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Emergency and
Remedial Response

EPA/ROD/R10-92/046
September 1992

EPA

Superfund Record of Decision:

US DOE Idaho National Engineering Lab (Operable Unit 22), ID

NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

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REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R10-92/046	2.	3. Recipient's Accession No.
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15. Supplementary Notes

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16. Abstract (Limit: 200 words)

The 890-square mile Idaho National Engineering Laboratory (INEL), located 32 miles west of Idaho Falls, Idaho, is operated by the U.S. Department of Energy. Land use in the area is predominantly industrial and mixed use. The site overlies a sole source Class I aquifer, known as the Snake River Plain Aquifer. Within INEL, an area known as the Power Burst Facility (PBF) operated from 1972 to 1985 and supported the testing of pressurized-water fuel rods under hypothetical reactor accidents. This area contained several site features, including a corrosive waste sump, an evaporation pond, and discharge pipe. From 1978 to 1984, water containing a chromium-based algal and corrosion inhibitor from the PBF reactor's secondary coolant system was discharged from the corrosive waste sump (CWS) via a discharge pipe to an evaporation pond. To prevent discharge of toxic hexavalent chromium to the sump, cooling water was treated in the discharge pipe by bubbling sulfur dioxide through it to reduce the hexavalent chromium to less toxic trivalent chromium, and the treated water was discharged to the sump and neutralized using sodium hydroxide or sulfuric acid. As a result of these activities, approximately 363 cubic yards of sediment in the evaporation pond have been

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - US DOE Idaho National Engineering Laboratory (Operable Unit 22), ID
Fourth Remedial Action - Subsequent to follow
Contaminated Media: sediment, sludge, debris
Key Contaminants: metals (chromium), radioactive materials

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 34
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(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

EPA/ROD/R10-92/046
US DOE Idaho National Engineering Laboratory
(Operable Unit 22), ID
Fourth Remedial Action - Subsequent to follow

Abstract (Continued)

contaminated by metals and radioactive materials. In 1987, the pond and sump were listed as RCRA land disposal units; however, wastewater exhibiting the toxicity characteristic (TC) for chromium is believed to have been discharged after the effective date of the TC rule. The INEL site is currently divided into 10 Waste Area Groups (WAGs). Three previous RODs signed in 1991 and 1992 addressed interim remedies for the warm waste pond sediment in WAG 2, unexploded ordnance and contaminated soil in WAG 10, and ground water contamination from the TS-05 injection well in WAG 1, respectively. This ROD provides an interim remedy for the contaminated sediment and sludge in the evaporation pond, discharge pipe, and waste sump as OU22 in WAG 5. A future ROD will address the underlying aquifer and unsaturated zone. The primary contaminants of concern affecting the sediment, debris, and sludge are metals, including chromium; and radioactive materials.

The selected interim remedial action for this site includes removing and solidifying/stabilizing the 100 cubic yards of contaminated sediment from the evaporation pond by grouting, followed by onsite disposal in the Radioactive Waste Management Complex (RWMC) at INEL along with existing low-level waste containers; removing sludge and sediment from the waste sump; treating the sludge by grouting, if feasible, based on the results of treatability studies, and disposing of the treated sludge onsite in RWMC; decontaminating the discharge pipe; and sampling the remaining sediment to verify residual contaminant concentrations. The estimated total cost for this remedial action is $480,000. No O&M costs were provided for this remedial action.

PERFORMANCE STANDARDS OR GOALS:

Sediment and sludge excavation goals are based on a site-specific residential use scenario for a population that begins residence at the site within 100 years in the future. Chemical-specific goals include chromium 800 mg/kg and cesium-137 30 pCi/g.

Power Burst Facility Corrosive Waste Sump and Evaporation Pond

Operable Unit 5-13
Waste Area Group 5
Idaho National Engineering Laboratory
Idaho Falls, Idaho

DECLARATION OF THE RECORD OF DECISION

Site Name and Location

Power Burst Facility Corrosive Waste Sump and Evaporation Pond
Operable Unit 5-13
Waste Area Group 5
Idaho National Engineering Laboratory
Idaho Falls, Idaho

Statement of Basis and Purpose

This decision document presents the selected interim remedial action for the Power Burst Facility (PBF) Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory (INEL), Operable Unit (OU) 5-13. This alternative was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act, and to the extent practicable the National Oil and Hazardous Substances Pollution Contingency Plan. This decision is based on information in the Administrative Record for the site, which is located in the INEL Technical Library, 1776 Science Center Drive, Idaho Falls, Idaho.

The lead agency in this decision is the U.S. Department of Energy. The U.S. Environmental Protection Agency approves of this decision and, along with the Idaho Department of Health and Welfare (IDHW), has participated in the evaluation of the interim action alternatives. The IDHW concurs with the selected remedy.

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to human health and welfare or the environment due to the presence of chromium in the Evaporation Pond sediments.

Description of the Selected Remedy

This ROD for OU 5-13 addresses the contamination of the sediments of the Evaporation Pond and the sludge and sediment contained within the Corrosive Waste Sump and discharge pipe at the PBF. This interim remedial action involves:

- The removal of the identified areas of high contaminant concentration in the Evaporation Pond
- Stabilization of contaminated material from the pond by grouting and disposal at the Radioactive Waste Management Complex (RWMC) at the INEL
- Removal of the sludge and sediment present within the Corrosive Waste Sump

- Treatment of materials and sediments removed from the sump by grouting, if feasible based on treatability studies, and disposal at the RWMC.

Removing the areas of high contaminant concentration reduces the potential risk to human health by reducing the potential for exposure to chromium by inhalation and cesium-137 by direct ionizing radiation. Cleanup levels which have been determined to be protective of human health for this remedial action are 800 mg/kg for total chromium and 30 pCi/g for cesium-137. Cesium-137 does not present an unacceptable risk, but will be used as an indicator for chromium during the interim action. All contaminant concentrations above these levels will be removed from the pond.

Declaration

This interim action is protective of human health and the environment. It complies with federal and state applicable or relevant and appropriate requirements directly associated with this interim action and is cost-effective. This interim action is not intended to fully address the statutory mandate for permanence and treatment to the maximum extent practicable. It does, however, use treatment, and is in furtherance of that mandate by utilizing permanent solutions and alternative treatment technology to the maximum extent practicable given the limited scope of this action. As mandated by CERCLA, a review will be conducted within 5 yrs to assess the risk remaining at the site.

Because this action may not constitute the final remedy for the Evaporation Pond, Corrosive Waste Sump, and discharge pipe, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as the principal element will be addressed at the time of the final response action. Subsequent actions may be necessary to fully address the principal threats posed by the site. Because the interim remedy will result in some contaminants remaining onsite, the effectiveness of the interim action as a final action will be evaluated in the Waste Area Group 5 Comprehensive Remedial Investigation/Feasibility Study (OU 5-12), scheduled to begin in 1996.

Signature sheet for the foregoing Record of Decision for Operable Unit 5-13 interim action at the Idaho National Engineering Laboratory between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare. The Operable Unit 5-13 interim action consists of cleanup of the Power Burst Facility Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory.

Augustine A. Pitrolo
Manager
Department of Energy Idaho Field Office

9/29/92
Date

Signature sheet for the foregoing Record of Decision for Operable Unit 5-13 interim action at the Idaho National Engineering Laboratory between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare. The Operable Unit 5-13 interim action consists of cleanup of the Power Burst Facility Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory.

Dana A Rasmussen 9/30/92

Dana Rasmussen Date
Regional Administrator, Region 10
Environmental Protection Agency

Signature sheet for the foregoing Record of Decision for Operable Unit 5-13 interim action at the Idaho National Engineering Laboratory between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Idaho Department of Health and Welfare. The Operable Unit 5-13 interim action consists of cleanup of the Power Burst Facility Evaporation Pond, Corrosive Waste Sump, and discharge pipe at the Idaho National Engineering Laboratory.

Richard P. Donovan

Richard Donovan
Director
Idaho Department of Health and Welfare

9/30/92
Date

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ACRONYMS

ARARs	applicable or relevant and appropriate requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COCA	Consent Order and Compliance Agreement
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FFA/CO	Federal Facility Agreement and Consent Order
FR	Federal Register
HWMA	Hazardous Waste Management Act - State of Idaho
IDHW	Idaho Department of Health and Welfare
INEL	Idaho National Engineering Laboratory
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NESHAP	National Emission Standards for Hazardous Air Pollutants
NPL	National Priorities List
OU	Operable Unit
PBF	Power Burst Facility
pCi/g	picocuries per gram
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RWMC	Radioactive Waste Management Complex
SARA	Superfund Amendments and Reauthorization Act
TRA	Test Reactor Area
WAG	Waste Area Group

DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

The Idaho National Engineering Laboratory (INEL) is located in southeastern Idaho on the northeast portion of the Eastern Snake River Plain and encompasses approximately 890 square miles of desert. The closest major community is Idaho Falls (population 46,000), located 42 miles southeast of the INEL. The Power Burst Facility (PBF) is located in the south-central portion of the INEL (Figure 1). This Record of Decision (ROD) documents the interim action decision for the PBF Evaporation Pond, Corrosive Waste Sump, and discharge pipe [Operable Unit (OU) 5-13], which are located within the PBF area, east of the Reactor Building (PBF-620) (Figure 2).

The PBF Corrosive Waste Sump is an unlined concrete structure that was used during the neutralization of spent reactor secondary coolant water prior to discharge to the Evaporation Pond. The Corrosive Waste Sump dimensions are 11 x 11 x 21 ft deep. The sump walls are 12 in. thick, and the floor is 15 in. thick. The discharge pipe (approximately 6 in. in diameter) that leads from the Corrosive Waste Sump to the Evaporation Pond may also be contaminated.

The PBF Evaporation Pond is a 140- x 140-ft lined surface impoundment enclosed by a 6-ft high cyclone fence. The pond is used to receive reactor secondary cooling water from the PBF reactor following neutralization in the Corrosive Waste Sump. The Evaporation Pond was constructed in 1978 by borrowing native soil from a source located east of the pond. This material was used to form a 4.5-ft high berm containing a Hypalon liner, which was covered by 6 in. of sediments for protection.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The PBF reactor, which operated from 1972 to 1985, was built to support the Thermal Fuel Behavior Program's testing of pressurized-water reactor fuel rods under hypothetical reactor accidents. The discharge from the regeneration of the demineralizers and secondary coolant system waste was released to the Corrosive Waste Injection Well (OU 5-08) from 1972 to 1978. From 1978 to 1984, water containing a chromium-based algal and corrosion inhibitor from the PBF reactor's secondary coolant system was discharged into the Evaporation Pond via the Corrosive Waste Sump, along with discharges associated with the regeneration of demineralizers. In 1984, a phosphate-based corrosion inhibitor replaced the chromium-based inhibitor, thereby eliminating further discharge of chromium.

The Corrosive Waste Sump and discharge piping from the Waste Sump to the Evaporation Pond are part of a system whose prime function was to transfer secondary coolant water from the PBF secondary coolant system to the Evaporation Pond. The secondary coolant system was drained 2 to 4 times per yr when the reactor was operational. To prevent discharge of toxic hexavalent chromium to the Corrosive Waste Sump, the secondary coolant water was treated by bubbling sulfur dioxide through it to reduce the hexavalent chromium to less toxic trivalent chromium. The coolant was discharged to the Corrosive Waste Sump, where the liquid was neutralized using sodium hydroxide or sulfuric acid. The pH of the sump effluent was monitored for only a short period in late 1984 and was normally between 6.5 and 7.0. Because the process did not change, these results are assumed to be representative of all effluent discharged through the sump.

The Corrosive Waste Sump also received water from the demineralizer system. The demineralizer system contains ion exchange resin columns that were used for purifying primary and

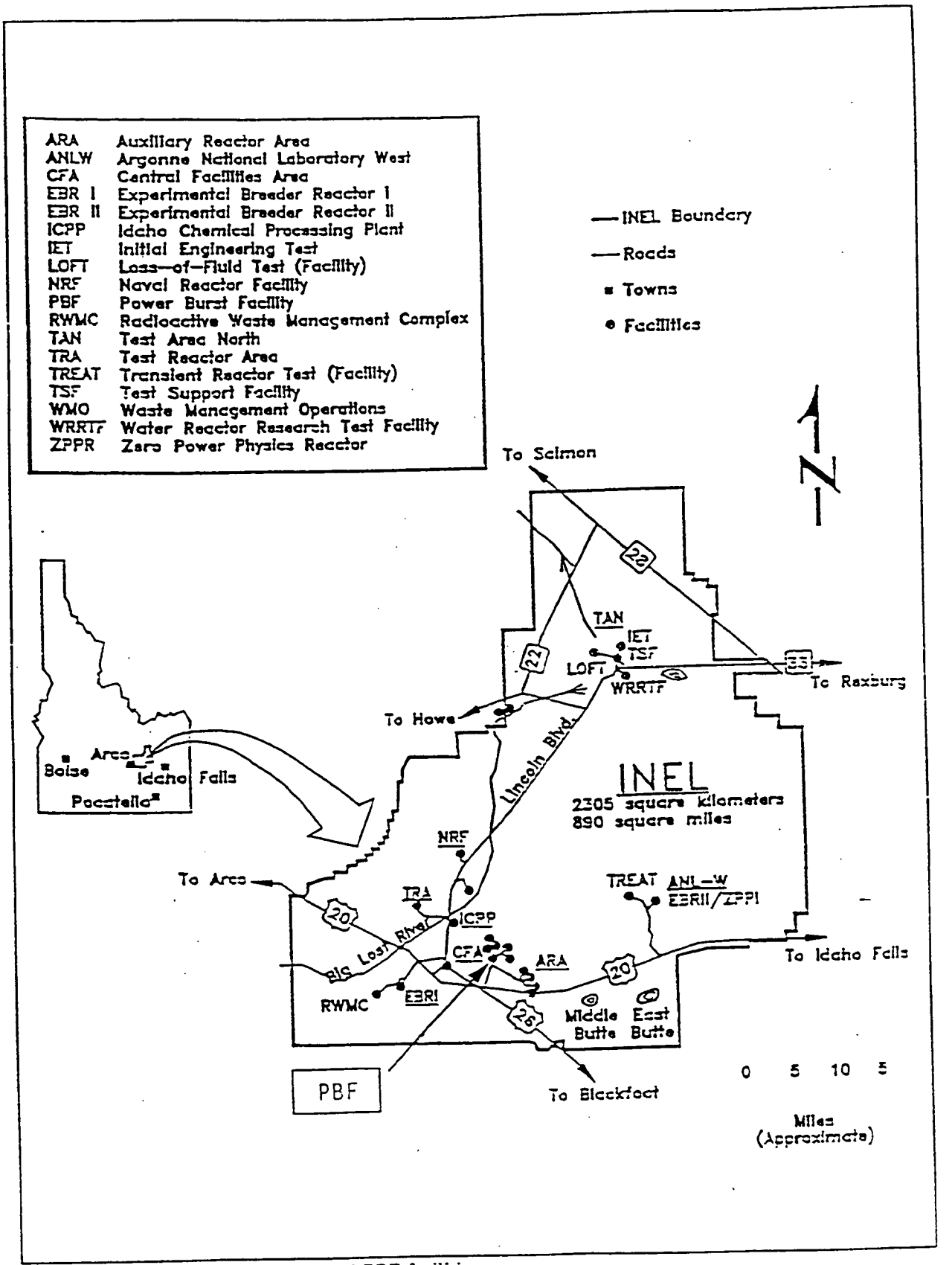

Figure 1. Location of the INEL and PBF facilities.

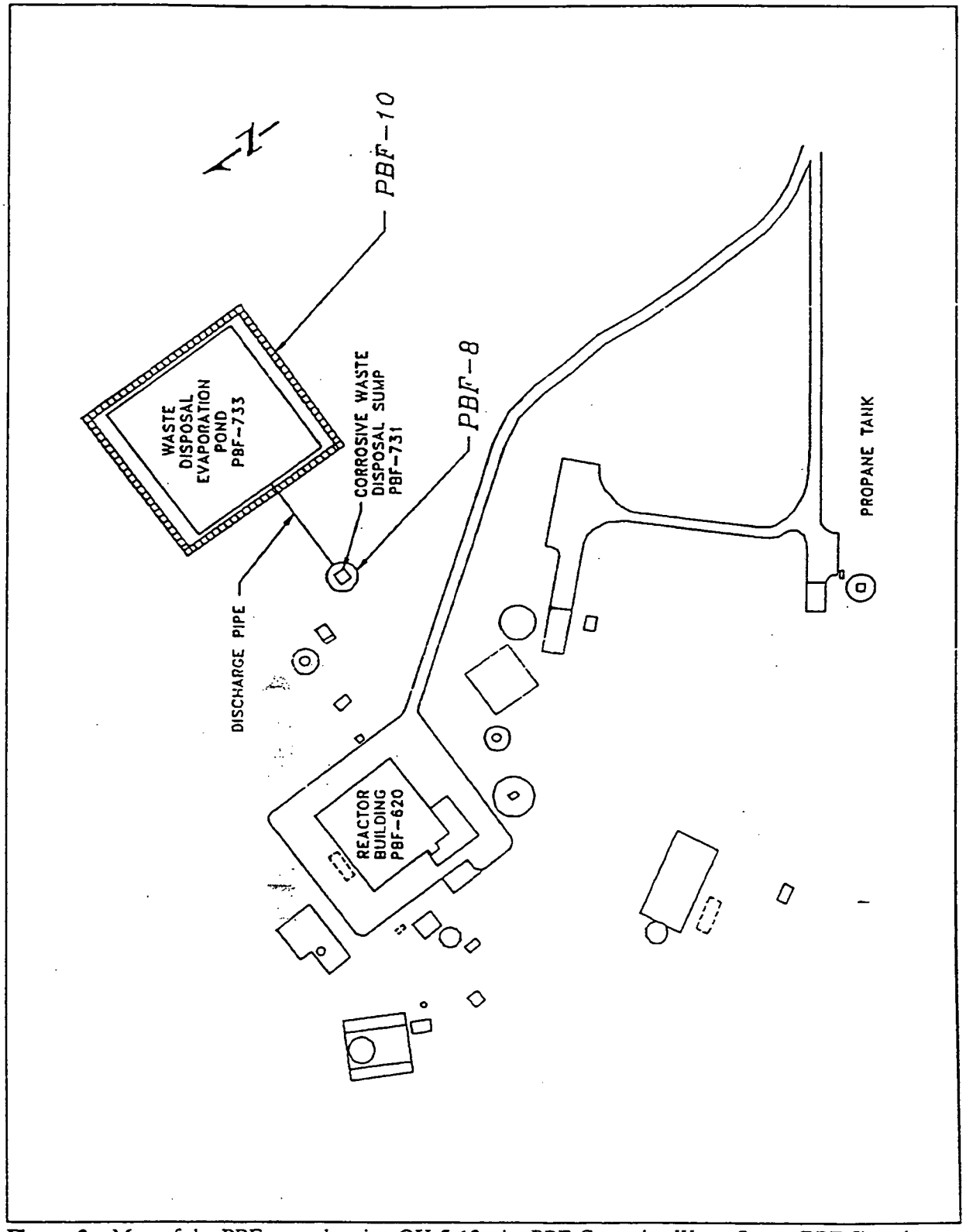

Figure 2. Map of the PBF area showing OU 5-13: the PBF Corrosive Waste Sump (PBF-8) and Evaporation Pond (PBF-10).

secondary reactor cooling water and for treatment of wastewater. After the majority of the exchange capacity is used, the resin, which is in the form of beads, is regenerated.

During regeneration of the resin columns, backflushing operations allowed some resin beads to flow to the Corrosive Waste Sump and then to the Evaporation Pond. Because ion exchange resin beads selectively bind to metal ions such as chromium and cesium-137, the highest concentrations of chromium and cesium-137 would most likely occur in areas of the pond where the resin beads accumulate. Results from sampling done in 1989 support the concept that chromium and cesium-137 are associated as mentioned above.

As a result of the evaporation of secondary coolant water discharged to the pond, chromium and cesium-137 contamination is found in the 9,800 cubic feet (363 cubic yards) of sediments located on top of the Hypalon liner. The INEL's waste management records indicate, on the average, a total of 33 lb/yr trivalent chromium was discharged to the Evaporation Pond. There is no leak detection system under the liner, and no samples have been collected from beneath the liner to determine if leakage and subsequent contamination of the sediments beneath the liner have occurred. However, the pond does retain water, which has been introduced to control the emission of particulate material.

The PBF Evaporation Pond sediments have been sampled several times. In 1988, six random grab samples were collected from the Evaporation Pond. Chemical analyses were performed to quantify the types and concentrations of metals, volatile organics, semi-volatiles, pesticides, and polychlorinated biphenyls present. In September 1989, six biased grab samples were collected from the Evaporation Pond and analyzed for the presence of gamma-emitting radionuclides. A combination of biased and systematic random samples (a total of 20 samples) were collected to characterize the pond and sump contents in November of 1989. The laboratory data from these sampling efforts and the preliminary risk evaluation based on those data, provide the basis for this interim action.

The release of radioactive or hazardous contaminants to the Evaporation Pond was identified and evaluated during investigations conducted in accordance with the Resource Conservation and Recovery Act (RCRA) Corrective Action Requirements of the July 1987 Consent Order and Compliance Agreement (COCA) signed by the U.S. Environmental Protection Agency (EPA), U.S. Department of Energy (DOE), and U.S. Geological Survey. The sump and pond were listed as COCA units PBF-08 and PBF-10, respectively, in that agreement.

Under the COCA, the pond and sump were listed as RCRA Land Disposal Units because there was information indicating wastewater exhibiting the toxicity characteristics for chromium was discharged to the pond after the effective date of the relevant RCRA regulations. These units have since been incorporated into the Federal Facility Agreement and Consent Order (FFA/CO) and are being addressed under the CERCLA process. The 1989 EP Toxicity tests show Evaporation Pond sediments do not exhibit the toxicity characteristic for chromium, and therefore are not RCRA hazardous. The material in the Corrosive Waste Sump has not been subjected to toxicity characteristic leach test. However, much lower concentrations of contaminants were detected in the waste sump. These low concentrations in a medium consisting mostly of resin beads, which aggressively binds chromium and other metal ions, indicates that the sump materials are not RCRA hazardous waste. Consistent with the FFA/CO Action Plan, Section 1.3.1, the final action for this OU will meet the applicable substantive requirements of RCRA/Hazardous Waste Management Act - State of Idaho (HWMA) in the event an unacceptable risk to human health and the environment is demonstrated.

The INEL was proposed for listing on the National Priorities List (NPL) in the *Federal Register* (*FR*) on July 14, 1989 (54 *FR* 29820). The listing was proposed by the EPA under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980

(CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The final rule, which listed the INEL on the NPL, was published on November 21, 1989, in 54 *FR* 44184.

In December 1991, the EPA, DOE, and Idaho Department of Health and Welfare (IDHW) signed the FFA/CO that superseded the COCA. This agreement provides the process and schedule to facilitate cleanup of the areas identified in the FFA/CO Action Plan, in accordance with CERCLA, RCRA, and HWMA.

The FFA/CO lists OU 5-13 as an interim action requiring investigation and/or remediation. This ROD documents the decision to perform an interim action on OU 5-13 and the remedy selected. The OU 5-13 interim action will be evaluated for adequacy as a final remedial action in the Waste Area Group (WAG) 5 Comprehensive Remedial Investigation/Feasibility Study (RI/FS), which is scheduled to begin in 1996.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

In accordance with CERCLA, sections 113(k)(2)(B)(i-v) and 117, the public was given the opportunity to participate in the remedy selection process. In accordance with CERCLA, section 113(k)(1), an Administrative Record was established to provide the basis for the selection of the remedial action. The Notice of Availability for the Proposed Plan was published in the *Post Register* (Idaho Falls), *Idaho State Journal* (Pocatello), and *Times News* (Twin Falls) on April 3, 1992; in the *Idaho Statesman* (Boise) and *Daily News* (Moscow) on March 21; and in the *South Idaho Press* (Burley) on March 27 and April 3.

Public involvement opportunities for the PBF OU 5-13 Interim Action were announced via the *INEL News* newsletter, which is distributed to approximately 14,000 members of the general public. Newspaper and radio advertisements and an INEL press release were utilized to inform the public of this proposed action. Personal phone calls were made to key individuals, environmental groups, and organizations by the INEL outreach offices in Pocatello, Twin Falls, and Boise and by the Community Relations office in Idaho Falls. The Proposed Plan for the interim action for the PBF Evaporation Pond and the PBF Corrosive Waste Sump was mailed to the public on March 19, 1992. The Proposed Plan was mailed to approximately 6,500 individuals on the INEL mailing list with a cover letter from the Director of the Environmental Restoration Division of the DOE, Field Office Idaho, urging citizens to comment on the Proposed Plan and to attend public meetings. Copies of the Proposed Plan and the Administrative Record are available to the public in six regional INEL information repositories: the INEL Technical Library in Idaho Falls; and city libraries in Idaho Falls, Pocatello, Twin Falls, and Boise; and the University of Idaho Library in Moscow. The city library in Moscow originally received the material, but the material has since been moved to the University of Idaho Library. Copies of the Administrative Record file for the PBF Evaporation Pond and Corrosive Waste Sump Interim Action were placed in the information repositories sections or at the reference desk in each of the libraries on March 19, 1992.

The public comment period was initially scheduled from March 25 to April 24, 1992. Two public meetings were held on April 8 and 9, 1992, in Idaho Falls and Burley, respectively. Representatives from the DOE, IDHW, and EG&G Idaho, were present to discuss the Proposed Plan, answer questions, and receive public comment. The EPA was available via teleconference to assist in answering questions and receiving comments. Verbatim transcripts were prepared by a court reporter at each public meeting. Written comment forms were also available at each meeting. A telephone technical briefing was held for the League of Women Voters and other citizens of Moscow on May 7, 1992, at the University of Idaho Education Building.

During the initial comment period a written request was received for an extension, and the public comment period was extended an additional 30 days, to May 24. The reason for the requested extension was the delay in some of the public receiving the Proposed Plan due to mailing problems. The extension announcement was made in the *Post Register* on April 24, the *Idaho State Journal* on April 26, the *Times News* on April 26, the *Idaho Statesman* on April 27, the *Daily News* on April 24, the *South Idaho Press* on April 24, and the *Morning Tribune* (Lewiston) on April 26.

All verbal comments given at the public meetings and all submitted written comments are recorded verbatim in the Administrative Record for the ROD. Responses to the public comments received during the public comment period are included in the Responsiveness Summary (Appendix A) and were considered during the development of this ROD. Public comments on the Proposed Plan are annotated to indicate which response in the Responsiveness Summary addresses each comment. The information used as the basis of the decision for this interim action is included in the Administrative Record.

Predominant public opinions on the preferred alternative, as described in the Proposed Plan, are that any potentially contaminated sediments beneath the pond should be removed, in addition to removal of all the sediments within the pond and the liner itself. Others who believe the risk to human health and the environment is minimal, suggested the "No Action" alternative should be implemented.

4. SCOPE AND ROLE OF OPERABLE UNIT AND RESPONSE ACTION

To better manage the investigations needed to determine appropriate remedial actions, the INEL has been divided into 10 WAGs. Within each WAG, known or suspected areas of contamination are assigned to an OU as a means of managing and controlling investigation and cleanup activity. This strategy allows the EPA, IDHW, and DOE to focus available cleanup resources on those areas that could potentially pose a risk to human health and the environment. WAG 5 consists of the PBF and the Auxiliary Reactor Area. The PBF Evaporation Pond sediments, Corrosive Waste Sump, and connecting discharge pipe are identified as OU 5-13. The underlying aquifer and unsaturated zone are not included in this OU but will be addressed in a subsequent investigation.

Existing characterization data were available to identify OU 5-13 as a risk to human health and the environment due to the presence of chromium and to support selection of a remedial technology. This interim action is intended to reduce immediate unacceptable risks associated with the Evaporation Pond sediments and to remove and dispose of the contaminants contained in the Corrosive Waste Sump to expedite overall INEL cleanup. On the basis of the characterization data available in the Administrative Record for the sediments of the PBF Evaporation Pond, an immediate unacceptable risk to human health has been identified due to potential receptor inhalation of chromium. No exposure pathway exists that poses an unacceptable risk to human health and the environment from contaminants contained within the Corrosive Waste Sump and discharge pipe. However, the pipe and sump are being cleaned up under this action to eliminate a potential future source of contamination to the pond sediments. The interim action will not be inconsistent with any known future CERCLA actions.

As mandated by CERCLA, a review will be conducted within 5 yrs to reassess potential risk from this OU. This review will only consider the effectiveness of the protective measures employed, by an evaluation of actions and verification data to date. The interim action will be evaluated for adequacy as a final remedial action as part of the WAG 5 Comprehensive RI/FS (OU 5-12), scheduled to begin in 1996.

5. SUMMARY OF SITE CHARACTERISTICS

To more definitively characterize materials contained within the PBF Evaporation Pond and Corrosive Waste Sump, biased and random sediment samples were collected in 1989 and documented in the *Closure Plan for the Power Burst Facility Corrosive Waste Sump and the Power Burst Facility Evaporation Pond (COCA units PBF-08 and PBF-10)*, EGG-WM-8996, May 1990. The regulatory status was changed from RCRA to CERCLA in 1991 by the signing of the FFA/CO. Data from samples collected in 1989 were used to support CERCLA site characterization. Analyses for the presence of gamma-emitting radionuclides and metals were performed on the samples collected from the Evaporation Pond sediments (Table 1). Chromium (total) and cesium-137 were the contaminants of concern identified in the toxicity screen performed on the Evaporation Pond sediments. Average total chromium concentration of the random samples in the PBF Pond is 500 mg/kg, with the maximum concentration (3,439 mg/kg) of total chromium occurring in a biased sample located near the pond inlet. Because hexavalent chromium was chemically reduced prior to discharge, all the chromium in the sump and pond is assumed to be trivalent chromium. The highest concentration of cesium-137 (325 pCi/g) was from a biased sample near the pond inlet, with an average of 20.3 pCi/g from all random samples collected throughout the pond. Figure 3 is a diagram of the PBF Evaporation Pond, indicating sample locations and contaminant concentrations.

In addition to sampling the waste disposal areas, undisturbed areas upwind of the Corrosive Waste Sump and the Evaporation Pond were sampled to characterize background metal levels. The purpose of the background samples was to have a point of comparison for the samples collected in the pond. Background samples indicated the surrounding soils have a mean total chromium concentration of 21 mg/kg, which is attributable to natural occurring chromium. These background samples were well within the range of background chromium concentrations reported at other locations on the INEL.

The results of the PBF Corrosive Waste Sump sampling indicated the presence of low-level radioactivity (6.97 to 7.86 pCi/g of cesium-137). In addition, compounds found only in the sump were the volatile organic compounds 4-methyl-2-pentanone (150.0 to 170.0 μg/kg), ethylbenzene (5.0 to 16.0 μg/kg), and xylene (32.0 to 100.0 μg/kg).

6. SUMMARY OF SITE RISKS

6.1 Human Health Risk

A preliminary risk evaluation was performed in accordance with EPA guidance to determine the risks to human health posed by contaminants identified in the Evaporation Pond sediments, and is available in the Administrative Record. The contaminants identified in the sump (a closed concrete vault) were not considered for this preliminary evaluation because it is unlikely these contaminants have a pathway to receptors (since the contaminants are contained) and because of the small volume of waste material in the sump. However, the sump and discharge pipe materials are to be removed to eliminate future contamination of the pond sediments.

In the preliminary risk evaluation, the potential for carcinogenic and noncarcinogenic toxic effects was computed using EPA default parameters and methods found in the *Risk Assessment Guidance for Superfund*, Volume I, "Human Health Evaluation Manual." The default model parameters may be more conservative than site-specific parameters but are routinely applied.

Occupational and future residential scenarios were examined to assess the risks to humans from exposure to the contaminants in the Evaporation Pond sediments. The pathways by which workers or future residents could be potentially exposed to the contaminants within the pond were identified as inhalation, ingestion, direct contact, and direct radiation. The risks from the groundwater pathway were not included in this risk evaluation because OU 5-13 is confined to the sediments overlying the Hypalon liner. The aquifer and unsaturated zone in this area will be evaluated in another investigation within WAG 5.

Of the four exposure pathways identified, inhalation of fugitive dust and direct exposure to ionizing radiation were the greatest contributors to risk. The inhalation pathway of chromium presented an excessive hazard quotient, and direct exposure to ionizing radiation contributed to an excess in the incidence of cancer. For both of these pathways, future residential risk was the highest. The future residential use scenario is based on an individual beginning future residence at the pond site 100 yrs in the future. One hundreds yrs was agreed to by the three agencies involved for use in evaluating future residential scenarios.

For present day workers (occupational) and future residents, the risk due to the inhalation of existing levels of chromium-contaminated dust were both calculated and found to exceed the EPA hazard quotient of 1 (Table 2). This result implies sensitive sub-populations may exhibit adverse health effects due to their exposure to fugitive dust emissions from the pond.

Additionally, exposure to direct ionizing radiation, due to the presence of cesium-137, was found to be within the acceptable risk range defined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) as 10^{-4} to 10^{-6} for occupational and residential populations. The calculated value for present day workers is 8 additional cancer incidences in 100,000 exposed workers, and for future residents the calculated value for excess cancer incidences is 4 additional incidences of cancer per 10,000 exposed individuals residing near the pond 100 yrs in the future. The NCP, 40 CFR 300.430, establishes the point of departure for determining remedial goals as 1 in 1,000,000 (10^{-6}) for carcinogens. For cesium-137, a 10^{-6} risk corresponds to a concentration of 0.66 pCi/g.

Cleanup goals for the PBF Evaporation Pond sediments are based on a site-specific residential use scenario for a population that begins residence at the site 100 yrs in the future. This scenario results in the calculation of a conservative cleanup level protective of current occupational and future residential populations at the PBF. The cleanup goal for chromium is 800 mg/kg. This level was established using equations from the *Risk Assessment Guidance for Superfund*, Part A (EPA 1989), and site-specific exposure parameters for the residential use scenario. An inhalation rate of 20 cubic meters/d, exposure time of 350 d/yr, and a PM-10 fraction (particles of less than 10 microns) of 12.5% of the total suspended particulates were used in these calculations (*Rapid Assessment of the Exposure to Particulate Emissions from Surface Contamination Sites*, EPA/600/8-85/002, February 1985). The chromium cleanup level of 800 mg/kg results in a hazard quotient below the EPA's threshold hazard quotient and protects sensitive individuals and sub-populations from adverse health effects.

The cesium-137 cleanup goal of 30 pCi/g will ensure the high concentrations of chromium are also removed. Radioactive decay of the cesium-137, will result in a concentration of 3 pCi/g at the site 100 yrs in the future. This corresponds to an excess cancer risk of 5×10^{-5} at the site 100 yrs in the future. These cleanup levels were calculated using EPA-approved methods (Part B of the *Risk Assessment Guidance*).

The presence of high concentrations of chromium is the primary risk driver for this interim action. Although the risk of exposure to cesium-137 is within the acceptable risk range, these risks

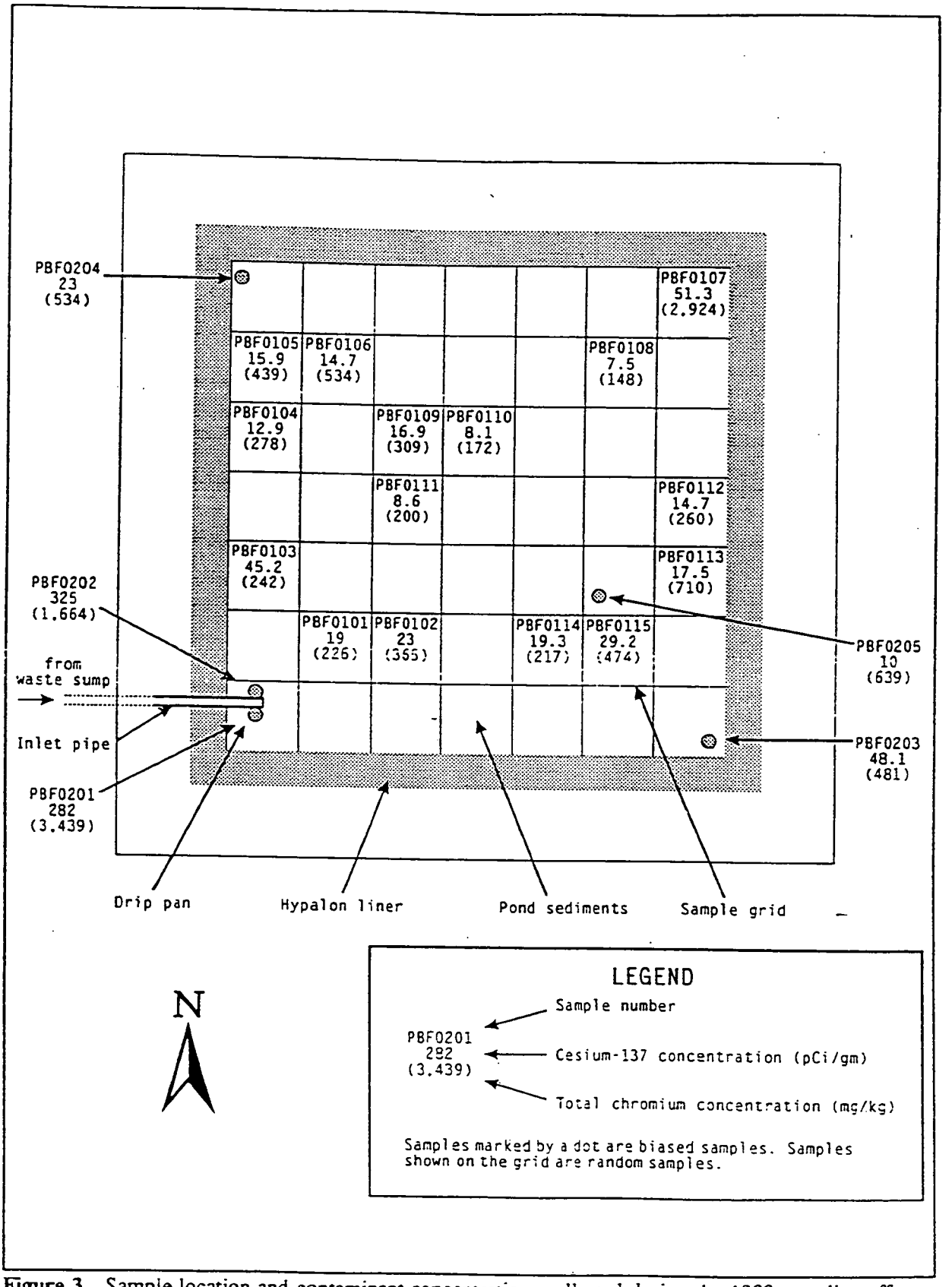

Figure 3. Sample location and contaminant concentrations collected during the 1989 sampling effort at the PBF Evaporation Pond.

Table 1. Cesium-137 and chromium concentrations found in PBF Evaporation Pond samples.

Sample No.	Sample Location	Cesium-137 pCi/g	Chromium (mg/kg)	Sediment Depth cm (ft)
PBF0101M	Random	19.0	226	12.2 (0.40)
PBF0102M	Random	23.0	365	11.6 (0.38)
PBF0103M	Random	45.2	242	13.4 (0.44)
PBF0104M	Random	12.9	278	14.0 (0.46)
PBF0105M	Random	15.9	439	14.0 (0.46)
PBF0106M	Random	14.7	534	13.1 (0.43)
PBF0107M	Random	51.3	2924	12.8 (0.42)
PBF0108M	Random	7.5	148	14.9 (0.49)
PBF0109M	Random	16.9	309	9.5 (0.31)
PBF0110M	Random	8.1	172	12.8 (0.42)
PBF0111M	Random	8.6	200	12.2 (0.33)
PBF0112M	Random	14.7	260	11.9 (0.39)
PBF0113M	Random	17.5	710	15.2 (0.50)
PBF0114M	Random	19.3	217	10.1 (0.33)
PBF0115M	Random	29.2	474	11.7 (0.39)
Random Sample Average		20.3	500	12.5 (0.41)
PBF0201M	Biased	282.0	3439	8.5 (0.28)
PBF0202M	Biased	325.0	1664	9.8 (0.32)
PBF0203M	Biased	48.1	481	20.1 (0.66)
PBF0204M	Biased	23.0	534	20.4 (0.67)
PBF0205M	Biased	10.0	639	16.2 (0.53)
Average of all Samples		50.0	713	13.2 (0.43)

will also be reduced by removal of the contaminated sediments. The presence of cesium-137 will be used as an indicator for the presence of chromium.

Based on 1989 sampling results, cesium-137 and total chromium concentrations display a strong spatial correlation. Figure 4 shows the spatial relationship of the two contaminants. Removing areas of high concentrations of contaminants is predicated on the observed spatial correlation between the cesium-137 and the chromium. Cleanup of higher radioactive areas, as detected by field instrumentation, will indicate a reduction in the concentration of both contaminants of concern. When the cleanup goal of 30 pCi/g for cesium-137 is attained, the cleanup goal of 800 mg/kg for total chromium is assumed to be attained also. To confirm the effectiveness of the cleanup, sampling of the remaining sediments will be performed to verify residual concentrations of cesium-137 and total chromium are at or below established cleanup levels.

6.2 Ecological Concerns

An ecological risk assessment was not performed for this interim action. Because the interim risk evaluation methodology is conservative and the major ecological exposure routes are expected to be the same as for human exposures, the risk reduction realized due to this interim action should also achieve a significant reduction in adverse ecological effects. An ecological assessment will be performed as part of the INEL-wide Comprehensive RI/FS scheduled to begin in 1998.

6.3 Basis for Response

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to human health or the environment due to the presence of chromium in the Evaporation Pond sediments.

7. DESCRIPTION OF ALTERNATIVES

Consistent with NCP and EPA guidance, a limited number of alternatives were evaluated for this interim action. A summary of the alternatives and controls for each alternative is provided below.

7.1 Alternative 1: No Action

If the No Action alternative is implemented, the OU would remain in its current state. This alternative does not further restrict access to the site or restrict the pathways through which the contaminants may be transported. The No Action alternative was evaluated to determine if it is a viable alternative as required by the NCP (40 CFR 300.430). No additional costs or implementation time is involved with this alternative.

7.2 Alternative 2: Removal of Areas of High Contaminant Concentration

There is a strong correlation between areas of higher radioactivity (relative to the pond) and elevated levels of chromium in the pond sediments as demonstrated by the 1989 sampling results (Figure 4). Removing the areas of high contaminant concentration reduces potential risk to human health. Removal options include but are not limited to, pneumatic lifting, manual extraction, or light mechanical extraction. Removal of extracted material will be handled prior to treatment such that exposure to direct ionizing radiation and emission of fugitive dust are minimized.

Table 2. Summary of risk from preliminary risk assessment for the PBF Evaporation Pond.

	Carcinogenic Risk (cesium-137)	Hazard Quotient (chromium)
Occupational	8 in 100,000 (8×10^{-5})	1.75
Future Residential (100 yr)	4 in 10,000 (4×10^{-4})	6.1

Two treatment and disposal options were proposed for the removed sediments. Option A involves treatment (separation/extraction) and disposal using the sediment washing process proposed for the Test Reactor Area (TRA) Warm Waste Pond Interim Action. Presently, treatability studies are being conducted at TRA. The major applicable or relevant and appropriate requirements (ARARs) pursuant to this option are discussed in the TRA ROD located in the Administrative Record.

Option B involves treatment (stabilization/solidification) followed by disposal at the Radioactive Waste Management Complex (RWMC). The stabilized sediments would be used to fill void spaces in existing certified low-level waste containers. Treatability studies will be conducted to determine the optimum sediment/grout/additive mixture. Major ARARs pursuant to this option are listed and discussed in Section 10.2.

During the sediment removal process, the materials located in the sump and discharge pipe will also be removed, treated, and disposed. The sump and associated discharge pipe will be decontaminated to ensure they will not be a continuing source of contamination.

8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

CERCLA guidance requires each remedial alternative be evaluated according to specific criteria. The purpose of the evaluation is to determine the advantages and disadvantages of each alternative, thereby guiding selection of the remedial alternative offering the most effective and feasible means of achieving the stated cleanup objectives. While all nine CERCLA criteria are important, they are weighted differently in the decision making process depending on whether they describe a required level of performance (threshold criteria), technical advantages and disadvantages (balancing criteria), or review and evaluation by other entities (modifying criteria). The two remedial alternatives described in Section 7 were evaluated according to the following CERCLA criteria:

- Threshold criteria
  - Overall protection of human health and the environment
  - Compliance with ARARs
- Balancing criteria
  - Long-term effectiveness and permanence
  - Reduction of toxicity, mobility, or volume through treatment

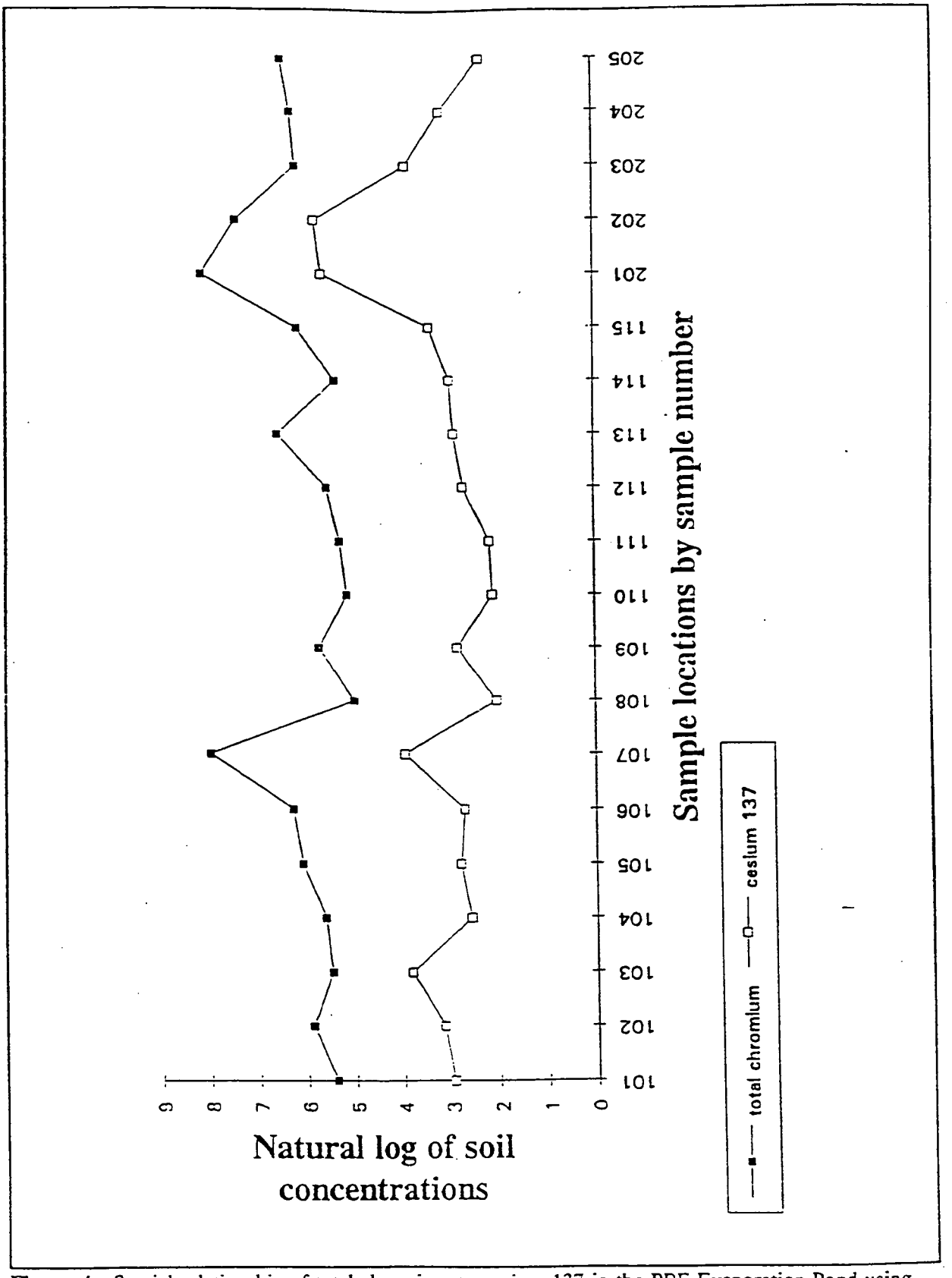

Figure 4. Spatial relationship of total chromium to cesium-137 in the PBF Evaporation Pond using log transformed data from Table 1.

- Short-term effectiveness
- Implementability
- Cost

- Modifying criteria

  - State acceptance
  - Community acceptance.

8.1 Threshold Criteria

The remedial alternatives were evaluated in relation to the two threshold criteria: overall protection of human health and the environment and compliance with ARARs. The threshold criteria must be met by the remedial alternatives for further consideration as potential remedies for the ROD. The threshold criteria must be met for a final remedial action, and this interim action is intended to meet those criteria to the maximum extent practicable. The effectiveness of this remedial action as a final remedy will be evaluated in the WAG 5 Comprehensive RI/FS.

8.1.1 Overall Protection of Human Health and the Environment

Overall protection of human health and the environment requires evaluation of how well the remedial alternatives eliminate, reduce, or control the identified risks. This overall assessment of protection of human health and the environment draws on the assessments conducted under other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. For this interim action to be successful, present unacceptable risks will be reduced and further remedial action may be unnecessary.

The No Action alternative provides no reduction in contaminant concentrations and, therefore, does not meet the protection of human health and the environment criterion. The alternative of removing areas of high contaminant concentration from within the sediments provides protection of human health and the environment by reducing the potential for exposure by inhalation of chromium to below the threshold hazard quotient of 1. As described in Section 7.2, Option A involves treatment and disposal using the sediment washing process proposed for the TRA Warm Waste Pond. Option B involves treatment (stabilization/solidification) followed by disposal at the RWMC. Both of these options, with the necessary facilities designed and constructed, would meet protective criteria.

8.1.2 Compliance with Applicable or Relevant and Appropriate Requirements

CERCLA, as amended by SARA, requires remedial actions for Superfund sites comply with federal and state substantive requirements that are applicable to the action being taken. Remedial actions must also comply with the substantive requirements of laws and regulations that are not directly applicable, but are relevant and appropriate unless waivers are granted. These are requirements that pertain to situations sufficiently similar to those encountered at a Superfund site, so their use is well suited. Combined, these are referred to as ARARs. State ARARs are limited to those requirements that are more stringent than federal counterpart requirements. Compliance with ARARs requires evaluation of the remedial alternatives for compliance with chemical-, location-, and action-specific ARARs or justification for a waiver. Compliance also requires consideration of whether the remedial alternative considers other criteria, advisories, and guidelines.

8.2 Primary Balancing Criteria

After the proposed alternatives are evaluated using the two threshold criteria, five balancing criteria are used to evaluate other aspects of the potential remedial alternatives. Each alternative is evaluated using each of the balancing criteria. The balancing criteria are used in refining the selection of the candidate alternatives for the site. The five balancing criteria are: long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost. Each criterion is further explained in the following sections. The No Action alternative did not meet the threshold criterion (protection of human health and the environment) and was not considered further.

8.2.1 Long-Term Effectiveness and Permanence

In evaluating long-term effectiveness and permanence, the magnitude of residual risks as well as the adequacy and reliability of controls must be examined. The magnitude of the remaining risks is evaluated by assessing the residual risk associated with untreated waste and the treated residual. The characteristics of the residuals should be considered to the degree that they remain hazardous, taking into account their volume, toxicity, mobility, and propensity to bioaccumulate. Adequacy and reliability of controls is evaluated by assessing the containment and/or institutional controls to determine if they are sufficient to ensure any exposure to residual risks is within protective levels.

Alternative 2, Option A (separation/extraction), reduces the risks associated with the chromium and cesium-137 in the Evaporation Pond sediments by extracting the contaminants of concern from the sediments and placing the treated residuals in a controlled environment, thereby reducing the risks associated with the Evaporation Pond sediments. The contaminated sediment could present a risk due to its radioactive content, but the material would be treated, containerized, and stored in such a way as to be directly or indirectly monitored. Final disposal would be addressed in the WAG 2 Comprehensive RI/FS.

Alternative 2, Option B (stabilization/solidification), meets the criterion for long-term effectiveness because the contaminants in the sediment are physically bound in a grout mixture, thereby reducing the residual risks associated with the Evaporation Pond sediments. The permanence of stabilization technology is unproven for the length of time needed for the highest expected concentration of cesium-137 to decay to acceptable levels consistent with the NCP. However, regardless of the performance of the grout over time, the contaminated sediments will be placed in certified low-level waste containers and disposed of in the RWMC, which is a low-level waste repository. Institutional and administrative controls are presently in place at the RWMC in accordance with the DOE Orders applicable to low-level waste storage.

8.2.2 Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion addresses the statutory preference for selecting remedial actions employing treatment technologies that permanently reduce toxicity, mobility, or volume of the hazardous substances as their principal element. Evaluating alternatives based on the reduction of toxicity, mobility, or volume through treatment requires analysis of the following factors: treatment process used, toxicity and nature of the material treated, amount of hazardous material destroyed or treated, irreversibility of the treatment, type and quantity of treatment byproducts, and statutory preference for treatment as a principal element.

The separation/extraction process (Option A) would reduce the toxicity of the sediment removed from the pond by removing the majority of the contaminants. Because the process is still in development, the total reduction in toxicity and volume is not known at the present time. The

concentrated sediment portions extracted should be more toxic than initial pond sediments because of the concentrating of contaminants. However, the small volume of highly-contaminated material left after extraction would be containerized, thereby reducing mobility of the contaminants while awaiting final disposition.

Option B, stabilization/solidification, reduces the toxicity and mobility of the contaminants of concern by dispersing the contaminants in an inert (grout/sediment) matrix. Stabilization increases the volume of contaminated material due to the addition of grout, but this interim action utilizes existing container void space to allow disposal with no net increase in the volume used in the RWMC. Therefore, waste minimization principals have been considered.

8.2.3 Short-Term Effectiveness

The evaluation of alternatives based on the short-term effectiveness requires an evaluation of the effectiveness of protection for the community and workers during remedial actions, environmental impacts during implementation, and the amount of time required for remedial action objectives to be achieved. Either option would achieve the remedial action objectives in about the same amount of time. The time required to execute the action after design is completed is not anticipated to exceed one field season. During implementation of either option of Alternative 2, protection of workers from radiation exposure would be an important element of the remedial design. Because the Evaporation Pond is currently a radioactively-controlled area, all personnel entering the area must have training for working with hazardous substances, radioactive substances, and respirators. Health physics personnel will be on site at all times when work is ongoing to monitor and control radiation exposure to personnel. Every person entering the working area at the pond will wear appropriate personal protective equipment, including a dosimeter to record the radiation received. DOE has as low as reasonably achievable radiation dose goals for personnel; these goals will be met.

By using administrative and institutional controls, either option for Alternative 2 proposed for the Evaporation Pond minimizes any short-term risk to the community from this interim action. The large distances from population centers and the strict security at the PBF prevent risks to communities during implementation of this interim action. Access by visitors and site personnel not working on the project will be restricted to those meeting INEL requirements.

8.2.4 Implementability

The implementability criterion has three factors requiring evaluation: technical feasibility, administrative feasibility, and the availability of services and materials. Technical feasibility requires an evaluation of the ability to construct and operate the technology, the reliability of the technology, the ease of undertaking additional remedial action (if necessary), and monitoring considerations.

Removal of contaminated sediments as proposed by Alternative 2, is a common approach to risk reduction. Because a small volume of material is to be removed (approximately 100 cubic yards), this approach is easily implemented. The ability to coordinate actions with other agencies is a factor for evaluating administrative feasibility and is not anticipated to be a major issue for this project. The availability of services and materials requires evaluation of treatment, storage capacity, disposal services, necessary equipment and specialists, and prospective technologies.

Implementation of the treatment and disposal options at the TRA Treatment Facility (Option A) and the RWMC (Option B) varies considerably. Implementation of treatment and disposal at TRA is dependent on developing a new application of an existing technology. If the timing of the projects does not correspond, implementing the proposed TRA treatment and disposal option will be problematic. The RWMC is an existing facility, and the equipment for grouting can be acquired and

assembled in a timely manner. The disposal of the stabilized waste will be in an existing facility. For these reasons, grouting (Option B) followed by disposal of the waste at the RWMC is the option most implementable.

8.2.5 Cost

In evaluating project costs, an estimation of capital costs, operation and maintenance costs, and present worth costs are required. Capital costs include design, construction, equipment, buildings, startup, and contingency costs. Operating and maintenance costs include labor, power, disposal of residuals, administrative, and periodic review. Actual costs are expected to be no more than 50 percent over, or 30 percent under, the cost estimate. Costs for each alternative are summarized in Table 3. Alternative 1, No Action, has no cost. The total cost for Alternative 2, Option A including sediment removal and treatment would be $557,000, while Option B total cost would be $480,000 (see Table 3).

8.3 Modifying Criteria

The modifying criteria are used in the final evaluation of remedial alternatives. The two modifying criteria are state acceptance and community acceptance. For both of these criteria, the factors considered include the elements of the alternativese supported, the elements of the alternatives not supported, and the elements of the alternatives having strong opposition.

8.3.1 State Acceptance

This assessment evaluates the technical and administrative issues and concerns the state may have regarding each of the alternatives. The IDHW concurs with the interim action because it takes the contaminants of concern from an uncontrolled environment to a controlled situation. The IDHW participated in the development of this project, including preparation of the Proposed Plan and this decision document. Comments received from the state were incorporated into these documents, which have been issued with concurrence from the IDHW.

8.3.2 Community Acceptance

The public comment period, which was held from March 25 to May 24, 1992, provided the opportunity for the public to express their opinions regarding each of the remedial alternatives. Many citizens commented on the efficacy of the preferred alternative. Some suggested the agencies should remove all the pond sediments, liner, and any potential contamination present beneath the pond liner. Other members of the public believed the risk to human health and the environment to be minimal and supported the No Action alternative. Public comments on the plan were considered during the preparation of this ROD and are responded to in the attached Responsiveness Summary.

9. SELECTED REMEDY

The DOE, EPA, and IDHW selected Alternative 2, Option B (removal of areas of high contaminant concentration and grouting of the sediments for disposal at the RWMC), as the interim action for the PBF Evaporation Pond, Corrosive Waste Sump, and discharge pipe. This alternative is preferred because it is a standard, available technology that can be readily implemented at reasonable cost. The contaminated sediments will be characterized, treated by stabilization/solidification, and disposed of at the RWMC. A treatability study will be performed to determine the optimum sediment grout additive mixture. Voids in certified low-level waste containers, which are to be disposed of in the RWMC, will be filled with the grout mixture containing the contaminated sediments. The

Table 3. Cost Estimation for Alternatives.

Alternative	Cost
Alternative 1 No Action	$ 0
Alternative 2 ***Option A***	
Contaminated Sediment Removal	$ 213,000
Emergency Discharge Tank	37,000
Sump Decontamination	22,000
Technical Support	95,000
Treatment and Disposal at the TRA Warm Waste Pond	190,000
Total Option A	$ 557,000
Option B	
Contaminated Sediment Removal	$ 213,000
Emergency Discharge Tank	37,000
Sump Decontamination	22,000
Technical Support	95,000
Treatment and Disposal at the RWMC	113,000
Total Option B	$ 480,000

estimated amount of contaminated sediments to be removed is approximately 100 cubic yards. The interim action of OU 5-13 will cost an estimated $480,000.

Removing the areas of high contaminant concentration will reduce the risk to human health by reducing the potential for exposure to chromium from inhalation and cesium-137 from direct ionizing radiation. The effectiveness of the interim action as a final action will be evaluated in the WAG 5 Comprehensive RI/FS, OU 5-12, scheduled to begin in 1996.

9.1 Sump Decontamination

Sludge and sediments will be removed from the sump to eliminate future contamination to the pond sediments during future discharge events. The sump will be pumped and the sludge and sediments will be collected and sampled. The interior of the sump will be decontaminated. The interior of the sump will be analyzed for radioactivity to ensure decontamination is complete. The discharge pipe will also be decontaminated and analyzed for residual radioactivity. Treatment of materials and sediments removed from the sump will be by grouting, if feasible based on treatability studies, and disposal at the RWMC.

9.2 Contaminated Sediment Removal

Approximately 100 cubic yards of the sediments in the PBF Evaporation Pond will be removed, incorporated into a grout mixture, and injected in void spaces of existing certified low-level waste containers for disposal at the RWMC. Field screening using portable radiation detectors will be used to identify sediments to be removed. The chromium and cesium-137 concentrations correlate well in the pond sediments as demonstrated by previous sampling efforts. By using field screening, elevated concentrations of cesium-137 and corresponding areas of elevated concentrations of chromium can be identified. Verification samples will be collected to ensure the concentration of remaining chromium does not pose an unacceptable risk. Sediment samples will be taken under the liner, and any sediments contaminated above cleanup levels will be removed and disposed of as part of this action. However, since no contamination has been identified beneath the liner, none of that material was included in the estimated volume of sediments to be removed. The cleanup levels for this interim action are 800 mg/kg for chromium and 30 pCi/g for cesium-137.

A doubled lined evaporation tank will be placed on the site to receive discharges that may occur during the interim action due to an emergency situation. This tank may be used for future discharges in lieu of relining the pond.

9.3 Estimated Waste Generation and Disposal Option

Any wastes generated by removing areas of high contaminant concentration will be disposed of in accordance with laws regulating their characteristics (hazardous, radioactive). Low-level radioactive wastes will be disposed of at the RWMC on the INEL. Minimal quantities of other hazardous wastes, such as laboratory wastes, may be disposed of offsite in accordance with EPA's *Revised Procedures for Planning and Implementing Off-Site Response Actions*. Solid waste will be disposed at offsite and onsite facilities, depending on availability.

If these existing treatment, storage, and disposal facilities are inadequate or unavailable, the following option will be implemented:

- The waste would be stored on the INEL until additional disposal facilities are available

If this conditions occurs, it would be resolved as soon as possible, but no later than the WAG 5 ROD (OU 5-12).

10. STATUTORY DETERMINATIONS

Under CERCLA, the DOE and EPA have primary responsibility to ensure interim actions taken at the site reduce the immediate, identified risks to human health and the environment. Additionally, CERCLA, section 121, as amended by SARA, establishes several other statutory requirements and preferences. These specify that, when complete, the final selected remedy at each OU must implement applicable or relevant and appropriate environmental standards established under federal and state environmental laws unless a statutory waiver is justified.

The selected remedy must also be cost-effective and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The remedy should represent the best balance of tradeoffs among alternatives with respect to pertinent criteria. Finally, the statute includes a preference for remedies employing treatments that permanently and significantly reduce the volume, toxicity, or mobility of hazardous wastes as their principal element. The selected remedy (removal of areas of high contaminant concentration and grouting of

the sediments for disposal at the RWMC) for the interim remedial action for OU 5-13 at the INEL meets these statutory requirements.

10.1 Protection of Human Health and the Environment

As described in Section 9, the selected remedy will alleviate the potential risk to human health by reducing the potential for exposure to chromium by inhalation and cesium-137 by direct ionizing radiation. This action may not constitute the final remedy for the PBF Evaporation Pond, Corrosive Waste Sump, and the discharge pipe. However, the statutory preference for remedies employing treatment that reduces toxicity, mobility, or volume as the principal element, although partially addressed in this remedy, will be fully addressed at the time of the final response action.

10.2 Compliance with ARARS

The selected remedy will comply with the substantive requirements of all ARARs. A summary of the ARARs for this interim action is given in the following sections.

10.2.1 Chemical-Specific ARARS

The Clean Air Act establishes national standards and goals for air pollution control. The chemical-specific ARAR applicable to this interim action is 40 CFR 61.92, "National Emission Standards for Hazardous Air Pollutants [NESHAP], National Emission Standards for Radionuclide Emission from DOE facilities." This applicable requirement specifies a limit of 10 mrem/yr for radiation exposures for the general public from ambient air concentrations of radionuclides.

Air emissions from the interim action facility will meet these standards. Based on current knowledge, there are no other chemical- or radionuclide-specific ARARs governing cleanup levels for the Evaporation Pond sediments, Corrosive Waste Sump, or discharge pipe.

10.2.2 Action Specific ARARs

- Applicable requirements of the rules for the "Control of Fugitive Dust," IDAPA 16.01.01251 and .01252 which specify that all reasonable precautions be taken to prevent the generation of fugitive dusts.

- Applicable requirements of 40 CFR 61.93, NESHAP, "Emission Monitoring and Testing Procedures," which contains monitoring requirements.

10.2.3 Location-Specific ARARs

There are no location-specific ARARs identified for this interim action.

10.2.4 Other Criteria, Advisories, or Guidance To-Be-Considered

Requirements under the Atomic Energy Act are applicable to the procurement, use, and disposal of all source, byproduct, and special nuclear material at the INEL. Although DOE Orders are not ARARs, since they are not promulgated requirements, all of the requirements of DOE Orders are to be considered. DOE Orders that may apply to this CERCLA activity include:

- DOE 5480.11, "Radiation Protection for Occupational Workers," establishes radionuclide-specific criteria to protect workers from hazard of exposure to ionizing radiation and radioactive materials.

- DOE 5820.2A, "Radioactive Waste Management," establishes standards for radiation exposure as follows:

  > . . . external exposure to the waste and concentration of radioactive material which may be released into surface water, groundwater, soil, plants, and animals which results in an effective dose equivalent that does not exceed 25 mrem/yr to any member of the public . . . and assures that the committed effective dose equivalents received by individuals who inadvertently may intrude into the facility after the loss of active institutional control (100 yrs) will not exceed 100 mrem/yr for a continuous exposure or 500 mrem/yr for a single acute exposure.

Removal of pond sediments and stabilization/solidification, as described, meets this standard for both the removed contaminants and the residual pond sediments.

11. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for OU 5-13, interim action of the PBF Evaporation Pond and Corrosive Waste Sump was released for public comment in March 1992. The PBF Proposed Plan identified Alternative 2, removal of areas of high contaminant concentration, as the preferred alternative. Upon review of the cost estimates presented for the two disposal options in the Proposed Plan, the cost estimates were found to be low. The revised total cost for this interim action, Alternative 2, Option B, is $480,000. This change reflects the addition of the costs for: technical support, decontamination of the sump and discharge pipe, and assembling a tank to receive any emergency discharge that may be necessary during the interim action. The increase in the cost estimates, which have changed from Table 2 of the Proposed Plan to the update in Table 3 of this ROD (Section 8.2.5), resulted from a review and revision of the assumptions used in developing the estimates. The adjustment is the same for both options presented for Alternative 2, and therefore, has no effect on the selected remedy.

The DOE, EPA, and IDHW have reviewed all written and verbal comments submitted during the public comment period. Upon review of these comments, it was determined no further significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.