Mobility, or Volume Through Treatment—Alternatives 1 or 2 do not reduce the toxicity, mobility, or volume of contaminants through treatment, as treatment is not included in these alternatives. Alternative 3 does reduce contaminant volume through treatment by extracting and treating contaminated perched water at the existing ICPP liquid waste treatment facility. Alternatives 2 and 3 indirectly minimize contaminant mobility by reducing the quantity of water available for contaminant transport in the perched zone.

Short-Term Effectiveness—All of the alternatives can be implemented without any additional risks to the community, workers, or the environment. Alternative 1 poses no additional risk to workers. Implementation of the aquifer recharge controls and extraction and treatment may pose a slight risk increase in exposure or personal injury to workers performing the construction and treatment activities, but will be mitigated using health and safety plans, radiological controls, and safe work practices.

Implementability—All of the alternatives are technically and administratively implementable. None of the alternatives require any special materials, equipment, or personnel that are not readily available at the site or from the local community. Existing institutional controls proposed in Alternative 1 are currently in place at the site and can be easily continued. Alternative 2 is also readily implemented using standard construction methods and requires no special personnel, equipment, or materials. Alternative 2 may pose some implementability challenges, as this alternative requires replacement of the existing percolation ponds and the sewage treatment ponds, which are currently used by ICPP operations. Alternative 3 also poses additional implementability concerns because of the surface and underground utilities that occur throughout the plant that could be damaged by activities such as installation of perched water extraction wells or construction of holding tanks and transfer lines.

Cost—Alternative 1 is the least expensive alternative evaluated because it only involves continuation of existing institutional controls and perched water monitoring. Alternative 2 has higher capital costs than Alternative 1 because of the implementation of aquifer recharge controls. The O&M costs for Alternatives 1 and 2 are similar since perched water monitoring will be conducted under each alternative. Alternative 3 is the most costly alternative analyzed because it involves construction and operation of perched water extraction wells and a water treatment facility for 25 years. A summary of the capital and O&M costs is shown in the sidebar.

Table 6. Summary of comparative analyses for the Perched Water (Group 4).

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	Y*	Y*
Compliance with ARARs	N	Y*	Y*
Long-Term Effectiveness	5	1	1
Reduction of Toxicity, Mobility, or Volume	N	N	Y
Short-Term Effectiveness	1	3	5
Implementability	1	3	5
Net Present Value Cost	**$7.3M**	**$35.6M**	**$259.2M**

* = excluding Tank Farm contaminant contributions, reduced contaminant flux to the SRPA will cause MCLs to be satisfied.

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable.

Perched Water Group

Alternative 1	
NPV	
Capital	**$2.7M**
O&M	**$4.6M**
Total	**$7.3M**
Total (FY 97$)	**$15.8M**
Alternative 2	
NPV	
Capital	**$15.3M**
O&M	**$4.6M**
Total	**$20.0M**
Total (FY 97$)	**$29.3M**
Alternative 3	
NPV	
Capital	**$21.5M**
O&M	**$237.7M**
Total	**$259.2M**
Total (FY 97$)	**$337.3M**

Preferred Alternative

The preferred alternative for the Perched Water is *Alternative 2, Institutional Controls with Aquifer Recharge Control.* Alternative 2 is comprised of existing and additional institutional controls to restrict future perched water use and implementation of initial phased remedies to control water infiltration and perched water releases to the Snake River Plain Aquifer. Phase 1 would include surface water drainage modifications and controls, discontinuing lawn irrigation at the ICPP, and removal of the percolation ponds from service. If additional infiltration control is needed, as determined by monitoring, Phase 2 would be implemented. Phase 2 may include lining or diverting the Big Lost River, repairing leaking fire water lines, curtailing steam condensate discharges to the subsurface, or removing the existing sewage treatment plant lagoons and infiltration galleries. Substitute facilities would need to be sited and constructed prior to implementing this alternative. The agencies believe the preferred alternative is protective of human health and the environment, compliant with ARARs, uses permanent solutions, and is cost effective.

Snake River Plain Aquifer (Group 5)

Contamination in the Snake River Plain Aquifer primarily resulted from historic waste water disposal practices at the ICPP injection well. The COCs are mostly radionuclides and mercury. The contaminated soils and perched water also contribute to future contamination in the Snake River Plain Aquifer. Predictive modeling suggests that if soil source control actions are not taken at the Tank Farm, major additional contamination may be leached and transported to the perched water and the Snake River Plain Aquifer. In the conceptual model, the perched water is also a significant source of contamination in the Snake River Plain Aquifer. Four alternatives were developed to manage the risk posed by contaminants in the Snake River Plain Aquifer.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 is comprised of existing institutional controls presently implemented at the site to minimize potential exposure to contaminated groundwater. No active remediation will be performed under this alternative to alter the existing site conditions. The existing institutional controls include site access restrictions, radiation surveys, groundwater monitoring, and maintenance. These controls will remain in place until 2095. Groundwater monitoring will include sampling and analysis of the 10 existing groundwater wells until 2095 to determine changes in contaminant concentrations and water quality, and the rate of the contaminant plume migration. Groundwater monitoring will be conducted, as necessary, to verify achievement of the RAOs.

Alternative 2A—Institutional Controls, Monitoring, and Source Control. Alternative 2A proposes the existing institutional controls described for Alternative 1, additional institutional controls, and additional monitoring to limit exposure to contaminated groundwater. The additional institutional controls include land or regulatory restrictions, such as land use restrictions, to prevent exposure to contaminated groundwater within the ICPP. In addition, six new groundwater-monitoring wells would be installed to supplement the 10 existing wells. Under this alternative, contaminants present in the Snake River Plain Aquifer will decrease in concentration by radioactive decay and dispersion. Source control measures, included in other alternative remedies (Group 4 Alternatives 2 and 3), significantly decreases future contamination in the Snake River Plain Aquifer. Predictive modeling demonstrates that if the contaminant contributions from the perched water mobilized by the percolation ponds are eliminated by relocation of the percolation ponds, then contaminant concentrations in downgradient production wells will remain within acceptable limits. Monitoring will be conducted to assess reduction of contaminant levels in the Snake River Plain Aquifer and to ensure that no down-gradient receptors will be impacted. Monitoring will be maintained until the contaminant concentrations are below the RAOs.

Alternative 2B—Institutional Controls with Monitoring and Contingent Remediation. Alternative 2B proposes the existing institutional controls for Alternative 1 and the same additional institutional controls as in Alternative 2A. In addition, Alternative 2B requires active groundwater remediation if sufficient quantities of I-129 are found above an action level of 11.0 pCi/L.

This action level, which is based on modeling results described in Section 5.3.2.3 of the FS supplement, ensures that existing concentrations of I-129 measured in the Snake River Plain Aquifer will not result in groundwater concentrations in the year 2095 exceeding the derived MCL of 1 pCi/L. The modeling accounts for attenuation and dispersion. If the average I-129 concentration over four consecutive calendar quarters exceeds the action limit, then treatability studies will commence to evaluate methods to remove I-129 from the groundwater. In addition, further monitoring will be performed to define the optimum path forward.

If active remediation is required, based on groundwater monitoring, groundwater will be extracted from the zone of maximum contamination. Maximum contaminant levels are expected to occur in a thin, low permeability layer separating basalt units. Selective withdrawal in this layer will significantly limit withdrawal of groundwater below the action level and reduce mixing of clean groundwater with contaminated groundwater. Groundwater will be extracted from about 20 wells at an estimated rate of 1 gpm per well. The actual number of wells and extraction rates will be determined during remedial design. Actual treatment technologies will be selected during the proposed treatability studies. For comparison and cost estimating purposes, the most likely treatment technology, ion exchange, is assumed to be part of this alternative. After treatment, extracted groundwater will be reinjected at a location up-gradient. Remedial action will be terminated following the removal of the specified volume of groundwater.

Alternative 3—Contingent Localized Groundwater Removal, Treatment, and Disposal. Alternative 3 includes the existing and additional institutional controls described for Alternative 2A and 2B, and, if observed concentrations exceed the action level, localized removal, treatment, and disposal of Snake River Plain Aquifer hotspots until 2095. Groundwater will be extracted from the full vertical extent of the aquifer without targeting any specific layer. Groundwater extraction from within hotspots will locally reduce the contaminant mass in the aquifer. Five new extraction wells and six new injection wells will be installed in areas of high contaminant concentrations in the Snake River Plain Aquifer to depths of about 600 ft below ground level. Groundwater will be extracted from the extraction wells at about 500 gpm per well. The total pumping rate will be about 2,500 gpm. Actual treatment technologies will be selected during the proposed treatability studies. For comparison and cost estimating purposes, the most likely candidate treatment technology, ion exchange, is assumed to be part of this alternative. Extracted groundwater will be treated in a newly constructed water treatment plant using ion exchange to concentrate the contaminants. The concentrated waste will be treated at the PEW evaporator or a similar on-Site facility and disposed on-Site. The remediated water will be reinjected into the aquifer through the six injection wells. Remediation could be challenging and may require treatability studies because current technology is not sufficiently developed to remove I-129 to this concentration. Groundwater extraction and injection will also reduce contaminant transport by hydraulically controlling the contaminant plume in localized areas. A total of approximately 130 billion gal of water, over the 100-year operating life, would be extracted and treated under this alternative.

Alternatives Evaluation

Overall Protection of Human Health and the Environment—Each of the proposed alternatives temporarily eliminate human health and environmental risks using existing institutional controls. Alternative 1 will not provide human health protection beyond the year 2095. Alternatives 2A, 2B, and 3 provide long-term protection through implementation of additional institutional controls such as land use restrictions until groundwater cleanup goals are achieved. These controls would limit land and groundwater use as long as they remain in place. According to the conservative groundwater modeling, Alternative 2A may not satisfy MCLs by 2095 unless contaminants mobilized by water flow through the percolation ponds are eliminated. Groundwater monitoring is required to verify that RAOs are being achieved. Alternatives 2B and 3 contain contingent active remediation of the Snake River Plain Aquifer to meet MCLs by 2095, if predetermined action levels are exceeded. Table 7 summarizes the comparative analysis of the Snake River Plain Aquifer alternatives.

Compliance with ARARs—Alternative 1 does not comply with ARARs beyond the restricted industrial use period. Alternatives 2A, 2B, and 3 are predicted to achieve ARARs before 2095. The principal ARAR evaluated was IDAPA 16.01.11.20, the state of Idaho Groundwater Quality Standards for the protection of drinking waters. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5.

Long-Term Effectiveness and Permanence—Alternative 1 does not provide any measure of long-term protection because no remedial actions will be performed, other than existing institutional controls, which end in 2095. Land use restrictions limiting land and groundwater use proposed in Alternative 2A will provide long-term protection beyond 2095 as long as the restrictions remain in place. Active remediation in Alternatives 2B and 3 and source controls included in Alternative 2A will provide long term effectiveness by removal of I-129 from the groundwater. The risk reduction achieved using Alternative 3 does not provide additional longterm benefit compared to Alternative 2A or 2B. Since Alternative 2A achieves the same level of risk reduction at a lower cost, it is considered superior to Alternative 3.

Reduction of Toxicity, Mobility, or Volume Through Treatment—Alternatives 1 and 2A do not reduce toxicity, mobility, or volume through treatment, as treatment is not included in these alternatives. Alternative 2A reduces both volume and toxicity of contaminants in the Snake River Plain Aquifer. Alternatives 2B and 3 will reduce contaminant mobility using hydraulic controls and contaminant volume using extraction and treatment.

Short-Term Effectiveness—All of the alternatives can be implemented without any additional risks to the community or the environment. Alternatives 2B and 3 pose a minor short-term risk from personal injury to workers during extraction and injection well installation and construction of the treatment facilities. The potential for injury risks will be minimized using health and safety plans and safe work practices. All alternatives provide short-term effectiveness. Alternative 3 meets the RAOs in the shortest period of time.

Implementability—Alternatives 1 and 2A are technically and administratively implementable. The existing institutional controls are currently implemented at the site and are easily continued. Most of the additional institutional controls proposed under Alternative 2A and 2B have been used at numerous Superfund sites and pose no special implementability concerns. Groundwater extraction, treatment, and injection technologies proposed under Alternatives 2B and 3 pose implementability concerns regarding handling of excessive volumes of extracted water and available groundwater treatment technologies for I-129 removal. Groundwater extraction and injection at depths of 600 ft can be implemented without any special personnel, equipment, or materials. Alternatives 2B and 3 will also require handling and treatment of millions to billions of gallons of contaminated groundwater. Current ion exchange technologies are limited in their ability to remove iodine to very low concentrations. Extensive bench-scale treatability testing may be required to determine the most appropriate ion exchange resin for the low concentration contaminants present in the Snake River Plain Aquifer groundwater. In addition, extraction of contaminated groundwater from the low permeability layer is more technically challenging than aquifer extraction contemplated in Alternative 3.

Cost—Alternative 1 is the least costly of the alternatives evaluated. Alternative 2A is more costly because of additional monitoring costs. Alternatives 2B and 3 are higher because they include extraction and treatment costs. Alternative 3 treatment capacity is much larger than 2A, yielding higher costs. A summary of the capital and O&M costs for each alternative is shown in the sidebar.

Table 7. Summary of comparative analyses for the Snake River Plain Aquifer (Group 5).

Criterion / Alternative:	1	2A	2B	3
Overall Protection	N	Y	Y	Y
Compliance with ARARs	N	Y	Y	Y
Long-Term Effectiveness	5	3	3	3
Reduction of Toxicity, Mobility, or Volume	N	N	Y	Y
Short-Term Effectiveness	1	1	3	3
Implementability	1	1	5	4
Net Present Value Cost	**$13.9M**	**$14.8M**	**$39.8M**	**$787.9M**

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable.

Snake River Plain Aquifer Group

Alternative 1	
NPV	
Capital	**$5.1M**
O&M	**$8.8M**
Total	**$13.9M**
Total (FY 97$)	**$28.9M**
Alternative 2A	
NPV	
Capital	**$5.1M**
O&M	**$9.7M**
Total	**$14.8M**
Total (FY 97$)	**$31.0M**
Alternative 2B	
NPV	
Capital	**$20.7M**
O&M	**$19.1M**
Total	**$39.8M**
Total (FY 97$)	**$56.2M**
Alternative 3	
NPV	
Capital	**$56.3M**
O&M	**$731.6M**
Total	**$787.9M**
Total (FY 97$)	**$1,031.4M**

Preferred Alternative

The preferred alternative for the Snake River Plain Aquifer is *Alternative 2B, Institutional Controls with Monitoring and Contingent Remediation.* Alternative 2B consists of (a) maintaining institutional controls over the area of the contaminant plume to prevent exposure to contaminated groundwater, (b) monitoring to determine if groundwater concentrations exceed a specified action level, and (c) treatability studies and active remediation if action levels are exceeded. The action level triggering remediation is based on the maximum concentration of I-129 expected to yield contaminant concentrations above the MCL of 1 pCi/L at the end of the institutional control period. If monitoring data exceeds the action level, treatability studies will be performed. If needed, four treatability studies are expected to be performed to evaluate treatment and extraction technologies. Following the treatability studies active remediation will occur, if necessary. The agencies believe the preferred alternative is protective of human health and the environment, complies with ARARs, uses a permanent solution, and is cost effective.

Buried Gas Cylinders (Group 6)

The Buried Gas Cylinders group is comprised of Sites CPP-84 and CPP-94. These sites generally contain buried compressed gas cylinders that contain construction gases at Site CPP-84 and hydrofluoric acid at Site CPP-94. The exact number of cylinders is unknown, but is estimated to be between 40 and 100. The principal threat posed by either of these sites is the potential for an injury caused by puncture or explosion of the cylinders. A risk assessment was not performed for these sites during the RI/BRA. Three alternatives were developed and evaluated for the Buried Gas Cylinders to address the acute safety hazards posed by these sites.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 consists of existing institutional controls. Under Alternative 1, no active remediation will be performed at the site. The existing institutional controls will consist of security, access restrictions, site inspections, and environmental monitoring until 2095.

Alternative 2—Removal, Treatment, and Disposal. Alternative 2 consists of the removal, ex situ treatment, and disposal of the gas cylinders at each site. This alternative will also include initial site characterization using geophysical surveys to determine the location and quantity of buried gas cylinders prior to removal. After the cylinders are located, they will be removed using conventional excavation techniques within a containment structure. Gases present in the excavated cylinders will be vented to the atmosphere if they are benign or treated using a method suitable for the particular gas. A contractor that specializes in gas cylinder removal, treatment, and disposal will perform Alternative 2. The subcontractor performing work at an appropriate off-Site facility will dispose of any treatment residuals. The sites will be maintained under existing institutional controls until the cylinders are removed, treated, and disposed.

Alternative 3—Containment. Alternative 3 consists of the existing institutional controls described for Alternative 1, additional institutional controls, and containment. Additional institutional controls will include land-use or regulatory restrictions. The principal component of Alternative 3 is containment using an engineered barrier. The barrier will consist of natural earthen materials designed to isolate the buried gas cylinders and to minimize moisture infiltration at the site for up to 1,000 years. A concrete pad will be poured over each of the sites prior to placement of the engineered barrier to minimize the potential for an uncontrolled gas release during barrier construction.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—Alternatives 2 and 3 provide overall protection of human health and the environment. Alternative 1 does not provide overall protection because no effective access controls are in force at these sites. Alternatives 2 and 3 fully satisfy the RAOs for the buried gas cylinder sites. Alternative 3 achieves the RAOs through containment and will be protective for at least 1,000 years. Alternative 3 may be protective beyond 1,000 years, but it was only evaluated for the minimum design life of the barrier. Alternative 2 provides the most overall protection at the buried gas cylinder sites because the hazardous reactive and ignitable gasses will be removed, treated, and disposed in an engineered disposal facility. Table 8 summarizes the comparative analysis of the Buried Gas Cylinders alternatives.

Compliance with ARARs—Alternative 1 does not comply with ARARs during the 100-year institutional control period. Alternative 2 satisfies all of the ARARs using engineering controls and proper disposal procedures. Alternative 3 complies with all of the ARARs during the barrier's 1,000-year functional design life. Beyond 1,000 years, it is assumed that the waste and the large soil mass comprising the barrier will continue to minimize risks. Principal ARARs evaluated included, Idaho Fugitive Dust Emissions rules, Hazardous Waste Determination requirements, the federal Off-site Rule, and Land Disposal Restrictions. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5.

Long-Term Effectiveness and Permanence—Alternative 1 does not provide any measure of long-term effectiveness or permanence. Alternative 2 will provide the highest degree of long-term effectiveness and permanence. The buried gas cylinders will be removed and treated. The remaining cylinder casings and treatment residue will be disposed in an approved treatment, storage, and disposal facility. Alternative 3 provides a high degree of long-term effectiveness and permanence by containing the waste. The use of the containment barrier would reduce the current risk to human and ecological receptors for the design life of the barrier.

Reduction of Toxicity, Mobility, or Volume Through Treatment— Alternative 1 does not reduce the toxicity, mobility, or volume of waste through treatment since treatment is not included in this alternative. Alternative 2 includes treatment to reduce the toxicity, mobility, and volume of the hazardous components in the buried gas cylinders. Alternative 3 does not reduce contaminant toxicity or volume through treatment. Contaminant mobility is reduced through installation of an engineered barrier over the buried gas cylinders, which will minimize contaminant mobility in the event of a release by isolating the cylinders beneath a large mass of earth materials.

Short-Term Effectiveness—All of the alternatives can be implemented without any significant additional risk to the community or the environment. The primary risk to the community and the environment from these alternatives involves fugitive dust or toxic air emissions, which will be controlled with dust suppressants and engineering controls. Additional risk may occur to workers while implementing alternatives during characterization, removal, and treatment of the buried gas cylinders. Hazardous gas exposure and occupational injuries will be minimized through the use of personnel trained in industrial hygiene, safe work practices, and health and safety. Alternative 1 provides the greatest degree of short-term effectiveness because remediation will not be conducted to change the current site conditions. Alternative 2 has the least short-term effectiveness because of the possibility for explosion or chemical exposure of workers implementing these alternatives. Alternative 2 will achieve the RAOs in the shortest time. Alternative 3 poses a minor risk to workers from exposure to hazardous gases and projectiles during placement of the stabilization pad and construction of the engineered barrier.

Implementability—Each of the alternatives retained for detailed analysis is technically and administratively implementable. The necessary personnel, services, and materials are readily available. Alternative 1 only requires a continuation of the existing institutional controls already implemented at the site. Alternative 2 requires specialized construction equipment and materials. Buried compressed gas cylinder retrieval and treatment is an available commercial technology that can be used on the identified contaminants and is readily implemented by a specialty contractor. Alternative 3 is technically and administratively implementable. Alternative 3 requires no specialized construction personnel, equipment, or materials. Existing institutional controls are currently implemented at the site and are easily continued. Construction of an engineered barrier is similar to other types of earthwork, such as highway construction, and can be readily implemented.

Cost—Alternative 2 is the least costly of the alternatives evaluated. Alternatives 1 and 3 are similar in cost and are much more costly than Alternative 2 because these alternatives include 100 years of environmental monitoring, whereas, Alternative 2 does not include environmental monitoring after the buried gas cylinders are removed. Alternative 3 is the most expensive alternative because it includes increased capital costs for constructing an engineered barrier and provides for environmental monitoring during the 100-year institutional control period. A summary of the capital and O&M costs for each alternative is shown in the sidebar.

Preferred Alternative

The preferred alternative for the Buried Gas Cylinders is *Alternative 2, Removal, Treatment, and Disposal.* Alternative 2 consists of the removal of the gas cylinders, treatment of the contents, if necessary, and recycling of the gas cylinder containers. Inert gases such as compressed air, carbon dioxide, helium, nitrogen, and argon, will be purged directly to the atmosphere without treatment. Acetylene will be purged to a secondary vessel for subsequent treatment by thermal oxidation. Hydrogen fluoride

Table 8. Summary of comparative analyses for the Buried Gas Cylinders (Group 6).

Criterion	Alternative 1	Alternative 2	Alternative 3
Overall Protection	N	Y	Y
Compliance with ARARs	Y	Y	Y
Long-Term Effectiveness	5	1	3
Reduction of Toxicity, Mobility, or Volume	N	Y	N
Short-Term Effectiveness	1	5	3
Implementability	1	3	3
Net Present Value Cost	**$6.4M**	**$1.8M**	**$8.2M**

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable.

Buried Gas Cylinders

Alternative 1	
NPV	
Capital	**$2.7M**
O&M	**$3.7M**
Total	**$6.4M**
Total (FY 97$)	**$13.7M**
Alternative 2	
NPV	
Capital	**$1.8M**
O&M	**$0**
Total	**$1.8M**
Total (FY 97$)	**$1.9M**
Alternative 3	
NPV	
Capital	**$4.5M**
O&M	**$3.7M**
Total	**$8.2M**
Total (FY 97$)	**$15.3M**

be will purged to a secondary vessel and treated by neutralization. Abandonment of the cylinders presents a significant safety hazards should the cylinders burst from over-pressurization. The agencies believe this alternative will alleviate the inherent safety hazard of the sites, comply with ARARs, use permanent solutions, and are cost effective.

SFE-20 Hot Waste Tank System (Group 7)

Based on the results of the preliminary investigation conducted at the SFE-20 site in 1984, radiological contamination is present within the tank liquids and sludges and on the tank, tank vault, and pump pit surfaces. The principal threat posed by the SFE-20 tank system is a release of the radioactive contaminants from the tank due to loss of integrity that could potentially contaminate soils, perched water, or groundwater beneath the site. At present, there is no exposure to humans or ecological receptors under existing conditions given that the tank vault is 10 ft below the ground surface and area access is restricted. However, radiation exposure could occur if the existing access restrictions are not maintained. Four alternatives were developed and evaluated for the SFE-20 tank system to limit exposure to radiation or to minimize the potential for a release to occur from the tank system.

Alternatives Descriptions

Alternative 1—No Action with Monitoring. Alternative 1 consists of existing institutional controls. Under Alternative 1, no active remediation will be performed at the site. The existing institutional controls will consist of security, access restrictions, site inspections, environmental monitoring, and general maintenance until 2095.

Alternative 2—In Situ Stabilization with Containment. Alternative 2 consists of the existing institutional controls described for Alternative 1, additional institutional controls, in situ treatment, and containment. Additional institutional controls will include land-use and regulatory restrictions. The principal component of Alternative 2 is containment using an engineered barrier. The barrier will consist of natural earthen materials designed to minimize moisture infiltration at the site for up to 1,000 years. Prior to placing the barrier, the tank system, including the tank vault, will be filled with concrete grout to minimize differential settlement after capping.

Alternative 3—Liquid Removal and Treatment with In Situ Stabilization. Alternative 3 consists of existing and additional institutional controls described for Alternative 2, removal and ex situ treatment of the tank liquid, and in situ treatment of the tank sludge, tank, and associated structures. The tank liquid will be removed and treated at the PEW evaporator. The tank sludge, tank, and associated structures will be filled with concrete or similar grout to solidify and stabilize the contaminants that remain.

Alternative 4—Removal, Treatment, and Disposal. Alternative 4 includes the existing institutional controls described for Alternative 1, removal and ex situ treatment of the tank liquid and sludge, and excavation, removal, and on-Site disposal of the tank and associated structures. The tank liquid will be removed and treated as described in Alternative 3. The tank sludge will be removed and treated (ex situ) using a suitable grout to solidify and stabilize the contaminants in the sludge. The sludge will be drummed and disposed at a suitable engineered disposal facility. The remaining components of the tank system will be excavated, removed, and disposed either in the

INEEL-wide ICDF or off-Site depending on the ICDF waste acceptance criteria. The excavation will be backfilled to grade with clean soils.

Alternatives Evaluations

Overall Protection of Human Health and the Environment—Alternative 1 is not protective of human health and the environment because no active remedial measures exist to limit the threat of contaminant release to the environment that would impact the groundwater. Alternatives 2, 3, and 4 are the only alternatives that fully satisfy the tank system RAOs. Alternative 2 achieves the RAOs through in situ treatment and containment and will be protective for at least 1,000 years. Alternative 2 probably is protective beyond 1,000 years, but it was only evaluated for the minimum design life of the barrier. Alternatives 3 and 4 provide the greater protection of the SFE-20 tank system alternatives because the radioactive liquids and/or sludges will be removed, treated, and disposed in an engineered disposal facility. Alternative 4 provides the most overall protection of human health and the environment. Table 9 summarizes the comparative analysis of the SFE-20 tank system alternatives.

Compliance with ARARs—Alternative 1 does not comply with the ARARs either during the 100-year institutional control period or beyond. Alternative 2 complies with all of the ARARs and TBCs during the barrier's 1,000-year functional design life. Beyond 1,000 years, it is assumed that the solidified waste and the large soil mass comprising the barrier will continue to minimize exposure risks from alpha-emitting radionuclides and satisfy all of the ARARs and TBCs. Principal ARARs evaluated included hazardous waste landfill closure requirements, treatment requirements, and land disposal restrictions. Additional discussion on the ARARs can be found in the FS and FS supplement, Section 5.

Long-Term Effectiveness and Permanence—Alternative 1 does not provide any measure of long-term effectiveness or permanence beyond the institutional control period, which ends in the year 2095. Alternative 2 provides a high degree of long-term effectiveness and permanence by solidifying and containing the waste. Alternative 3 will provide a high degree of long-term effectiveness and permanence because the tank liquid will be removed, treated and disposed, the tank sludge solidified using grout, and the tank and associated structures filled with grout to prevent future exposures. Alternative 4 will provide the highest degree of long-term effectiveness and permanence because the tank liquid and sludge will be removed, treated, and disposed, and the remaining components of the tank system will be excavated and disposed at the proposed INEEL-wide ICDF.

Reduction of Toxicity, Mobility, or Volume Through Treatment— Alternative 1 does not reduce the toxicity, mobility, or volume of waste through treatment since treatment is not included in this alternative. Alternatives 2, 3, and 4 include treatment to reduce the mobility or volume of the radioactive liquid and sludge. The toxicity of the radionuclides is not directly reduced by any of these alternatives.

Short-Term Effectiveness—All of the alternatives can be implemented without any significant additional risk to the community or the environment. The primary risk to the community and the environment from these alternatives involves fugitive dust or toxic air emissions, which will be controlled with dust suppressants and engineering controls. Additional risk may occur to workers while implementing the alternative because of radiation exposure during characterization, removal, and treatment of the tank liquids and sludges. External radiation exposure and occupational injuries will be minimized through the use of personnel trained in radiological controls, safe work practices, and health and safety plans to maintain exposures ALARA. Alternative 1 provides the greatest degree of short-term effectiveness because remediation is not required and will prevent worker-exposure. Alternative 2 poses a minor risk to workers from direct exposure to radiation during grouting of the tank system and construction of the barrier. Alternative 3 and 4 have the least short-term effectiveness because of the higher possibility for external radiation exposure of workers implementing these alternatives. Alternatives 3 and 4 will achieve the RAOs in the shortest time.

Implementability— Each of the alternatives retained for detailed analysis is technically and administratively implementable and the necessary personnel, services, and materials are locally available. Alternative 1 is readily implemented, as it requires no change in the existing operations and conditions at the site. Alternative 2 requires no specialized construction equipment or materials. Grouting is a common technology that is routinely used to isolate wastes and is readily implemented. An engineered barrier is also a demonstrated remediation technology that uses standard earth moving methods for construction. Barriers are routinely used to control leaching and transport of wastes and has been used at numerous waste sites. Alternatives 3 and 4 are more difficult to implement than Alternatives 1 and 2 because of the potential for construction workers to be exposed to radiation or occupational injury during the characterization, removal, handling, treatment, or disposal of the tank liquids, sludges, and other components. Engineering controls, health and safety plans, radiation controls, and safe work practices will be used to minimize radiation exposure and reduce personal injury. Treatment of similar tank liquids at the PEW evaporator is routinely conducted and would be reliable for these alternatives. Solidification of the tank system is readily implemented, as grouting is a demonstrated technology that has been used at numerous Superfund sites.

Cost—Alternative 4 is the least costly of the alternatives evaluated for the SFE-20 tank system. Alternatives 1, 2, and 3 are similar in total costs but vary slightly in capital costs. Alternative 4 is much less expensive than the other alternatives because Alternative 4 does not include long-term environmental monitoring for the 100-year institutional control period. Alternatives 2 and 3 cost essentially the same because of higher capital costs. Alternative 2 is the most expensive alternative because it includes capital costs for grouting the tank system and constructing an engineered barrier. A summary of the capital and O&M costs for each alternative is shown in the sidebar.

Table 9. Summary of comparative analyses for the SFE-20 Tank System (Group 7).

Alternative:	1	2	3	4
Criterion				
Overall Protection	N	Y	Y	Y
Compliance with ARARs	N	Y	Y	Y
Long-Term Effectiveness	5	3	3	1
Reduction of Toxicity, Mobility, or Volume	N	Y	Y	Y
Short-Term Effectiveness	1	3	5	5
Implementability	1	3	5	5
Net Present Value Cost	**$6.4M**	**$8.7M**	**$8.5M**	**$4.6M**

5 = least satisfies criterion; 1 = best satisfies criterion; NA = not applicable

SFE-20 Tank System

Alternative 1	
NPV	
Capital	$2.7
O&M	$3.7
Total	$6.4M
Total (FY 97$)	$13.7M
Alternative 2	
NPV	
Capital	$5.0
O&M	$3.7M
Total	$8.7M
Total (FY 97$)	$16.1M
Alternative 3	
NPV	
Capital	$4.8M
O&M	$3.7M
Total	$8.5M
Total (FY 97$)	$15.9M
Alternative 4	
NPV	
Capital	$4.6
O&M	$0
Total	$4.6M
Total (FY 97$)	$4.8M

Preferred Alternative

The preferred alternative for the SFE-20 Hot Waste Tank System is *Alternative 4, Removal, Treatment, and Disposal.* Alternative 4 consists of existing institutional controls, removal and ex situ treatment of the tank liquid and sludge, and excavation, removal, and on-Site disposal of the tank and associated structures. The tank liquid will be removed and treated as described in Alternative 3. The tank sludge will be removed and treated (ex situ) using a suitable grout to solidify and stabilize the contaminants in the sludge. The sludge will be drummed and disposed either on-Site or off-Site at a suitable engineered disposal facility. Depending on waste characteristics, the remaining components of the tank system will be excavated, removed, and disposed in the INEEL-wide ICDF or off-Site, depending on the ICDF waste acceptance criteria. The excavation will be backfilled to grade with clean soils. The agencies believe that this alternative is protective of human health and the environment, uses permanent solutions, and is cost effective.

Proposed No Action and No Further Action Sites

No further action—a site where no additional remedial action or site controls are required to achieve an acceptable risk levels.

No action site—a site that has no contaminant source or has a contaminant source with an acceptable risk level in the baseline risk assessment.

No further action site—a site that has a contaminant source or a potential contaminant source present that does not have an exposure route available under current site conditions. These sites would be included in the CERCLA 5-year review process to verify the effectiveness of the no further action decision.

Track 1 investigation—an investigation performed on low probability hazardous waste sites at the INEEL to provide qualitative estimates of risk. They did not involve additional field data collection and relied on the evaluation of existing information.

Track 2 investigation—a limited field investigation of a site under the FFA/CO, and the associated risk analysis.

The agencies propose that no action or ***no further action*** be taken under CERCLA at 51 sites. Ten sites were remanded to ***no action sites*** with the signing of the FFA/CO. Forty-one sites were determined to be ***no further action sites*** through ***Track 1*** and ***Track 2 investigations*** and RI/BRA analysis. Four sites are being managed under other regulatory authority. One site will be addressed by the INEEL asbestos abatement program and three sites will be addressed by the INEEL solid waste management program. A summary of these sites is provided in the Update Fact Sheet, September 1998. The basis for assumptions leading to either type of determination is summarized for the 51 sites in Table 10. The no further action status of these sites will be reviewed during the CERCLA 5-year review process to ensure the protectiveness of the remedial actions taken under the ROD. Review of the no further action sites is necessary because continued operations of the ICPP may adversely impact these sites. Five-year reviews will also ensure that any changes in the physical configuration of any ICPP facility or site where there is suspicion of a release of hazardous or radioactive substances (such as D&D) will be managed to achieve remediation goals established in the ROD. The 5-year reviews will continue until the agencies make a decision that it is no longer necessary.

Preferred Alternative Identification

With the exception of the Tank Farm release sites, the agencies have identified a preferred final remedy for each release site group based on the alternative analyses presented in the FS and FS supplement and summarized in this Proposed Plan. The alternatives identified were developed to reduce the principal threats to human health and the environment posed by the release sites. A final risk management decision concerning the Tank Farm release sites has been postponed and will be developed following additional site characterization and remedial alternatives analysis, which will be presented in a separate RI/FS, OU 3-14. An interim action is proposed at the Tank Farm until a final risk management decision is made by the agencies. The interim action implemented will be consistent with the final remedy.

A summary of recommended alternatives with brief descriptions and estimated costs is presented on Table 11. Presented costs remain independent for each alternative. The costs of common elements in selected alternatives will be combined in final cost estimates prepared for the ROD to reflect efficiencies and economies of scale. Redundant costs in soil groups are deliberately retained to facilitate comparison of competing alternatives.

Table 10. Summary of basis for NA and NFA recommendations.

SITE	OU	DESCRIPTION	No ACTION	NO FURTHER ACTION	BASIS AND DECISION DOCUMENT
CPP-06	3-09	Trench east of CPP-603 fuel storage basin		X	BRA
CPP-07	3-02	Soil Contamination northwest of CPP-642	X		Track 1
CPP-12	3-02	Contaminated paint chips and pad south of CPP-603	X		Track 1
CPP-16	3-07	Contaminated soil from leak in line from CPP WM-181 to PEW	X		Track 2
CPP-17	3-09	Soil storage area south of CPP Peach Bottom fuel storage area		X	BRA
CPP-18	3-02	Gas storage building current location of CPP-668	X		Track 1
CPP-21	3-02	Solid waste storage bin south of CPP-601	X		Track 1
CPP-22	3-09	Particulate air release south of CPP-603		X	BRA
CPP-24	3-07	CPP Tank Farm Area bucket spill	X		Track 2
CPP-29	3-08	Contaminated soil north and west of the main stack (CPP-708)	X		Track 2
CPP-30	3-07	Contaminated soil in the Tank Farm area near Valve Box B-9	X		Track 2
CPP-39	3-13	CPP HF storage tank (YDB-105) and dry well		X	BRA
CPP-40	3-06	Lime pit at base of CPP-601 berm and french drain		X	BRA
CPP-41	3-03	Fire training pits between CPP-666 and CPP-663		X	Track 1
CPP-42	3-10	Drainage ditch west of CPP-637		X	Track 2
CPP-43	none	Grease pit south of CPP-637	X		FFA/CO
CPP-45	3-11	CPP-621 chemical storage area spills		X	Track 2
CPP-46	3-10	CPP-637 courtyard pilot plant release		X	BRA
CPP-47	3-06	Pilot plant storage area west of CPP-620		X	Track 1
CPP-48	3-13	French drain south of 633		X	BRA
CPP-49	3-01	PCB transformer yard (CPP-705)		X	Track 1
CPP-50	3-01	PCB transformer yard (CPP-731)		X	Track 1
CPP-51	3-01	PCB staging area west of CPP-660		X	Track 1
CPP-52	none	Pickling shed east of CPP-631	X		FFA/CO
CPP-53	3-02	Paint and paint solvent area south of CPP-697	X		Track 1
CPP-54	3-02	Drum storage area west of CPP-660	X		Track 1
CPP-56	3-10	Nitric acid contamination south of CPP-734		X	Track 2
CPP-57	3-02	Sulfuric acid spill east of CPP-606		X	Track 1
CPP-59	3-02	Kerosene tank overflow west of CPP-633		X	Track 2
CPP-60	3-02	Paint shop at present location of CPP-645		X	Track 1
CPP-61	3-01	PCB spill in CPP-718 transformer yard		X	BRA
CPP-62	3-02	Mercury contaminated area near CPP TB-4	X		Track 1
CPP-63	3-02	Hexone spill by CPP-710		X	Track 1
CPP-64	3-02	Hexone spill west of CPP-660		X	Track 1
CPP-68	3-02	Abandoned gasoline tank CPP VES-UTIL-652	X		Track 1
CPP-70	none	Septic tank east of CPP-655	X	X	FFA/CO
CPP-71	none	Seepage pits west of CPP-656	X		FFA/CO
CPP-72	none	CPP-758 cesspool east of CPP-651	X		FFA/CO
CPP-73	none	Leaching cesspool east of CPP T-15	X		FFA/CO
CPP-74	none	Seepage pit and septic tank west of CPP-626	X		FFA/CO
CPP-75	none	Septic tank and cesspool west of CPP-603	X		FFA/CO
CPP-76	none	Septic tank and cesspool west of CPP-659	X		FFA/CO
CPP-77	none	Seepage pit and cesspool west of CPP-662	X		FFA/CO
CPP-78	3-09	Contaminated soil west of CPP-693, east of dry fuel storage area		X	BRA
CPP-81	3-12	Abandoned CPP-637/CPP-601 VOG line	X		Track 1
CPP-82	3-12	Abandoned line (3.8 cm) (1.5 in.) PLA-766 west of Beech Street	X		Track 1
CPP-85	3-13	Waste Calcining Facility blower corridor		X	BRA
CPP-86	3-13	CPP-602 waste trench sump		X	BRA
CPP-88	3-13	Radiologically contaminated soil		X	BRA
CPP-90	3-13	CPP-709 ruthenium detection		X	BRA
CPP-95	3-13	ICPP wind blown plume		X	BRA

Table 11. Summary of recommended remedies.

SOIL GROUP	RECOMMENDED ALTERNATIVE	COST ($M) NPV	COST ($M) 1997$
1—Tank Farm	Alternative 3 · Existing Institutional Controls · Additional Institutional Controls · Surface Water Controls	15.2	16.3
2—Soils Under Buildings	Alternative 2 · Institutional Controls · Containment	9.2	17.9
3—Other Surface Soils	Alternative 4A · Removal · On-Site Disposal	84.9	111.7
4—Perched Water	Alternative 2 · Institutional Controls · Recharge Control	20.0	29.3
5—Snake River Plain Aquifer	Alternative 2B · Institutional Controls · Monitoring · Contingent Remediation	39.8	56.2
6—Buried Gas Cylinders	Alternative 2 · Removal · Treatment · Disposal	1.8	1.9
7—SFE – 20 Tank System	Alternative 4 · Removal · Treatment · Disposal	4.6	4.8
TOTAL		175.5	238.1

INEEL CERCLA DISPOSAL FACILITY ESTIMATED COSTS (DISPOSAL COSTS ONLY)

Cost in $M

	NPV			1998 $		
	Capital Costs	O&M Costs	Total	Capital Costs	O&M Costs	Total
INEEL Disposal Facility						
Site-Wide Facility Costs	173.2	13.7	186.9	204.7	30.9	235.6
OU 3-13 Pro-Rata Share[a]	57.7	6.9	64.6	68.2	15.5	83.7
Off-Site Disposal						
Site-Wide Facility Costs	605.4	0.0	605.4	712.8	0.0	712.8
OU 3-13 Pro-Rata Share[a]	201.8	0.0	201.8	237.6	0.0	237.6

a. Included in calculation of Soil Group 3 costs above.

The possibility exists that contaminated environmental media not identified by the INEEL FFA/CO or in this comprehensive investigation will be discovered in the future as a result of routine operations, maintenance activities, and D&D activities at the ICPP. These will be addressed using the new site inclusion process defined in the FFA/CO. The CERCLA 5-year review process will ensure the protectiveness of the remedial actions taken under the ROD. Five-year reviews will also ensure that any changes in the physical configuration of any ICPP facility or site where there is suspicion of a release of hazardous or radioactive substances (such as D&D) will be managed to achieve remediation goals established in the ROD.

In addition, legacy waste that has been generated as a result of previous sampling activities at WAG 3 (i.e., investigation derived waste) will be appropriately characterized, assessed, and dispositioned in accordance with regulatory requirements to achieve remediation goals consistent with remedies proposed for sites in this plan.

After you review this plan, you are encouraged to contact representatives of the DOE, INEEL Community Relations Plan Office, State of Idaho, or EPA Region 10.

Public Involvement Activities

You may wish to ask questions, request a briefing, or seek additional background information regarding this Proposed Plan. Public meetings will be held at the locations listed below.

From 4 to 9 p.m., representatives from the agencies will be available to discuss concerns and issues related to this Proposed Plan. At 7 p.m., there will be a presentation by the agencies, followed by a question and answer session and an opportunity to provide written and/or verbal comments.

A court reporter will record public comments received and will prepare a transcript of the public meetings. Transcripts from all four public meetings will be available to the public in the Administrative Record Section of the INEEL Information Repositories listed on Page 4.

To request a briefing with project managers, call the INEEL Community Relations Plan Office at (208) 526-4700 or the INEEL's toll-free number at (800) 708-2680.

Idaho Falls
Monday, November 16
Shilo Inn

Twin Falls
Tuesday, November 17
Shilo Inn

Boise
Wednesday, November 18
Doubletree Downtown

Moscow
Thursday, November 19
Best Western University Inn

What's Your Opinion?

This space is provided for additional comments that may not fit on the following pages. Please attach and return them together.

Comments:

Comments continued. Attach additional pages if necessary.

Fold Here, Please Use Only Clear Tape to Seal

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST-CLASS MAIL PERMIT NO. 49 IDAHO FALLS, IDAHO

POSTAGE WILL BE PAID BY ADDRESSEE

JERRY LYLE
OFFICE OF PROGRAM EXECUTION
DOE IDAHO OPERATIONS OFFICE
PO BOX 2047
IDAHO FALLS IDAHO 83403-9901

Please Return This Form by December 22nd!

What's Your Opinion?

The agencies want and need to hear from you to effectively decide what actions to take at the Idaho Chemical Processing Plant.*

Comments:

(Continued on reverse)

* *If you want a copy of the Record of Decision and Responsiveness Summary, make sure your mailing label is correct.*

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

Address Service Requested

FIRST CLASS
U.S. POSTAGE
PAID
IDAHO FALLS, ID
PERMIT 73