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Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R10-91/029
September 1991

EPA

Superfund
Record of Decision:

Union Pacific Railroad Yard, ID

50272-101

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The Union Pacific Railroad Yard site is an active rail yard located in Pocatello, Bannock County, Idaho. Land use in the area is mixed commercial and light industrial, with some residential areas. Site features include sludge pits along the northwestern edge of the site, and Portneuf River, which is located 1,000 feet from the pit. Ground water in the vicinity of the sludge pit occurs in two distinct water-bearing deposits, the Upper and Lower Aquifers, which appear to be hydraulically connected. Union Pacific Railroad (UPRR) began operations around the turn of the 20th century. Site operations have included maintenance and repair work, train assembly, and refueling, which involved the use of various fuels, cleaning agents, detergents, and degreasers, including halogenated and non-halogenated hydrocarbon-based solvents. UPRR constructed a treatment plant in 1961 to receive industrial wastewater and surface stormwater runoff from the railyard. Until 1983, sludge from the treatment plant's oil/water separator and from a dissolved air flotation unit was disposed in the onsite sludge pit. Currently, the sludge pit contains approximately 2,500 cubic yards of sludge and 1,700 cubic yards of contaminated soil beneath the sludge. In 1983, EPA determined that seepage from

(See Attached Page)

17. Document Analysis a. Descriptors

Record of Decision - Union Pacific Railroad Yard, ID
First Remedial Action - Final
Contaminated Media: soil, sediment, sludge, gw
Key Contaminants: VOCs, other organics (PAHs), metals (arsenic, chromium, lead), oils

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 166
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(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

UPRR's sludge pit, and from a nearby area where an oil tie treating facility was located were contributing to Upper Aquifer ground water contamination. In 1985, UPRR, the only identified potentially responsible party, conducted an investigation of the railroad yard, and the sludge pit was determined to be the principal source of onsite contamination. This Record of Decision (ROD) addresses contamination of the Pocatello Sludge Pit located at the UPRR property. The primary contaminants of concern affecting the soil, sediment, sludge, and ground water are VOCs, other organics including PAHs and petroleum-based hydrocarbons (oils), and metals.

The selected remedial action for this site includes implementing a comprehensive soil, sediment, sludge, and ground water sampling effort prior to remedial activities to determine background levels and to set final remediation goals; excavating to the maximum extent practicable up to 4,200 cubic yards of visibly-contaminated soil, sediment, and sludge; testing these media for compliance with land disposal restriction treatment standards, followed by disposal at an approved offsite landfill; treating soil remaining beneath the excavated area using in-situ soil flushing as part of the Upper Aquifer ground water treatment system, backfilling, grading, and capping the entire pit boundary; extracting and treating nonaqueous phase liquid contaminants from the Upper Aquifer ground water using an onsite oil/water separator and a dissolved air flotation unit; discharging effluent offsite to a publicly owned treatment works (POTW); placing skimmed oil in an onsite holding tank for sale to a recycler; disposing of residual sludge from ground water treatment offsite; conducting quarterly sampling and analysis of ground water to ensure remediation goals are met; constructing a fence around the sludge pit; providing advanced funding for design and installation of an alternate water supply system to be implemented if monitoring indicates that ground water contamination has not been adequately remediated; monitoring ground water, surface water, and air; and implementing administrative and institutional controls including deed, land, and ground water use restrictions. The estimated present worth cost for this remedial action is $3,797,550, which includes a present worth O&M cost of $1,657,900 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific remediation goals have not been finalized, with the exception of lead 500 mg/kg for soil and 0.015 mg/l (MCL) for ground water, as a result of incomplete data regarding background concentrations of contaminants in soil, sediment, sludge, and ground water. Final clean-up goals will be based on background concentrations, lowest practical quantitation limits, ground water ARARs identified in the FS, or target concentration values, whichever is highest. Health-based cleanup goals include a 10^{-6} cancer risk for carcinogens and an HI<1 for non-carcinogens.

RECORD OF DECISION

for the

UNION PACIFIC RAILROAD SLUDGE PIT
POCATELLO, IDAHO

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DECLARATION OF THE
RECORD OF DECISION

SITE NAME AND LOCATION

Union Pacific Railroad Sludge Pit
Pocatello, Bannock County, Idaho

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Union Pacific Railroad Sludge Pit site in Pocatello, Idaho. This action was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP).

This decision is based on the Administrative Record for this site. The attached index identifies the items that comprise the Administrative Record upon which the selection of the remedial action is based.

The State of Idaho 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 the public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy for the Union Pacific Railroad Sludge Pit addresses contaminant threats at the site by excavating and disposing of contaminated sludge, silt and soil; by removing nonaqueous phase liquid (NAPL) contaminants from the Upper Aquifer groundwater surface, and by flushing residual contamination from the soil. The remedy is designed to significantly reduce exposure to the contaminated sludge, silt and soil, and contaminated groundwater. The goal of the selected remedy is to remediate the sludge, silt and soil, and the contaminated groundwater to levels that are protective of human health and the environment.

The major components of the selected remedy include:

- Excavating contaminated sludge, silt and soil to the maximum extent practicable, followed by disposal at an approved offsite

Resource Conservation and Recovery Act (RCRA) landfill; excavated areas will be backfilled with clean fill and graded.

• Testing of contaminated sludge and soil prior to disposal to demonstrate compliance with land disposal restriction (LDR) treatment standards at a frequency specified in the receiving facility's waste analysis plan, including Toxicity Characteristic Leaching Procedure Extraction (TCLP); treatment, if necessary, prior to disposal. Test results indicate that the sludge and soil are not RCRA characteristic waste, and therefore, no problems are anticipated with disposal at the facility. However, if unforseen circumstances arise, a treatability variance for the wastes is requested should the wastes fail TCLP and the Paint Filter Test at the disposal facility.

• Placing and maintaining a low permeability cap over the entire pit boundary following excavation, backfilling and grading. Areas outside the pit that are excavated will be backfilled with clean fill and graded.

• Treating soils and nonaqueous phase liquid (NAPL) contaminated Upper Aquifer groundwater via soil flushing, an onsite oil/water separator, and a dissolved air flotation unit in order to prevent migration of NAPL to the Lower Aquifer and to reduce NAPL and other contaminant concentrations which exceed proposed maximum contaminant levels and maximum contaminant level goals; effluent discharge to the Pocatello publicly owned treatment works; residual sludge resulting from groundwater treatment tested and disposed in an approved, offsite landfill; potable water obtained from Batiste Springs for use in the infiltration galleries for washing contaminated soils.

• Providing advance funding for design and installation of an alternate water supply system to serve potential future onsite businesses and/or residences, in the event that the system is determined to be needed. Since businesses and residences do not exist onsite, installation of a new water supply is not immediately required.

• Constructing a six-foot-high chain link fence around the entire sludge pit to ensure site security and to restrict public access to the site.

• Implementing administrative and institutional controls in the property deed such as air monitoring, groundwater monitoring, and land and water use restrictions, that supplement engineering controls and minimize exposure to releases of hazardous substances during and following remedial activities.

• Conducting quarterly sampling and analysis of groundwater from all onsite wells, at a minimum, for the first three years following completion of remedial activities. If deemed appropriate, the sampling rate will be reduced to a lesser frequency for the remaining 27 years. Monitoring of the groundwater and the pump/treat system during groundwater remediation activities will be conducted to ensure that groundwater remediation goals are achieved. If cleanup goals are not met, modifications to the groundwater treatment system will be necessary.

• Implementing a comprehensive, onsite and offsite, soil and groundwater sampling effort, prior to initiation of remedial activities, to determine background levels in these media and the extent to which onsite concentrations exceed background levels. Preliminary target concentrations/remediation goals for contaminants of concern have been established for the site and are provided in the Record of Decision. Final remediation goals, target concentrations and performance standards will be identified following the determination of soil and groundwater background concentrations.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment; complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action; and is cost effective. This remedy uses permanent solutions and alternative treatment technologies or resource recovery technologies, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

While the risk assessment appears to indicate that the contaminated sludge and soil in the sludge pit may present an imminent and substantial endangerment to public health, welfare and the environment, EPA has determined that it does not pose a principle threat at this site.

Existing analysis of railyard and wastewater treatment plant operations, applicable governmental regulations, and the results of sludge chemical analyses indicate the sludge is not a hazardous waste as defined by RCRA, pursuant to 40 CFR 261.4(b)(7); therefore, the RCRA Land Disposal Restrictions do not apply.

The selected remedy for addressing contaminated sludge and soil within the sludge pit is excavation, to the maximum extent practicable, and offsite disposal. This portion of the selected remedy is not considered to be treatment. However, physical extraction of contaminants from soils (underlying the sludge and soil removed by excavation) using in-situ soil flushing is considered an innovative treatment technology. Treatment technologies including solidification and incineration were considered but were determined to be technically infeasible for the following reasons:

Solidification: Because of the oily consistency of the sludge, the ability to ensure successful implementation and maintenance of this remedy is highly uncertain.

Incineration: Elevated contaminant levels of metals found in the sludge present significant uncertainty in the technology's ability to achieve target cleanup concentrations.

Because this remedy will result in hazardous substances remaining onsite within the groundwater, above health-based levels, a review will be conducted within five years after commencement of remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

Dana A Rasmussen

DANA A. RASMUSSEN
Regional Administrator, Region 10
U.S. Environmental Protection Agency

Date

DECISION SUMMARY

INTRODUCTION

The Union Pacific Railroad Sludge Pit was nominated to the National Priorities List (NPL) in September 1983. The nomination was based on a Hazard Ranking System (HRS) score the pit received from a site assessment performed by EPA in June 1983. The site was placed on the NPL in September 1984 (49 Federal Register 37083, September 21, 1984) under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA).

Pursuant to Executive Order 12580 (Superfund Implementation) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the Union Pacific Railroad performed a Remedial Investigation/Feasibility Study (RI/FS) for the Union Pacific Railroad Sludge Pit. The Remedial Investigation (RI)(1990) characterized contamination in the sludge, silt, soil, surface water and groundwater. The Baseline Risk Assessment (1990) evaluated potential effects of the contamination on human health and the environment. The Feasibility Study (FS)(1991) evaluated alternatives for remediating contamination.

I. SITE NAME, LOCATION, AND DESCRIPTION (Maps 1 and 2)

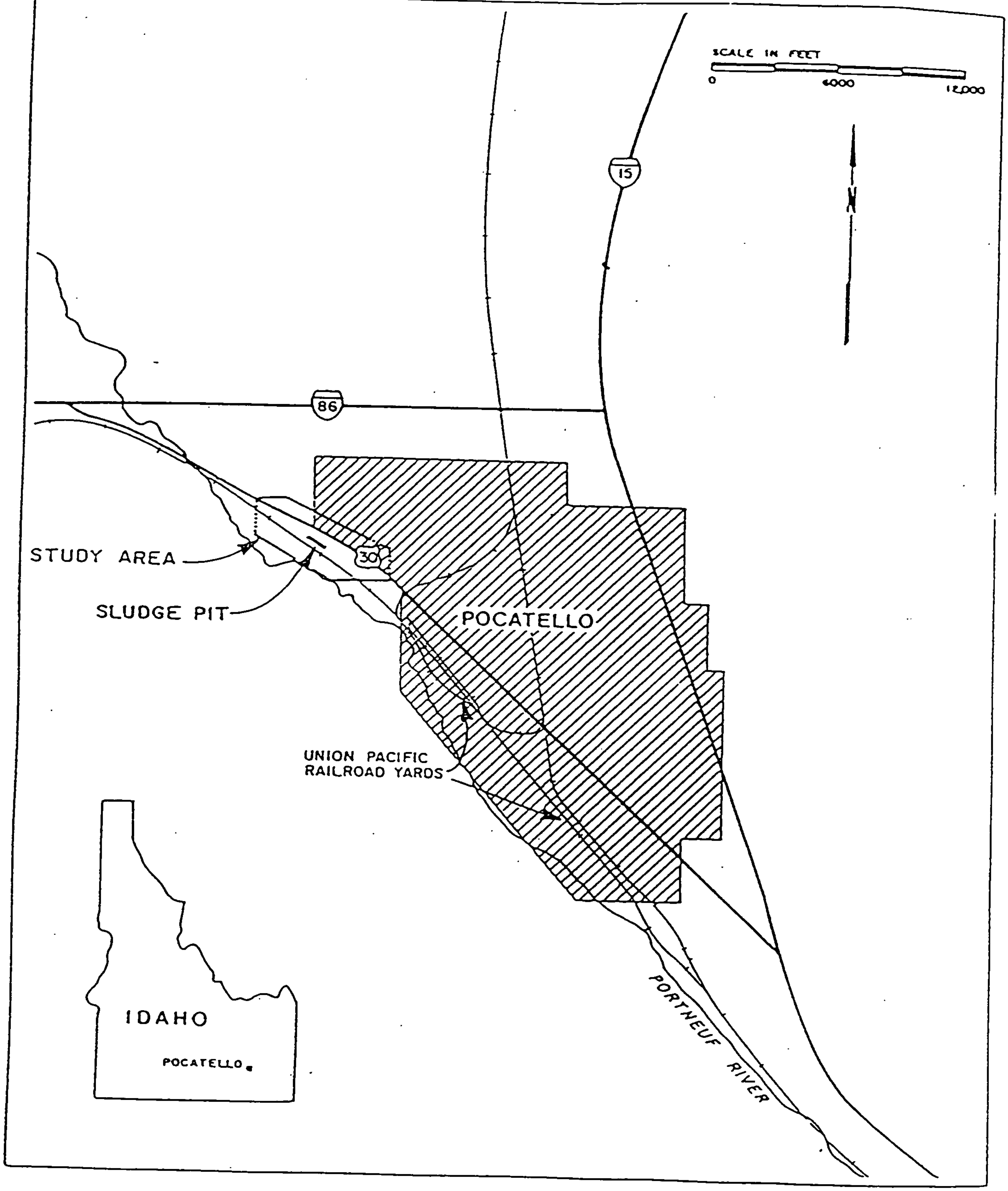
The Pocatello Sludge Pit is located on Union Pacific Railroad (UPRR) property in the southern half of Section 16, Township 6 South, Range 34 East of the Boise Meridian, Bannock County, Idaho. The property is on the northwest edge of the city of Pocatello, Idaho, a few hundred feet south of U.S. Highway 30. The Pocatello Sludge Pit is in a mixed commercial and light industrial setting, with residential areas approximately 0.3 mile to the north and east of the site. The McCarty's/Pacific Hide and Fur Superfund site abuts Union Pacific Railroad property to the northeast and is upgradient of the UPRR site.

There are no major structures or yard facilities located on UPRR property near the sludge pit. The land surface surrounding the pit slopes gently to the southwest towards the river. The area is sparsely vegetated with wild grass and sagebrush.

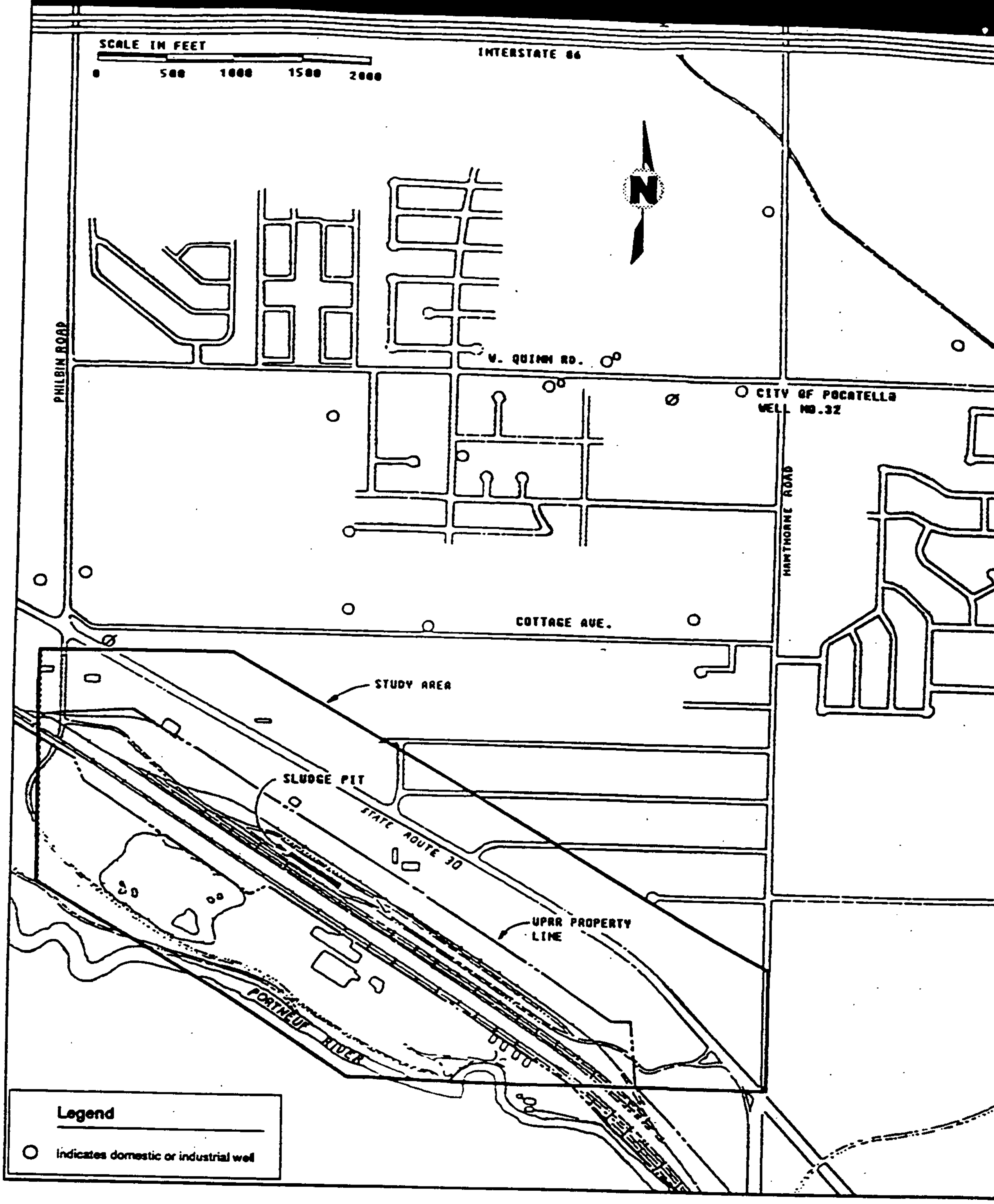
The sludge pit is 620 feet long (along the northwestern edge) by 58 feet wide, covering approximately one acre. Sludge thickness ranges from 1.5 to 4.4 feet. The pit contains approximately 2,500 cubic yards of sludge. The sludge consistency ranges from desiccated to oily. Approximately another 1,700 cubic yards of contaminated soil underlies the pit.

Two concrete retaining walls, each approximately 450 feet long, run longitudinally through the pit and rise about two feet above

MAP 1


SCALE IN FEET
0
6000
12,000
N
15
86
30
STUDY AREA
SLUDGE PIT
POCATELLO
UNION PACIFIC
RAILROAD YARDS
PORTNEUF RIVER
IDAHO
POCATELLO

Map 2:
Sludge Pit and Study Area



the sludge bed. The pit is bermed along the north and east sides with soil varying in height from one to two feet. The pit is surrounded by a barbed wire fence.

Groundwater in the sludge pit vicinity occurs in two distinct water bearing deposits (Upper Aquifer and Lower Aquifer) separated by a less permeable clay layer. The Lower Aquifer is very productive and is used as a water source by local, private residents, businesses, and the City of Pocatello (Supply Well No. 32). No water supply wells in the area have been found to utilize the Upper Aquifer, which is contaminated with chemicals that have migrated downward from the sludge, through the silt and soil, to the groundwater surface. Contaminants have also been identified in the Lower Aquifer but are below Safe Drinking Water Act standards.

The Portneuf River is 1,000 feet from the pit and is frequented by a variety of fish and wildlife species. Land surface at the sludge pit is approximately 35 feet above the average river level. To date, no adverse affects to environmental resources from the site have been reported.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

Union Pacific Railroad (UPRR) has operated a railroad yard in Pocatello, Idaho since approximately the turn of the century. Operations have included maintenance and repair work, train assembly, and refueling. Railroad operations have involved the use of various fuels, cleaning agents, detergents, and degreasers, including halogenated and non-halogenated hydrocarbon based solvents.

UPRR constructed a treatment plant in 1961 that receives industrial wastewater from the railyard as well as the yard's surface stormwater. The wastewater is treated in a process that recovers free oil and yields treated effluent and residue sludge. The effluent, discharged to the Portneuf River between 1961 and 1978, has been discharged to the City of Pocatello's sewer system since 1978. Sludge from the wastewater treatment plant's oil/water separator and from a dissolved air flotation unit was placed in the sludge pit until 1983.

Historical and current industrial operations in the surrounding vicinity that provide potential additional sources of environmental contamination are discussed below.

The Pocatello Timber Treating Plant, owned by the Oregon Short Line Railroad, occupied approximately 15 acres immediately northwest of the sludge pit. UPRR records indicate the plant began operation in 1917, primarily treating railroad ties. A zinc chloride based solution was the original treating medium;

creosote was used after 1927. The plant closed in 1942 and was demolished in 1948.

Neighborhood industrial sites that historically performed a variety of manufacturing and process activities included the nearby H. O. Miller Distributor Company, which stored bulk petroleum products in the 1950s; the Phillips Petroleum Refinery which is suspected of operating sludge ponds from 1941 to 1956; the Patton Gravel Pit processed batteries from the late 1960s to early 1970s and backfilled the pit with demolition debris from 1968 to 1980; and, the Pacific Hide and Fur Company, which operates a metals recycling business and historically, in conjunction with McCarty's Inc., salvaged transformers and capacitors, discharging coolant oils to the ground surface.

In 1983, an EPA site investigation found that seepage from UPRR's sludge pit, and from an area in the vicinity of the sludge pit where an oil tie treating facility was located, were contributing to Upper Aquifer (and to some extent, Lower Aquifer) groundwater contamination. Samples from private wells, completed in the Lower Aquifer in the vicinity of UPRR's property, contained low levels of organic compounds consistent with the wastes discharged to the pit.

Following the site's placement on the NPL on September 21, 1984, UPRR retained Applied Geotechnology, Inc. (AGI) in 1985, an independent contractor, to conduct a limited investigation of the UPRR site and to evaluate the nature and extent of the suspected contamination. UPRR and AGI presented the results of that investigation to EPA in November, 1986.

On January 8, 1988, a General Notice Letter/Request For Information was sent by EPA to UPRR, the only identified potentially responsible party (PRP) for the sludge pit. A Consent Order (No. 1088-01-03-106) was signed by EPA and UPRR on June 21, 1988. In compliance with that order, UPRR was directed to supplement the data in the preliminary report and to prepare an RI/FS as outlined in CERCLA. AGI began the RI in July, 1988, and completed activities in April, 1989.

A Risk Assessment and FS for the site were also prepared by UPRR contractors and were completed in November, 1990 and April, 1991, respectively.

III. COMMUNITY RELATIONS

Throughout the UPRR Sludge Pit site's history, community concern and involvement has been low. EPA has kept the community and other interested parties apprised of site activities through fact sheets and published notices.

In June, 1988, EPA released a community relations plan which outlined a program to address community concerns and provide opportunities for community involvement during remedial activities.

The specific statutory requirements for public participation at the Union Pacific Railroad Sludge Pit under CERCLA include the release of the RI/FS results and the Proposed Plan to the public. In accordance with Sections 117 and 113(k)(2)(B) of CERCLA, the public was given the opportunity to participate in the remedy selection process. The Proposed Plan, which summarized the alternatives evaluated and presented the preferred alternative, was mailed to approximately 130 interested parties in June 1991.

Concurrent with distribution of the Proposed Plan, EPA made the Administrative Record available for public review at EPA's offices in Seattle, Washington, and at the Pocatello Public Library. Notice of the Proposed Plan availability and public comment period was placed in the June 6, 1991, Idaho State Journal. The public comment period was held June 7, 1991, to July 8, 1991.

On June 18, 1991, EPA held a public meeting to accept oral comments on the Agency's Proposed Plan. During this meeting, the Agency gave a presentation on the cleanup alternatives and answered questions from the public. The public was encouraged to submit any written comments on the alternatives presented in the Feasibility Study and the Proposed Plan and on the other documents which were a part of the Administrative Record for the site. A transcript of the public meeting and comments and the Agency's response to comments are included in the attached responsiveness summary.

The following is a summary of EPA community relations activities to date at the site:

- September 1983 - Site proposed for NPL.
- September 1984 - Site listed on NPL.
- June 1988 - Interview conducted with local officials and citizens to develop Community Relations Plan.
- June 1988 - Community Relations Plan was published.
- June 1988 - Information repositories established at the Southeastern Idaho Health District office, and the Pocatello Public Library.
- August 1988 - EPA distributed a fact sheet providing information on the start of the field work for the Remedial Investigation.

- July 1989 - EPA distributed a fact sheet on findings of the RI and announced upcoming activities related to the cleanup of the site.

- January 1990 - EPA distributed a fact sheet to update the public on site work.

- June 1991- Proposed Plan was published.

- June 7, 1991 to July 8, 1991 - Public comment period for Proposed Plan.

- June 18, 1991 - Public meeting on Proposed Plan. Approximately 20 people attended this meeting. Meeting was announced in Proposed Plan and local newspaper.

IV. SCOPE AND ROLE OF RESPONSE ACTION WITHIN SITE STRATEGY

The selected remedy for final action is intended to address all of the concerns originating from the contamination at the Union Pacific Railroad Sludge Pit. The principal source of contamination, based on the RI sample results, is the sludge. Contaminants have migrated from this media to the surrounding soils and leached into the Upper Aquifer resulting in concentrations above applicable or relevant and appropriate requirements (ARARs) and health-based risk values.

The primary purpose of the selected remedy is to remove the source of contamination by excavating and disposing of sludge, silt and soil in and around the pit, followed by backfilling, grading and capping of the excavated area to meet cleanup goals. During the RI, the groundwater in the Upper Aquifer was found to be contaminated with nonaqueous phase liquids, polycyclic aromatic hydrocarbons, metals and other chemicals such as chlorinated solvents. Under the selected remedy, pump and treatment of the Upper Aquifer and cleansing of soils beneath the excavated material, using soil flushing, will be employed to meet groundwater cleanup goals. This treatment will be employed to prevent migration of nonaqueous phase liquids (NAPL) and other contaminants to the Lower Aquifer and to reduce contaminant levels which exceed proposed maximum contaminant levels (PMCLs) and goals (PMCLGs).

Union Pacific Railroad will perform additional field work prior to implementation of the remedy to determine whether contaminants found in the soil and groundwater occur at "background" levels. Cleanup goals will be established for those contaminants where none had previously been set; preliminary target concentrations identified in the ROD will be refined and finalized along with performance standards. Once treatment begins, a long-term monitoring program will be implemented to evaluate performance of the selected remedy.

V. SUMMARY OF SITE CHARACTERISTICS

The following discussion summarizes data from the sampling and analyses performed as part of the RI.

A. Sludge Contamination

The pit contains approximately 2,500 cubic yards of sludge. Another 1,700 cubic yards of contaminated soil underlies the pit.

The sludge pit was investigated and sampled from 1985 to 1988. The initial sampling data provided a basic understanding of the sludge pit's geometry and contents. Further analyses provided data to evaluate physical and chemical characteristics of the sludge.

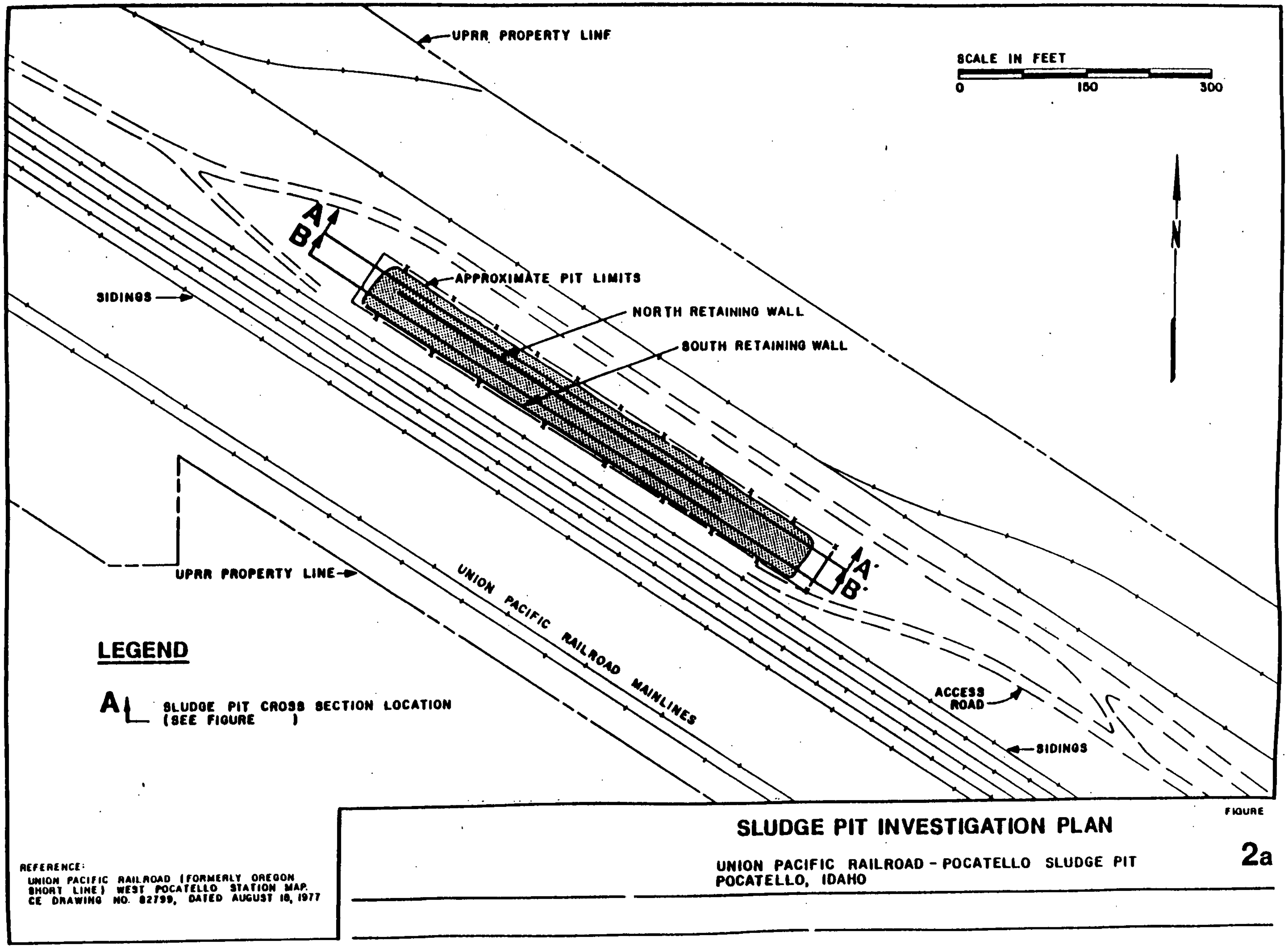
The sludge within the pit has been characterized as generally brown to black, oily, and of varied consistency. Much of the sludge's initial fluid content has evaporated, leaving a dry, relatively firm crust. Hydrocarbons, including chlorinated volatile organic compounds, polycyclic aromatic hydrocarbons, and metals (arsenic, cadmium, chromium, lead, nickel, and zinc) are the compounds of most concern associated with the sludge pit. Figure 1 indicates the estimated extent of soil contamination based on a summary of all data from 1985-1989.

The silt underlying the sludge has a grayish appearance. It is rather hard and resilient and ranges from dry to moist. In most subsurface borings, the silt was extremely difficult to penetrate and appeared to be cemented by chemical compounds leached from the sludge. The gravel underlying the remainder of the sludge pit could not be penetrated. Consequently, the degree to which the gravel received contaminants from the sludge could not be evaluated. Figures 2A and 2B depict the plan view of the sludge pit investigation and the cross sections of the north and south sides of the sludge pit, respectively.

The bulk physical composition of the sludge is approximately 65 percent solids and 35 percent water; this ratio changes seasonally. The solid fraction yields approximately 70 percent ash and 30 percent volatile solids. The bulk sludge (solids and liquid phases) is composed of approximately 26 percent oil and grease and 0.5 percent total sulfate.

Chemical analyses performed on sludge samples resulted in the identification of the following contaminants:

1. Metals- The primary inorganic constituents in the sludge are common soil metals, including calcium, aluminum,

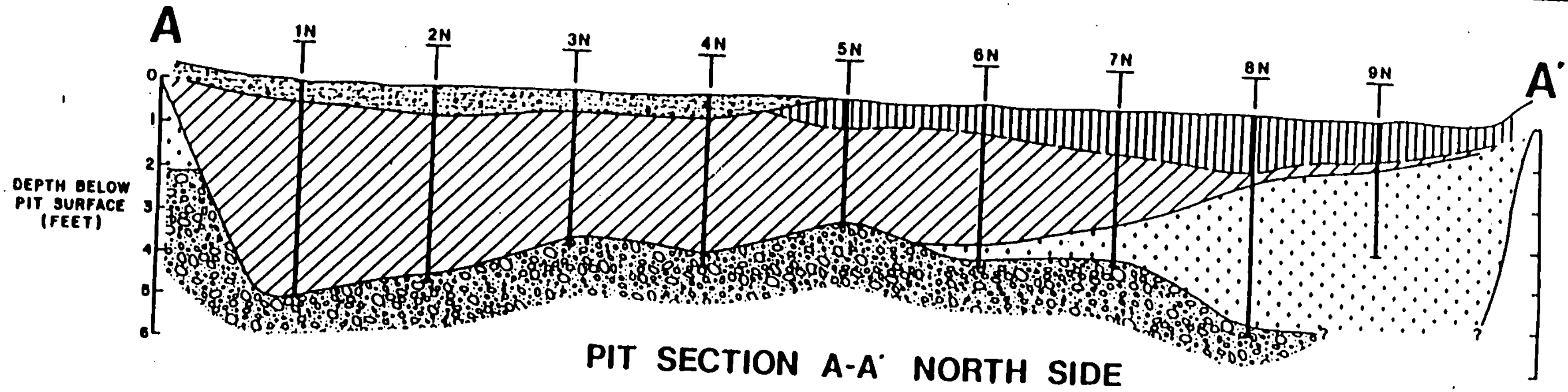


REFERENCE:
UNION PACIFIC RAILROAD (FORMERLY OREGON SHORT LINE) WEST POCATELLO STATION MAP. CE DRAWING NO. 82799, DATED AUGUST 18, 1977

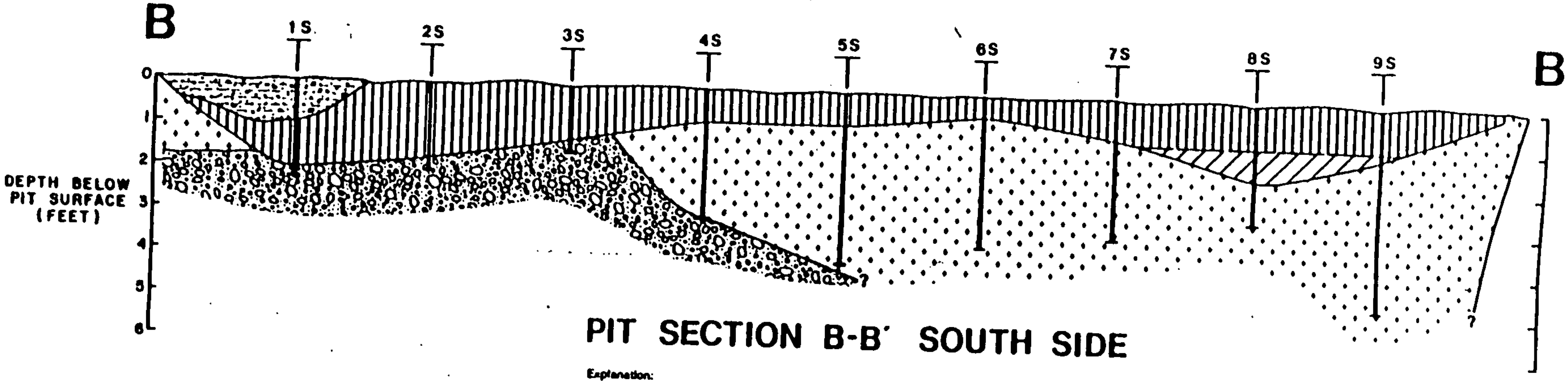
SLUDGE PIT INVESTIGATION PLAN

UNION PACIFIC RAILROAD - POCATELLO SLUDGE PIT
POCATELLO, IDAHO

FIGURE 2a



PIT SECTION A-A' NORTH SIDE



PIT SECTION B-B' SOUTH SIDE

Explanation:

These cross sections are diagrammatic interpretations of subsurface conditions based on interpolation and extrapolation of data from borings.

Actual conditions are substantially more complex than depicted and will vary between borings.

AGI does not represent the conditions illustrated as exact, but recognizes that variations exist.

LEGEND

- BROWN SILTY SAND (FILL)
- DESICCATED SLUDGE
- OILY SLUDGE
- SILT (RECENT ALLUVIUM)
- BROWN SANDY GRAVEL (OLDER ALLUVIUM)

SEE FIGURE FOR CROSS-SECTION LOCATIONS

SCALE IN FEET

0 75 150

VERTICAL EXAGGERATION = 20X

SLUDGE PIT CROSS SECTIONS

UNION PACIFIC RAILROAD - POCATELLO SLUDGE PIT
POCATELLO, IDAHO

FIGURE 2b

iron, magnesium, and potassium. The sludge also contains cadmium, chromium, copper, lead, mercury, and zinc at higher concentrations than adjacent soils. A third group of metals which includes antimony, arsenic, cobalt, manganese, nickel, and vanadium, are present at low but detectable concentrations. Metals sampling results are presented in Table 1.

Soil leaching studies [EP-Toxicity, EPA-Toxicity Characteristic Leaching Procedure Extraction (TCLP), and a deionized water leach test] were performed on sludge samples. These studies indicate metals in the sludge are generally not available for leaching and are not mobile unless an acidic leaching solution is used. Table 2 presents the sludge TCLP data and TCLP standards.

2. Volatile and Semivolatile Organic Compounds- Eight target compound list (TCL) volatile organic compounds were detected in the 1985 sludge samples: ethylbenzene, toluene, xylenes, trans-1,2-dichloroethene, trichloroethene, tetrachloroethene, acetone, and methyl ethyl ketone. Only four of these compounds were detected in the 1988 sludge samples: ethylbenzene, xylenes, trans-1,2-dichloroethene and tetrachloroethene. The 1988 samples contained lower concentrations of these compounds. This may be due to differences in sampling procedures or to actual changes in the sludge during the intervening years. Oily sludge which is expected to be the most contaminated is the most difficult to retain in the sampling tubes, and complete recovery was not possible. The differences may also reflect an actual decrease in the concentration of volatile organic components. Possible causes of the decrease include migration and volatilization of compounds from the sludge pit.

Semivolatile TCL organic compounds detected in 1985 sludge samples include polycyclic aromatic hydrocarbons (PAHs), nitrosamines, a phthalate, and dichlorobenzene. The sludge samples also contained a substantial number of non-TCL hydrocarbons. The 1988 sludge samples contained PAHs and dichlorobenzene. Tables 1 and 3 list the semivolatile and volatile compounds found in the sludge.

TCLP extractions for volatile and semivolatile compounds indicate several chlorinated volatile and semivolatile organic compounds leach from the sludge under moderately acidic conditions.

The existing analysis of railyard and wastewater treatment plant operations, applicable governmental regulations, and the results of chemical analyses indicate the sludge is not a characteristic waste as defined by the Resource Conservation and Recovery Act,

TABLE 1

SUMMARY OF METAL AND SEMIVOLATILE ORGANIC COMPOUNDS IN SLUDGE (mg/kg) (a)

	Concentration Mean	Maximum	Detection Limits	No. of Detects/ No. of Samples
Metals - Total				
Antimony	1.9	3.3	1.0	4 / 6
Arsenic	21.5	27.4	--(b)	6 / 6
Beryllium	Not Detected		0.5,1	0 / 6
Cadmium	24.9	40.2	--	6 / 6
Cobalt	10.8	12.1	--	3 / 3
Chromium	92	136	--	6 / 6
Copper	184	242	--	6 / 6
Lead	1036	1460	--	6 / 6
Manganese	226	261	--	4 / 4
Mercury	0.68	0.96	--	6 / 6
Nickel	26	35.8	--	6 / 6
Selenium	Not Detected		1.0	0 / 6
Silver	1.5	2.7	2.5	1 / 6
Thallium	Not Detected		1.0	0 / 6
Vanadium	36.1	45.8	--	3 / 3
Zinc	1129	1530	--	6 / 6
Semivolatile Organic Compounds				
Anthracene	11	26	2.5,16,20	2 / 6
Benzyl Alcohol	46	67	20	3 / 3
1,2-Dichlorobenzene	16	38	2.5,16,20	4 / 6
1,4-Dichlorobenzene	5.6	10(c)	2.5,16,20	1 / 6
2,6-Dinitrotoluene	40	51	20	3 / 3
Fluorene	6	14	20,2.5,1.7	1 / 6
2-Methylnaphthalene	1051	2600	2.5,16,20	4 / 6
Naphthalene	8	14	20,2.5	4 / 6
N-Nitrosodiphenylamine	43	54	10	3 / 3
Phenanthrene	22	64	20,2.5	4 / 6
Pyrene	6.9	10(c)	2.5,16,20	2 / 6

(a) From surface sludge samples and sludge composite samples in Tables 4.5, 4.9 and 4.10 in Remedial Investigation report (RI) (AGI, 1990a).
(b) "--" indicates that detection limit was not provided with data.
(c) Indicates value is one-half the highest detection limit.

TABLE 2

SLUDGE TCLP DATA AND TCLP STANDARDS[1]

	TCLP Data for Sludge[2] (mg/l)	TCLP Standard[3] (mg/l)
Arsenic	<0.3	5.0
Cadmium	<0.1	1.0
Chromium	<0.1	5.0
Lead	<0.3	5.0
Mercury	<0.0005	0.2
Selenium	<0.3	1.0
Silver	<0.5	5.0
Benzene	<0.002	0.5
Carbon Tetrachloride	<0.002	0.5
Chlorobenzene	<0.002	100.0
Chloroform	0.005 B	6.0
1,2-Dichloroethane	<0.002 B	0.5
1,1-Dichloroethene	<0.002	0.7
2-Butanone (MEK)	<0.020	200.0
Tetrachloroethene	<0.02	0.7
Trichloroethene	0.002	0.5
Vinyl Chloride	<0.002	0.2

Notes:

(1) This table lists only those parameters which have TCLP standards.
(2) Data is from AGI, 1990a.
(3) FR March 29, 1990.
B - Analyte present in Method Blank.

TABLE 3

SUMMARY OF VOLATILE ORGANIC COMPOUNDS
IN SLUDGE (mg/kg) (a)

	Concentration		Detection	No. of Detects/
	Mean	Maximum	Limits	No. of Samples
Volatile Organic Compounds				
Acetone	1.43	2.5(b)	5,2,0.5,1.0	1 / 5
2-Butanone	1.86	3.7	5,2,0.5,1.0	2 / 5
Chlorobenzene	0.248	0.66	0.5,0.25,0.2	1 / 6
Chloroform	0.201	0.38	0.5,0.25,0.2	1 / 6
Chloromethane	0.605	2.5(b)	5,2,1,0.5	1 / 6
1,1-Dichloroethane	1.52	8.30	0.5,0.25,0.2	1 / 6
t-1,2-Dichloroethene	34.1	107.0	0.5,0.25,0.2	4 / 6
Ethylbenzene	35.2	100.0	0.5,0.25,0.2	4 / 6
Methylene Chloride	24.2	86.0	3,1.2,0.5	3 / 6
Toluene	1.61	7.4	0.5,0.25,0.2	3 / 6
1,1,2,2-Tetrachloroethane	0.378	0.99	0.5,0.25,0.2	4 / 6
Tetrachloroethene	15.4	56.0	0.5,0.25,0.2	4 / 6
Trichloroethene	19.9	51.0	0.5,0.25,0.2	3 / 6
Total Xylenes	99.0	370.0	0.5,0.25,0.2	4 / 6

(a) From sludge samples S1, S2, S3, SP-1, SP-2, and sludge composite in Tables 4.7 and 4.8 in Remedial Investigation report (RI) (AGI, 1990a).
(b) Indicates value is one-half the highest detection limit.

pursuant to 40 CFR 261.4(b)(7). However, incorporated in the selected remedy is the requirement for testing, and treatment if necessary, of contaminated sludge and soil prior to disposal in the landfill to demonstrate compliance with land disposal requirement (LDR) treatment standards.

B. Soil Contamination

During the RI, soil samples were collected from around and below the sludge pit. Soil directly adjacent to and beneath the sludge pit is contaminated with petroleum hydrocarbons, TCL volatile and semivolatile organic compounds, and heavy metals. Tables 4 through 7 provide summaries of the contaminants found in subsurface soils and silt underlying the sludge pit.

Mean and maximum metal concentrations detected in soil samples were typically less than those in sludge samples except for beryllium and manganese.

Concentrations of volatile organic compounds detected in soil were generally less than those detected in sludge, with the exception of carbon tetrachloride and 4-methyl-2-pentanone (MIBK). Semivolatile organic compound concentrations were generally less in soil than sludge. However, the following polycyclic aromatic hydrocarbons were detected in subsurface soil samples but not in the sludge: benzo[a]anthracene, benzo[k]fluoranthene, benzo[g,h,i]perylene, benzo[a]pyrene, chrysene, fluoranthene, and indeno[1,2,3-cd]pyrene. It is hypothesized that these either originated in the sludge or were in the sludge but not detected due to higher laboratory detection limits or matrix interferences.

C. Groundwater Contamination

Petroleum hydrocarbons (as nonaqueous phase liquids- NAPL) have migrated from the sludge through the surrounding soils and are floating on the surface of the water table (Upper Aquifer) below the pit. This NAPL layer is similar in composition to a medium weight fuel or lubricating oil and is approximately 2 inches thick. Borehole information suggests that some of the contaminants have adhered to soil particles and other material as they migrated through the surrounding soil layers. Hydrocarbon-contaminated soil appears to lie primarily beneath the sludge pit, based on soil sampling, visual observations and a strong hydrocarbon odor observed during the RI. Tests indicate that the NAPL does not contain high concentrations of metals. No polychlorinated biphenyls (PCBs) were detected.

The NAPL is estimated to cover approximately two-thirds to three-quarters of an acre, and underlies and extends past the northwestern half of the sludge pit. Figure 3 indicates the

TABLE 4

SUMMARY OF METAL AND SEMIVOLATILE ORGANIC COMPOUNDS IN SUBSURFACE SOIL (mg/kg) (a)

	Concentration		Detection	No. of Detects/
	Mean	Maximum	Limits	No. of Samples
Metals - Total				
Antimony	Not Detected		1.5	0 / 18
Arsenic	7.9	21.9	1.0	18 / 18
Beryllium	0.6	1.2	0.5	9 / 18
Cadmium	0.9	5.3	0.5	8 / 18
Cobalt	4.5	7.3	1.0	17 / 18
Chromium	10.1	19.1	0.5	17 / 18
Copper	14.9	42.1	1.0	17 / 18
Lead	10.0	74.8	1.5	17 / 18
Manganese	215	717	0.5	17 / 18
Mercury	Not Detected		0.25,0.40	0 / 18
Nickel	11	21	1.0	17 / 18
Selenium	Not Detected		1.0	0 / 18
Silver	Not Detected		2.5	0 / 18
Thallium	Not Detected		1.0	0 / 18
Vanadium	10.5	19.5	0.5	17 / 18
Zinc	86	1110	0.5	17 / 18
Semivolatile Organic Compounds				
Anthracene	0.6	10.0	0.17	1 / 18
Benzyl Alcohol	Not Analyzed			
Benzo(a)Anthracene	1.36	23.0	0.17	1 / 18
Benzo(k)Fluoranthene	2.15	33.0	8.5, 0.17	1 / 18
Benzo(g,h,i)Perylene	0.75	12.0	0.17	1 / 18
Benzo(a)Pyrene	1.02	17.0	0.17	1 / 18
Chrysene	1.36	23.0	0.17	1 / 18
1,2-Dichlorobenzene	Not Analyzed			
1,4-Dichlorobenzene	Not Analyzed			
2,6-Dinitrotoluene	Not Analyzed			
Fluorene	0.35	4.25(b)	8.5, 0.17	2 / 18
Fluoranthene	2.48	43.0	0.17	2 / 18
Indeno(1,2,3-cd)Pyrene	0.75	12.0	0.17	1 / 18
2-Methylnaphthalene	Not Detected		8.5, 0.17	0 / 18
Naphthalene	Not Detected		8.5, 0.17	0 / 18
N-Nitrosodiphenylamine	0.62	4.25(b)	8.5, 0.17	3 / 18
Phenanthrene	1.09	18.0	0.17	2 / 18
Pyrene	3.09	54.0	0.17	2 / 18

(a) From Tables 8.2 and 8.6 in Remedial Investigation report (RI) (AGI, 1990a).
(b) Indicates value is one-half the highest detection limit.

TABLE 5

SUMMARY OF VOLATILE ORGANIC COMPOUNDS
IN SUBSURFACE SOIL (mg/kg) (a)

	Concentration Mean	Maximum	Detection Limit	No. of Detects/ No. of Samples
Volatile Organic Compounds				
Acetone	Not Detected		12,0.1	0 / 36
2-Butanone	Not Detected		0.25,0.1	0 / 36
Carbon Tetrachloride	0.003	0.006	0.005	1 / 18
	0.013 (b)	ND	0.025	0 / 18
(weighted average)	0.008	0.013(b)	NA	1 / 36
Chlorobenzene	Not Detected		0.005,0.025	0 / 36
Chloroform	Not Detected		0.005,0.025	0 / 36
Chloromethane	Not Detected		0.25,0.1	0 / 36
1,1-Dichloroethane	Not Detected		0.025,0.005	0 / 36
t-1,2-Dichloroethene	Not Detected		0.025,0.005	0 / 36
Ethylbenzene	Not Detected		0.025,0.005	0 / 36
Methylene Chloride	Not Detected		0.3,0.005	0 / 34
4-Methyl-2-Pentanone	0.025 (b)	ND	0.050	0 / 18
	0.156	0.69	0.25	1 / 18
(weighted average)	0.091	0.69	NA	1 / 36
Toluene	0.003	0.003	0.005	2 / 18
	0.021	0.13	0.025	2 / 18
(weighted average)	0.012	0.13	NA	4 / 36
1,1,2,2-Tetrachloroethane	Not Detected		0.005,0.025	0 / 36
Tetrachloroethene	0.0025 (b)	ND	0.005	0 / 18
	0.015	0.05	0.05	1 / 18
(weighted average)	0.009	0.05	NA	1 / 36
Trichloroethene	Not Detected		0.005,0.025	0 / 36
Total Xylenes	Not Detected		0.005,0.025	0 / 36

(a) From samples in Tables 8.3 and 8.4 in Remedial Investigation report (RI) (AGI, 1990a).
(b) Indicates value is one-half the highest detection limit.
ND Not detected.
NA Not applicable.

TABLE 6

SUMMARY OF METAL AND SEMIVOLATILE CHEMICALS IN SILT UNDERLYING THE SLUDGE PIT (mg/kg) (a)

	Concentration Mean	Concentration Maximum	Detection Limits	No. of Detects/ No. of Samples
Metals - Total				
Antimony	Not Detected		1.0	0 / 1
Arsenic	(b)	10.8	(c)	1 / 1
Beryllium	Not Detected		1	0 / 1
Cadmium	(b)	2.8	(c)	1 / 1
Chromium	(b)	14.2	(c)	1 / 1
Copper	(b)	17.1	(c)	1 / 1
Lead	(b)	72.5	(c)	1 / 1
Manganese	382	395	(c)	2 / 2
Mercury	Not Detected		0.20	0 / 1
Nickel	(b)	11.1	(c)	1 / 1
Selenium	Not Detected		1.0	0 / 1
Silver	Not Detected		2.5	0 / 1
Thallium	Not Detected		1.0	0 / 1
Zinc	(b)	467	(c)	1 / 1
Semivolatile Organic Compounds				
Anthracene	Not Detected		20	0 / 1
Benzyl Alcohol	Not Detected		20	0 / 1
1,2-Dichlorobenzene	Not Detected		20	0 / 1
1,4-Dichlorobenzene	Not Detected		20	0 / 1
2,6-Dinitrotoluene	(b)	32	20	1 / 1
Fluorene	Not Detected		20	0 / 1
2-Methylnaphthalene	(b)	758	20	1 / 1
Naphthalene	Not Detected		20	0 / 1
N-Nitrosodiphenylamine	(b)	14	10	1 / 1
Phenanthrene	(b)	20	20	1 / 1
Pyrene	Not Detected		20	0 / 1

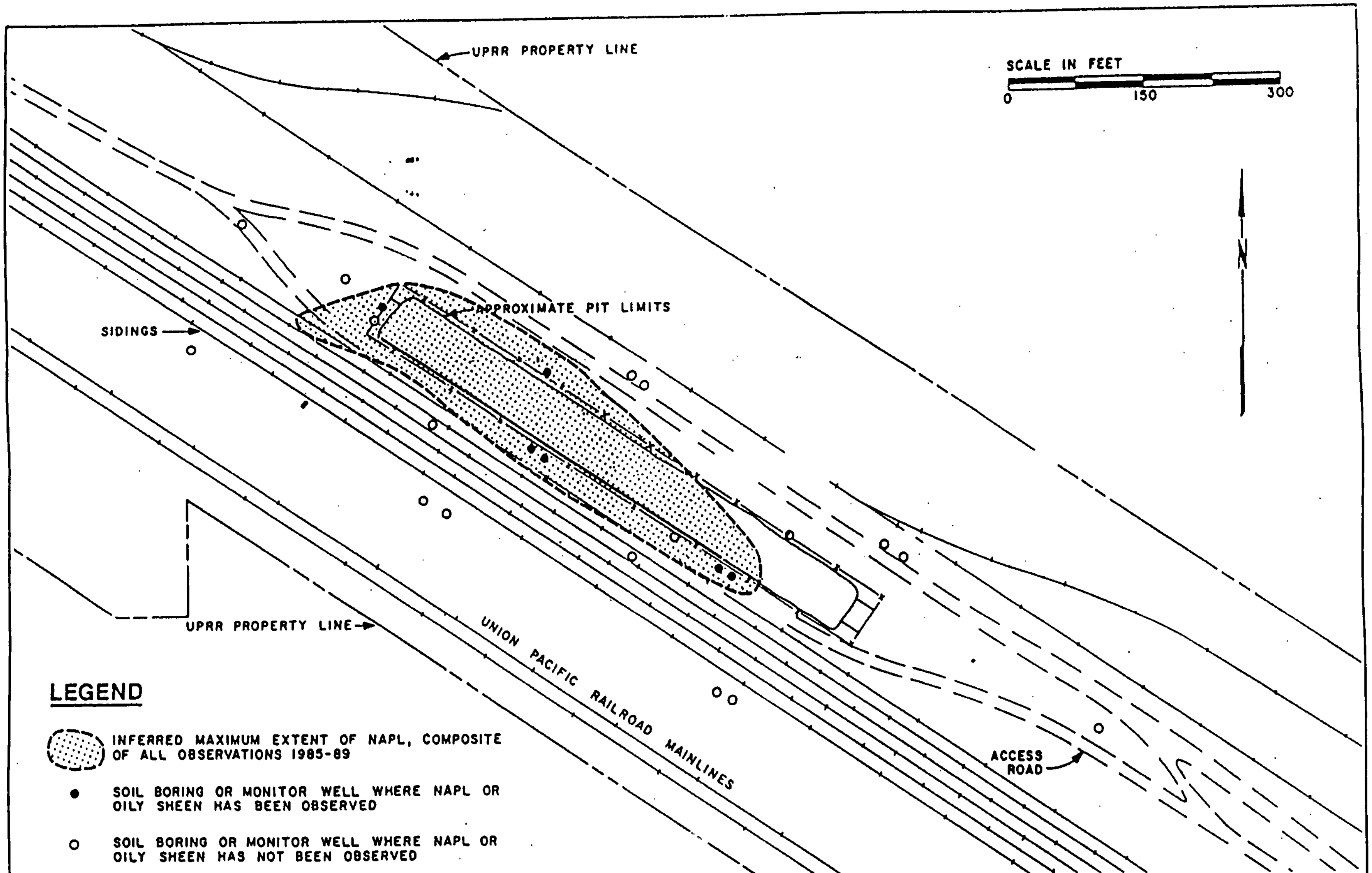
(a) From silt sample in Tables 4.5 and 4.9 in Remedial Investigation report (RI) (AGI, 1990a).
(b) Indicates mean was not calculated because only one result was available.
(c) Indicates detection limit was not provided with data.

TABLE 7

SUMMARY OF VOLATILE CONSTITUENTS
IN SILT UNDERLYING THE SLUDGE PIT (mg/kg) (a)

	Concentration Mean	Maximum	Detection Limit	No. of Detects/ No. of Samples
Volatile Organic Coumpounds				
Acetone	Not Detected		0.01	0 / 1
2-Butanone	Not Detected		0.01	0 / 1
Chlorobenzene	Not Detected		0.005	0 / 1
Chloroform	Not Detected		0.005	0 / 1
Chloromethane	Not Detected		0.01	0 / 1
1,1-Dichloroethane	Not Detected		0.005	0 / 1
t-1,2-Dichloroethene	(b)	0.05	0.005	1 / 1
Ethylbenzene	(b)	2.8	0.005	1 / 1
Methylene Chloride	(b)	0.05	0.01	1 / 1
Toluene	(b)	0.20	0.005	1 / 1
1,1,2,2-Tetrachloroethane	(b)	0.02	0.005	1 / 1
Tetrachloroethene	(b)	1.5	0.005	1 / 1
Trichloroethene	(b)	1.2	0.005	1 / 1
Total Xylenes	Not Detected		0.005	0 / 1

(a) From Table 4.7 in Remedial Investigation report (RI) (AGI, 1990a).
(b) Indicates mean was not calculated because only one result was available.



REFERENCE:
UNION PACIFIC RAILROAD (FORMERLY OREGON SHORT LINE) WEST POCATELLO STATION MAP, CE DRAWING NO. 82799, DATED AUGUST 18, 1977.

INFERRED MAXIMUM EXTENT OF NAPL ON GROUNDWATER
COMPOSITE OF ALL OBSERVATIONS, 1985-1989

UNION PACIFIC RAILROAD - POCATELLO SLUDGE PIT
POCATELLO, IDAHO

FIGURE
3

estimated extent of NAPL floating on the surface of the groundwater, based on observations made from 1985 through 1989.

The sludge pit is located along the southern edge of the Portneuf River Valley where the valley opens to the Snake River Plain. The valley is filled by unconsolidated river sediments and lake deposits that overlie bedrock of primarily volcanic origin.

During subsurface investigations, six distinct stratified, sedimentary rock deposits of common physical character (lithostratigraphic units) were encountered. From youngest to oldest, they are: Fill- loose black cinders, and cinders mixed with silt; Recent Alluvium- stiff, brown silt; Older Alluvium- dense, brown sandy gravel, and dense gray gravel with some sand; Michaud Gravel- dense, brown unsorted mixture of gravel, cobbles, and boulders; American Falls Lake Beds Clay- stiff, light brown silty clay; Pleistocene Gravel- dense, brown sandy gravel.

The relationship between the lithostratigraphic unit (from youngest to oldest) and water bearing deposits (hydrostratigraphic unit) is as follows:

Lithostratigraphic Unit	Hydrostratigraphic Unit
Michaud Gravel	Upper Aquifer (Class IIB)
American Falls Lake Beds Clay	American Falls Lake Beds Aquitard
Pleistocene Gravel	Lower Aquifer (Class I)

A discussion of the aquifer classification (i.e. Class I and Class IIB) requirement can be found in the groundwater ARARs section of the ROD.

Groundwater occurs within the Michaud Gravel between 34 to 38 feet below ground surface (bgs). During the RI, no water supply wells were identified as having been constructed within the Michaud Gravel. The Michaud Gravel does not appear to be of sufficient saturated thickness to be used as a major groundwater source.

The American Falls Lake Beds Clay comprises a major aquitard, a less-permeable layer, which, in many places, hydraulically separates the Upper and Lower Aquifers.

Groundwater occurring under semiconfined conditions in the Pleistocene Gravel comprises the Lower Aquifer. The Lower Aquifer is the shallowest deposit developed extensively for water supply purposes. Most domestic and small commercial wells are completed within the Lower Aquifer, 60 to 150 feet bgs.

Groundwater recharge does not differ significantly between aquifers and probably occurs from direct infiltration of snow melt, irrigation water and precipitation, from potential leakage from aquifer to aquifer, and by infiltration through intermittent streams and the Portneuf River. Groundwater beneath the sludge pit in the Upper Aquifer flows to the northwest, and west to northwest in the Lower Aquifer, down valley toward the American Falls Reservoir. Hydraulic gradients within both aquifers are between 10 to 15 feet per mile. As applied to an aquifer, the hydraulic gradient is the rate of pressure change per unit of distance. Groundwater velocities range from 6.8 to 11 feet per day. Lower Aquifer transmissivity (the rate at which water moves through a unit width of aquifer under a unit hydraulic gradient) is approximately 2,000,000 gallons per day per foot.

During the RI, several sampling events took place from 1985-1989. Both aquifers were sampled for inorganic, organic and other TCL compounds. The wells which were evaluated included seventeen (17) new wells put in by UPRR- nine (9) shallow and eight (8) deep; twenty-four (24) existing wells including six (6) monitor wells installed for the McCarty's/Pacific Hide and Fur Superfund site investigation; five (5) monitor and four (4) production wells on the adjacent Great Western Malting property; and, nine (9) local domestic or industrial supply wells. Table 8 summarizes groundwater sampling results from all RI sampling events and lists current and proposed maximum contaminant levels (MCLs, PMCLs) and maximum contaminant level goals (MCLGs, PMCLGs) for contaminants found.

Upper and Lower Aquifer water samples from 1985 and 1986 samplings contained low concentrations of the heavy metals found in the sludge. All detectable metals had concentrations below primary drinking water MCLs. A contaminant of concern in the groundwater is manganese with maximum concentrations ranging from 0.2-1.82 mg/l. These concentrations exceed the secondary drinking water standard for manganese of 0.05 mg/l.

Various TCL semivolatile compounds were detected in 1985, 1986, and 1988 in Upper Aquifer wells near the sludge pit. No TCL semivolatile compounds were detected in 1989. Semivolatile compound occurrence and distribution indicate the presence of a small, seasonal contaminant plume associated with the NAPL.

Several chlorinated volatile organic compounds, primarily trichloroethene (TCE) and tetrachloroethene (PERC), were detected in most Upper and Lower Aquifer monitor wells and in several water supply wells in September 1988 and April 1989. These compounds were not detected in the 1985 and 1986 sampling rounds. These compounds were, however, detected in a 1983 EPA sampling of area water supply wells.

April 1989 sampling results indicated the presence of PERC at concentrations of less than 1 part per billion (ppb) in both the Upper and Lower Aquifers near the sludge pit.

TABLE 8

ARAR SUMMARY OF CHEMICAL CONSTITUENTS
REPORTED IN UPPER AND LOWER AQUIFER (mg/l)
(BASED ON DATA FROM ALL SAMPLING EVENTS)

Chemical Class	Upper Aquifer non-NAPL Wells (a) Concentration		Upper Aquifer NAPL Wells (b) Concentration		Lower Aquifer (c) Concentration		Applicable or Relevant and Appropriate Requirements (ARARs)			
	Mean	Maximum	Mean	Maximum	Mean	Maximum	Current MCL (d)	Proposed MCL	Current MCLGs (d)	Proposed MCLGs
Metals – Total										
Antimony	0.0044	0.0213	0.0035	0.0085	ND	ND	None	0.01/0.005(g)	None	0.003 (g)
Arsenic	0.0089	0.0283	0.0033	0.0059(J)	0.0019	0.002	0.05	NP	None	NP
Beryllium	0.0025	0.0025(h)	0.002	0.0025(h)	0.0023	0.0025(h)	None	0.001 (g)	None	0 (g)
Cadmium	0.0003*	0.0008*	ND*	ND*	0.0003*	0.0006*	0.005		0.005	
Chromium	0.008	0.02	0.0139	0.0256	0.0066	0.0145	0.1		0.1	
Cobalt	0.0106	0.0133	0.0084	0.01(h)	ND	ND	None	NP	None	NP
Copper	0.019	0.03	0.0097	0.01(h)	0.0251	0.08	1.0 (S)	1.3 (f)	None	1.3 (e)
Lead	0.0046	0.010	0.004	0.0079(J)	0.0077	0.0282(J)	0.05	0.005 (f)	0.05 (f)	0.015
Manganese	0.71	1.82	0.107	0.2	0.141	0.55	0.05 (S)	NP	None	NP
Mercury	0.00015	0.00042(J)	0.00003	0.0001(h)	0.0002	0.0007(J)	0.002		0.002	
Nickel	0.022	0.05	0.019	0.03	0.0099*	0.01*(h)	None	0.1 (g)	None	0.1 (g)
Selenium	0.0011	0.0014(R)	0.0011	0.0014(R)	0.001*	0.0012*(R)	0.05		0.05	
Silver	0.0044	0.005(h)	0.0055	0.01	ND	ND	0.05	0.1 (S)(d)	None	NP
Thallium	0.0013	0.0028(R)	0.0016	0.0028(R)	0.0012	0.0023(R)	None	0.002/0.001(g)	None	0.0005 (g)
Vanadium	0.012	0.0225	0.0077	0.0132	0.0062	0.0121	None	NP	None	NP
Zinc	0.082*	0.12*	0.08*	0.12*	0.0925*	0.15*	5 (S)	NP	None	NP
Volatile Organic Compounds										
Benzene	ND	ND	ND	ND	0.0011	0.0042	0.005	NP	0	NP
Chlorobenzene	ND	ND	ND	ND	0.00084	0.0025(h)	0.10	NP	0.10	NP
Chloroform	ND	ND	0.001	0.0025(h)	ND	ND	0.1	NP	NP	NP
1,1-Dichloroethane	0.00055	0.0025(h)	ND	ND	ND	ND	None	NP	None	NP
1,1-Dichloroethene	0.00052	0.0025(h)	ND	ND	ND	ND	0.007	NP	0.007	NP
trans-1,2-Dichloroethene	0.0006	0.0025(h)	0.00126	0.003	ND	ND	0.10		0.10	
cis-1,2-Dichloroethene	0.0002	0.0003	ND	ND	ND	ND	0.07		0.07	
Methylene Chloride	ND	ND	0.0017	0.005	ND	ND	None	0.005 (g)	None	0 (g)
Tetrachloroethene	0.00090	0.0025(h)	0.0011	0.0025(h)	0.00192	0.0025(h)	0.005		0	
Toluene	ND	ND	ND	ND	0.00094	0.0025(h)	1		1	
Trichloroethene	0.00062	0.0025(h)	0.0009	0.0025(h)	0.00069	0.0025(h)	0.005	NP	0	NP
Total Xylenes	ND	ND	ND	ND	0.00169	0.0076	10		10	
Semivolatile Organics										
Acenaphthene	ND	ND	0.0058	0.021	0.0024	0.01(h)	None	NP	None	NP
Benzo(a)Anthracene	ND	ND	0.0050	0.018	ND	ND	None	0.0001 (g)	None	0 (g)
Benzo(b)Fluoranthene	ND	ND	0.0043	0.01(h)	ND	ND	None	0.0002(g)	None	0 (g)
Benzo(g,h,i)Perylene	ND	ND	0.0037	0.01(h)	ND	ND	None	NP	None	NP
Chrysene	0.0029	0.01(h)	0.0043	0.01(h)	ND	ND	None	0.0002(g)	None	0 (g)
Fluoranthene	ND	ND	0.0042	0.01(h)	ND	ND	None	NP	None	NP
Pyrene	ND	ND	0.0056	0.028	ND	ND	None	NP	None	NP
1,3-Dichlorobenzene	ND	ND	0.0158	0.11	ND	ND	None	NP	None	NP
di-n-Octylphthalate	0.0044	0.01(h)	0.0054	0.012(J)	0.0070	0.053	None	NP	None	NP
bis(2-ethylhexyl) Phthalate	0.0043	0.01(J)	0.0048	0.014	0.0031	0.012(J)	None	0.004 (g)	None	0 (g)

(a) Data summarized from Table 2-7 (HHRA)
(b) Data summarized from Table 2-8 (HHRA)
(c) Data summarized from Table 2-9 (HHRA)
(d) 40CFR 141 and 143, and 56FR3526
(e) 54FR 22062
(f) 53FR 31516
(g) 55FR 30370
(h) Value is one-half the highest detection limit.
ND Not Detected
NP Not Proposed
S Secondary Standard
J – Value flagged as estimated in RI.
R – Value flagged as rejected in RI (AGI, 1990a); however value was used to conservatively estimate risks.
* Indicates 1986 data for dissolved metals exceeds 1988 (shown) total metal concentration.

The distribution of TCE in the April 1989 sampling indicates low concentrations (less than 1 ppb) in the Upper Aquifer and none in the Lower Aquifer near the sludge pit or in the residential water supply wells northwest of the pit.

D. Surface Water

Several surface water bodies are present in the study area. Those identified in the RI included the Portneuf River, an irrigation canal, intermittent ponds in the gravel pit southwest of the sludge pit, and water observed in the sludge pit. The Portneuf River appears to be perched above groundwater in the study area. The nearest springs are close to the Portneuf River, approximately two miles northwest of the sludge pit.

Based on City of Pocatello Flood Potential maps, the sludge pit is not located within the 100-year flood plain of the Portneuf River.

No surface water bodies transect the sludge pit, however, surface runoff occurs during storm events and snowmelt. No significant drainage rills were observed onsite indicating predominant drainage patterns. The pit is protected from runon and runoff by a surrounding berm. The sludge pit surface is generally level and is depressed approximately one to two feet below the surrounding land surface. The sludge pit appears to be capable of retaining rainfall from significant storm events without overflowing. Additionally, based on characteristics of surface soils on the site property, surface water likely infiltrates rapidly into areas where the stiff, brown silt (Recent Alluvium) is absent.

VI. SUMMARY OF SITE RISKS

A Human Health Risk Assessment (HHRA) (AGI, 1990a) and an Environmental Risk Assessment (ERA) (AGI, 1990b) were performed to estimate the potential for adverse human health and environmental effects from exposure to contaminants associated with the site. The Human Health Risk Assessment followed a four step process: 1) identification of contaminants which are of significant concern, 2) an exposure assessment which identified current and potential exposure pathways and exposed populations, and quantified current and potential exposure, 3) identification of the type of toxic effects associated with contaminant exposure and identification of toxicity constants to estimate these effects, and 4) a risk characterization, which integrated the three earlier steps to summarize the potential and current risks posed by hazardous substances at the site. The results of the Human Health Risk Assessment and Environmental Risk Assessment are discussed below.

Analyses of the sludge, soil, and groundwater indicate that exposure to these media may pose a threat to onsite workers, the community and the environment at the Union Pacific Railroad site, particularly if, during remedial activities, sludge, silt and soil are removed but dust control measures are not implemented or fail. Available data indicates that surface water flow is not a primary contaminant pathway.

Current land use is strictly industrial and has been since before the turn of the century. The likelihood of a change in current land use in the foreseeable future is extremely low. However, the closest residential area is 0.3 mile from the site. Therefore, reasonable maximum exposure (RME) was calculated for both residential and industrial scenarios. A combined exposure scenario was used to calculate risk-based goals. A detailed discussion of this procedure can be found in the section entitled Human Health Risks.

Current groundwater use indicates that the Lower Aquifer is very productive and is used as a drinking water source by local, private residents, businesses, and the City of Pocatello (Supply Well No. 32). No water supply wells in the area have been found to utilize the Upper Aquifer, which is contaminated with chemicals that have migrated downward from the sludge, through the silt and soil, to the groundwater surface.

Figures 4 and 5 depict exposure points for an onsite worker and an offsite resident using the current land use scenario and a potential future land use scenario, respectively.

Potential future onsite residential and industrial worker populations are at risk from ingestion and dermal exposure to contaminants in the sludge pit, and secondarily from exposure through ingestion of contaminated groundwater if used as a drinking water supply.

HUMAN HEALTH RISKS

Identification of Contaminants of Concern. A total of 58 contaminants (19 volatile organics, 23 semivolatile organics, and 16 metals) were identified in sampling of sludge, soil, water, and NAPL. At least 20 additional compounds were also tentatively identified. All chemicals positively identified and for which toxicity constants exist were included in the risk assessment. Tables 3-5, 3-8, 3-9, 3-10, and 3-11 in the HHRA list, for each media, the chemicals quantitatively evaluated in the risk assessment with their mean and maximum concentration.

Exposure Assessment. Potential human health effects resulting from exposure to site contaminants were estimated for each of several known and potential exposure pathways. These pathways were developed based on current industrial and residential

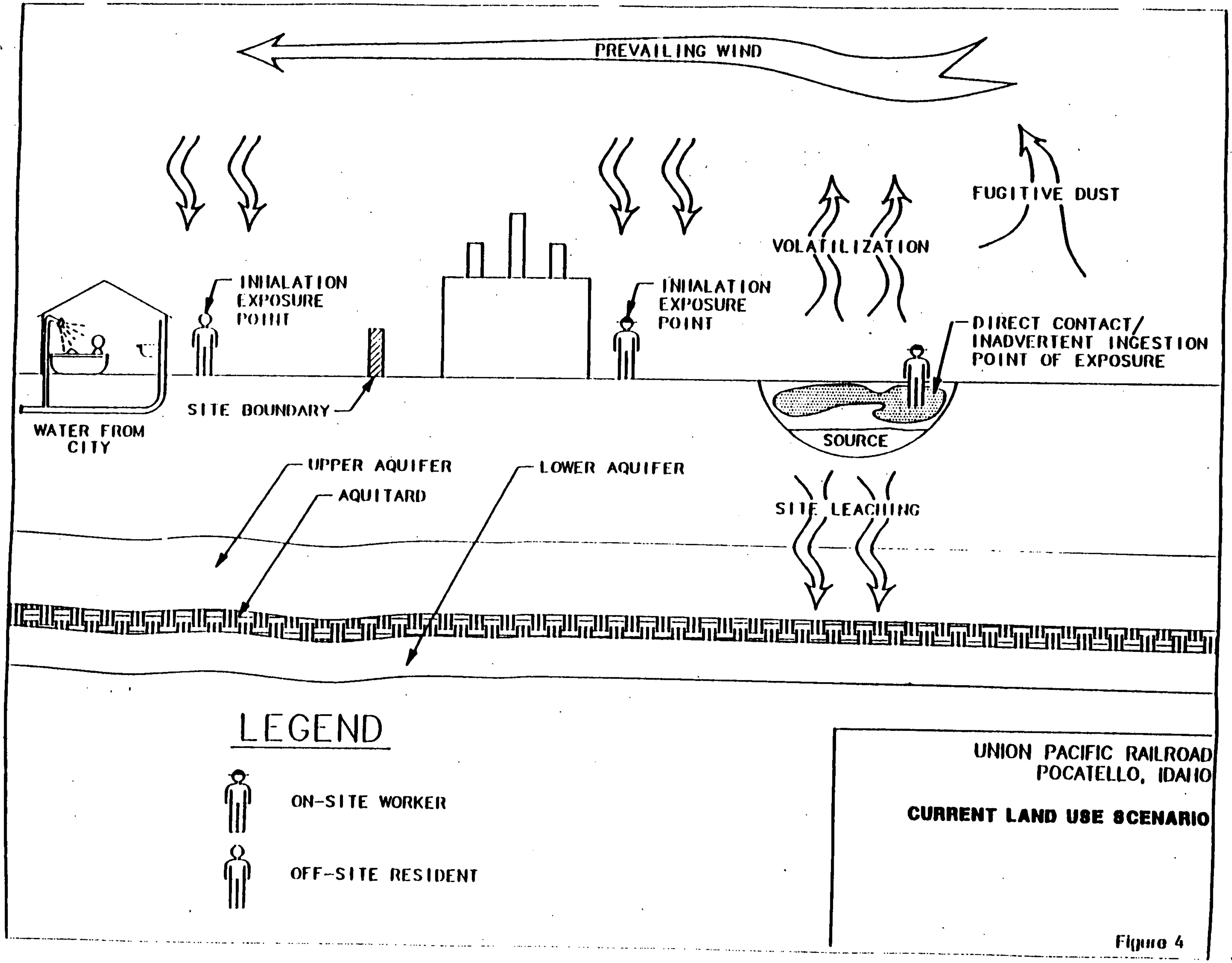
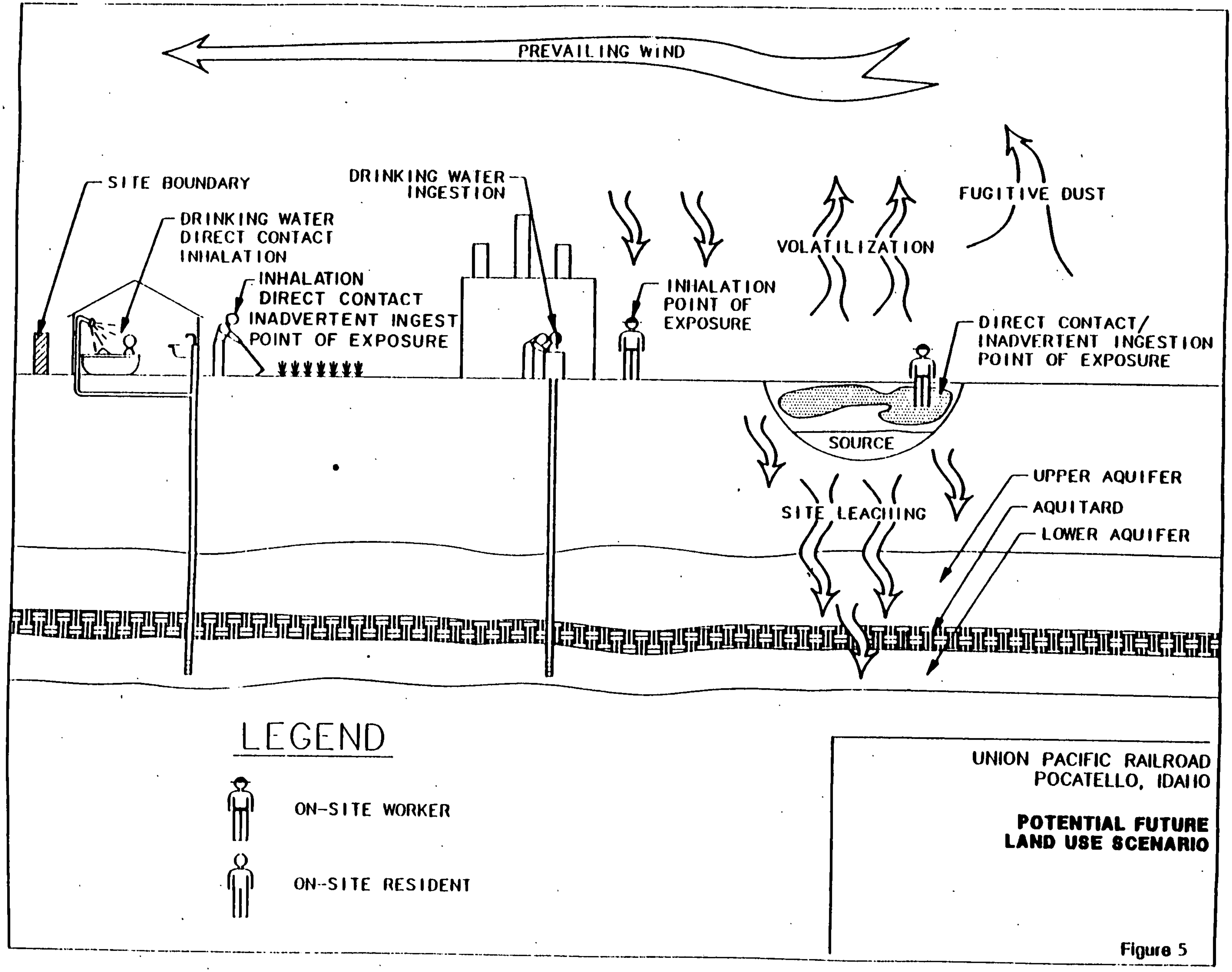

PREVAILING WIND
FUGITIVE DUST
VOLATILIZATION
INHALATION EXPOSURE POINT
INHALATION EXPOSURE POINT
DIRECT CONTACT/ INADVERTENT INGESTION POINT OF EXPOSURE
SITE BOUNDARY
WATER FROM CITY
SOURCE
UPPER AQUIFER
AQUITARD
LOWER AQUIFER
SITE LEACHING
LEGEND
ON-SITE WORKER
OFF-SITE RESIDENT
UNION PACIFIC RAILROAD
POCATELLO, IDAHO
CURRENT LAND USE SCENARIO

Figure 4



UNION PACIFIC RAILROAD
POCATELLO, IDAHO

POTENTIAL FUTURE LAND USE SCENARIO

Figure 5

activities in the vicinity of the sludge pit, and likely future uses given the nature and location of the site. The following is a brief summary of exposure pathways evaluated and assumptions used in the assessment. A more thorough description can be found in Section 3.3 of the Human Health Risk Assessment (pp. 3-3 to 3-5).

Soil Ingestion. It was assumed that both children and adults inadvertently ingest soil (0.1 and 0.2 gm/day, respectively) over exposure periods from one day to a lifetime (75 years), at varying frequencies (1 to 365 days/year).

Dermal Contact. Absorption of contaminants via dermal contact with soil was evaluated for both children and adults using the same exposure periods and frequencies as for soil ingestion, adjusting for age-specific differences in body surface area.

Water Consumption. It was assumed that groundwater at the site is used as a drinking water source. Consumption of groundwater from both the Lower (deep) and Upper (shallow) Aquifers (separately for NAPL and non-NAPL containing wells) was estimated for children and adults using age-specific consumption rates (0.83 - 2.0 liters/day) at varying frequencies.

Inhalation of Particulates and Volatiles. Air concentrations of particulate matter and volatile organics originating in the sludge pit were estimated using emissions and dispersion modeling in the HHRA. Exposure to particulates and volatiles was subsequently reassessed by EPA as described in the Administrative Record for the ROD. The document appears in Section 6.0 Enforcement/Subsection 6.4 Risk Assessments- Human Health, Environmental/Sub-subsection 6.4.2 Air Pathway Reassessment and Supporting Documentation. Inhalation exposures to children and adults were considered using varying inhalation rates (20-30 m^3/day) and exposure frequencies.

Inhalation of Volatiles from Drinking Water. Inhalation of volatile organic contaminants which could volatilize from drinking water during showering or bathing was estimated for children and adults using a conversion factor to predict inhalation exposure from estimated drinking water exposure.

Ingestion of NAPL. Exposure to contaminants in NAPL was estimated assuming a child was to inadvertently ingest 0.53 to 1.0 liter of NAPL a single time.

Vegetable Consumption. Contaminants in sludge could accumulate in vegetables grown in sludge or sludge-amended soil. Cadmium uptake in vegetables and subsequent exposure via ingestion was estimated assuming contaminated, homegrown vegetables were consumed during both child- and adulthood. Exposure via contaminated vegetable consumption to other contaminants in sludge (which are less likely to accumulate in vegetables) is discussed qualitatively.

For each pathway evaluated, an average and reasonable maximum exposure (RME) estimate was generated for short-term (subchronic) and long-term (chronic) exposure. Average estimates are based on average media concentrations and exposure parameters, and reasonable maximum exposure estimates are based on maximum media concentrations and RME exposure parameters. Standard default exposure parameters developed in 1990 by EPA Region 10 were used to develop estimates of exposure for current and future site uses. These are slightly more conservative than national default values which were established following completion of this assessment. Default assumptions may not accurately reflect current site exposures, as discussed further in the **Uncertainties** section.

Toxicity Assessment

Cancer Risks. Excess lifetime cancer risks were determined for each exposure pathway by multiplying the exposure level by the chemical-specific cancer slope factor. Tables 5-2 and 4-2 in the HHRA summarize carcinogenic effects and cancer potency factors, respectively, for site contaminants. Chemical-specific cancer potency (slope) factors have been developed by EPA from human epidemiological or animal studies. This information was obtained from the Integrated Risk Information System (IRIS) and the Health Effects Assessment Summary Tables (HEAST). Risk estimates calculated from these potency factors reflect a conservative "upper bound" of the risk posed by potentially carcinogenic compounds. That is, the true risk is very unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation (i.e. 1×10^{-6} or 1.0E-06 for 1/1,000,000; indicating that, in this example, an individual is not likely to have greater than a one in one million chance of developing cancer over his/her lifetime as a result of site-related exposure). Current EPA practice assumes carcinogenic risks are additive between chemicals when assessing exposure to a mixture of hazardous substances. Therefore, cancer risks have been summed across chemicals and across exposure pathways.

Noncancer Risks. Tables 5-1 and 4-1 in the HHRA summarize noncarcinogenic effects and reference doses for site contaminants, respectively. A hazard index was calculated for each pathway as EPA's measure of the potential for noncarcinogenic health effects. The hazard index is calculated by dividing the human dose by the reference dose (RfD) or other suitable benchmark for noncarcinogenic health effects. Reference doses have been developed by EPA to protect sensitive individuals over varied exposure durations (subchronic: up to 7 years, and chronic: 7 years to a lifetime). They reflect a daily exposure level that is likely to be without an appreciable risk of an adverse health effect. RfDs are derived from epidemiological or animal studies and incorporate uncertainty factors to help ensure that adverse health effects will not occur. This information was obtained from IRIS and HEAST. The hazard index is often expressed as a single value indicating the ratio of the estimated human exposure to the reference dose value (i.e. 0.3 in this example, indicating the exposure is approximately one third of the reference dose for the given compound). Adverse health effects are not expected to occur if the hazard index is less than 1. As the hazard index increases above 1, adverse effects become more likely. The hazard index is only considered additive for compounds that have the same or similar toxic endpoints. For example, the hazard index for a compound known to produce only liver damage would not be added to another compound whose toxic endpoint is predominantly nerve damage.

Risk Characterization. Carcinogenic risks from current and future exposure assuming residential and industrial land use are listed in Tables 5-3 to 5-10, and 5-13 to 5-17 in the HHRA. Noncarcinogenic risks from current and future exposure, assuming residential and industrial land use, are listed in Tables 5-3 to 5-8, 5-11 to 5-13, 5-15, 5-18, and 5-19 of the HHRA.

Table 9 summarizes **risk by scenario and toxicity endpoint** for the reasonable maximum exposure. Cancer and noncancer (subchronic and chronic) risks are high (i.e. greater than 10^{-4} cancer risk and hazard index greater than 1.0) in all scenarios. Risks are greatest assuming future residential land use, however, differences in risk between scenarios are not great, and vary by a factor of 0 to 7.

Table 10 displays cumulative **risk by medium and pathway.** Risk from exposure to each media (soil/sludge, Lower Aquifer wells, Upper Aquifer NAPL wells, Upper Aquifer non-NAPL wells) is significant (e.g. greater than 10^{-2} cancer risk; hazard index greater than 1.0) for cancer and noncancer endpoints. Exposure to soil/sludge appears to present the greatest risk [e.g. cancer risk of 4 x 10^{-2} vs. 2 x 10^{-2} (Upper Aquifer) to 5 x 10^{-4} (Lower Aquifer)] and ingestion pathway risks are the highest, about an order of magnitude greater than dermal contact and inhalation.

Table 11 identifies **chemicals of greatest risk** in each media for both cancer and noncancer effects. Metal contaminants present the highest noncancer risks for the contaminated sludge and soil, primarily arsenic, cadmium, and chromium; although this may reflect the relative lack of reference doses for organic contaminants identified at the site. Far more contaminants (organics and metals) present a significant cancer risk. The

TABLE 9. TOTAL RISK BY SCENARIO AND TOXICITY ENDPOINT (a)

Risk Endpoint	Current Residential	Future Residential	Current Industrial	Future Industrial	Future Residential and Industrial
Cumulative Cancer Risk	2.6E-06	2.0E-02	4.3E-02	4.5E-02	6.6E-02
Chronic Cumulative Hazard Index	0.006	5	8	12	17
Subchronic Cumulative Hazard Index	0.02	10	0.2	3	13

(a) Totals are based on the reasonable maximum exposure case Groundwater risks are based on cumulative cancer risks and hazard indices of Upper Aquifer Non-NAPL wells; risks are essentially equivalent for lower Aquifer and Upper Aquifer-NAPL water sources.

TABLE 10. CUMULATIVE RISK BY MEDIUM AND PATHWAY (a)

	SOIL/SLUDGE				GROUNDWATER								
					LOWER AQUIFER			UPPER AQUIFER, NON-NAPL WELLS			UPPER AQUIFER, NAPL WELLS		
	Ingestion	Dermal Contact	Inhalation (Volatiles + Part.	TOTAL	Ingestion	Inhalation	TOTAL	Ingestion	Inhalation	TOTAL	Ingestion	Inhalation	TOTAL
Cancer Risk	3.8E-02	2.0E-02	1.4E-05	3.8E-02	6.6E-04	3.2E-05	6.9E-04	7.9E-03	9.5E-06	7.9E-03	2.3E-02	6.0E-05	2.3E-02
Chronic Noncancer Hazard Index	8	0.4	0.04	8	3	0.5	4	9	0.003	9	5	0.001	5
Subchronic Noncancer Hazard Index	1	0.5	0.1	2	1	0.06	2	11	0.001	11	4	0.003	4

(a) Based on combined future residential and industrial risks, for the reasonable maximum exposure case.

TABLE 11. CHEMICALS OF GREATEST RISK BY MEDIA (a)

CANCER RISKS:

Soil/Sludge

Compound	Cancer Risk (b)
Benzo(k)Fluoranthene	1.6E-02
Benzo(a)Anthracene	1.2E-02
Chrysene	1.2E-02
Benzo(a)Pyrene	8.6E-03
Indeno(1,2,3-cd)Pyrene	6.1E-03
2,6-Dinitrotoluene	1.5E-03
Arsenic	1.2E-03
Beryllium	1.5E-04
Tetrachloroethene	1.3E-04
1,1-Dichloroethane	3.4E-05
Methylene Chloride	3.3E-05
Trichloroethene	3.1E-05
n-Nitrosodiphenylamine	1.2E-05
1,4-Dichlorobenzene	1.1E-05
1,1,2,2-Tetrachloroethane	8.8E-06
Chloromethane	2.4E-06

Lower Aquifer

Compound	Cancer Risk (b)
Beryllium	5.00E-04
Arsenic	1.42E-04
Benzene	2.81E-05
Trichloroethene	9.28E-06
bis(2-ethylhexyl)Phthalate	7.88E-06
Tetrachloroethene	7.44E-06

Upper Aquifer, Non-NAPL Wells

Compound	Cancer Risk (b)
Chrysene	5.35E-03
Arsenic	1.98E-03
Beryllium	5.04E-04
1,1-Dichloroethene	6.99E-05
1,1-Dichloroethane	1.07E-05
Trichloroethene	9.28E-06
Tetrachloroethene	7.44E-06
bis(2-ethylhexyl)Phthalate	6.53E-06

Upper Aquifer, NAPL Wells

Compound	Cancer Risk (b)
Benzo(a)Anthracene	9.65E-03
Chrysene	5.35E-03
Benzo(b)Fluoranthene	5.35E-03
Methylene Chloride	1.21E-03
Beryllium	5.04E-04
Arsenic	4.15E-04
1,3-Dichlorobenzene	1.23E-04
Chloroform	3.81E-05
Trichloroethene	9.24E-06
bis(2-ethylhexyl)Phthalate	9.19E-06
Tetrachloroethene	7.48E-06

TABLE 11 (contd). CHEMICALS OF GREATEST RISK BY MEDIA (a)

CHRONIC RISKS

Soil Sludge

Chemical	Chronic Hazard Index (b)
Cadmium	2.2E+00
Chromium	1.5E+00
Arsenic	1.4E+00
Antimony	4.3E-01
Tetrachloroethene	4.2E-01
Zinc	4.0E-01
t-1,2 dichloroethene	3.9E-01
Vanadium	3.4E-01

Lower Aquifer

Compound	Chronic Hazard Index (c)
Thallium	1.97E+00
Benzene	4.37E-01

Upper Aquifer, Non-NAPL Wells

Compound	Chronic Hazard Index (c)
Antimony	3.19E+00
Thallium	2.40E+00
Arsenic	1.70E+00
Manganese	5.46E-01

Upper Aquifer, NAPL Wells

Compound	Chronic Hazard Index (c)
Thallium	2.40E+00
Antimony	1.27E+00
Arsenic	3.54E-01
Chromium	3.07E-01

SUBCHRONIC RISKS

Soil Sludge

Chemical	Subchronic Hazard Index (b)
Arsenic	5.3E-01

Lower Aquifer

Compound	Subchronic Hazard Index (c)
Thallium	3.68E-01

Upper Aquifer, Non-NAPL Wells

Compound	Subchronic Hazard Index (c)
Antimony	5.96E+00
Arsenic	3.17E+00
Thallium	4.48E-01
Manganese	4.07E-01
Vanadium	3.60E-01

Upper Aquifer, NAPL Wells

Compound	Subchronic Hazard Index (c)
Antimony	2.38E+00
Arsenic	6.60E-01
Thallium	4.48E-01

(a) This table presents cancer risk greater than or equal to 1E-06 and hazard indices greater than or equal to 0.3, based on combined risks for the future residential and industrial scenarios for the reasonable maximum exposure case.
(b) Represents the total of inhalation, ingestion, and direct contact.
(c) Represents the total of inhalation and ingestion.

largest number of contaminants of concern are in soil/sludge, followed by Upper Aquifer wells (NAPL, then non-NAPL) and finally, Lower Aquifer wells. Arsenic and beryllium have cancer risks greater than 10^{-4}. Several PAHs and 2,6-dinitrotoluene have cancer risks greater than 10^{-4}.

Uncertainties. In general, the uncertainty associated with these results is large, spanning an order of magnitude or more. Specific factors which contribute to the uncertainty in this assessment are as follows.

Analytical data. Site risk is estimated based on limited sampling of soil, sludge, and groundwater (e.g. metals are evaluated based on a single round of sampling). Interferences in highly contaminated samples may have precluded identification of some contaminants. A number of tentatively identified compounds (TICs) were present in some samples, but could not be definitively identified and were, therefore, not included in the quantitative assessment.

Exposure Assessment. Two key factors contributed a great deal of uncertainty to the exposure assessment. First, few studies are available from which to estimate exposure to contaminants by dermal contact, especially in soil. Second, chemical-specific absorption rates have only been developed for a few compounds (e.g. PAHs), therefore, conservative default values were used. This leads to significant uncertainty in the exposure assessment results, particularly for metals, which are generally poorly absorbed. EPA believes that dermal pathway exposure and risk estimates are, therefore, quite conservative. Since the basis for these estimates is so uncertain and conservative, and since guidance for conducting dermal assessments is just now being developed, this exposure pathway will not be included in developing risk-based cleanup goals as discussed later in this document.

Another major area of uncertainty arises from the use of other default exposure parameters. The most obvious effect of using these assumptions is on estimates of current onsite exposure. Pathways contributing most to current onsite exposure are inadvertent ingestion and dermal contact with sludge. While site-specific data regarding the frequency of time people are in contact with the sludge/soil is sparse, information gathered during the Remedial Investigation and during EPA site visits indicate that:

- there are no buildings, facilities, work-related or other activities in the immediate vicinity of the sludge pit, other than the railroad tracks,

- the terrain is essentially level and there are no topographic or other features nearby (e.g. ponds) which would encourage recreational or other types of exposure,

- the pit is surrounded by a barbed wire fence.

This information indicates that exposure to sludge/soil is infrequent. The standard default assumption used to estimate exposure from soil ingestion and dermal exposure is 131 days/year (36%) for 40 years. This frequency could be more than an order of magnitude above actual exposures, and these uncertainties must be carefully considered when interpreting current exposure and risk estimates.

Other factors in the exposure assessment which contributed to uncertainty include the absence of data to validate exposure modeling (e.g. particulate and volatile emissions; showering exposure), limited exposure point concentration data, and the use of standard default exposure parameters in general.

Risks associated with consumption of groundwater from both NAPL and non-NAPL contaminated Upper Aquifer wells appear to be relatively high. However, no drinking water wells in the area are in place in the Upper Aquifer and the likelihood of future wells completed in the Upper Aquifer is low. The area's reliance on the Lower Aquifer for drinking water is primarily due to the low productivity of the Upper Aquifer. Even though NAPL has not been identified in the Lower Aquifer, the Upper and Lower Aquifers appear to be hydraulically connected, consequently, migration of the NAPL to the Lower Aquifer could be possible and could affect water quality.

Toxicity. Toxicity constants were not available for many contaminants (e.g. TICs; RfDs for many organics) nor for the dermal exposure route (e.g. oral toxicity constants were used instead to estimate dermal pathway risks). As a result, risk estimates presented here represent a subset of site risks. In addition, noncancer risks have not been separated by toxic endpoint, resulting in a conservative noncancer risk estimate. The results could be different if chemicals are grouped by toxic endpoint prior to calculating the hazard index.

The degree of over- or underestimation and magnitude of these combined uncertainties is difficult to determine. Therefore, results of the assessment should be viewed as order of magnitude estimates (e.g. 10^{-3} vs. 10^{-4}) at best.

ENVIRONMENTAL RISKS

Exposure Assessment. Wildlife habitats near the sludge pit are limited in extent and of low quality because of current and historical land use. However, contamination in surface water or groundwater may pose potential risks to aquatic and terrestrial wildlife.

Birds and small mammals may be attracted to the sludge pit during periods of standing water after heavy rains or snowmelt. It appears unlikely that contaminants from the sludge pit would enter the Portneuf River via overland flow. Two potential release pathways were identified: (1) ephemeral surface water within the sludge pit that may contain contaminants leached from the sludge, and (2) groundwater transport of contaminants via the Upper Aquifer to the Portneuf River.

EPA contacted the U.S. Department of the Interior (DOI) which includes the U.S. Fish and Wildlife Service, requesting that they conduct a preliminary natural resource survey of the site. The survey enabled them to determine whether their natural resource trust responsibilities were involved. Their assessment concluded that neither releases from the site nor the site itself affect any lands, minerals, waters, plants, animal species or Indian resources managed or protected by DOI. Concomitantly, EPA determined that no critical habitats, nor any endangered species or habitats of endangered species are known to be affected by site contamination.

Exposure Point Concentrations. Exposure to surface water and groundwater was estimated using average and maximum values, found in Tables 2-3 and 2-10 in the ERA, respectively. Surface water exposure concentrations were assumed equivalent to toxicity characteristic leaching procedure (TCLP) test data for sludge samples. These values were used when estimating risks associated with ingestion or direct contact with pooled water. Upper Aquifer water quality data were used to represent exposure point concentrations for aquatic life. No dilution or differential flow rates were assumed to occur between source and point of exposure.

Toxicity Assessment. Indicator species of animals were identified to assess effects on small mammals and avian species due to contacting or ingesting contaminants. Data included a broad range of exposure effects on as many life stages as possible in both the short- and long-term. A detailed discussion can be found in Chapter 4 of the Environmental Risk Assessment.

Potential phytotoxicity was not evaluated quantitatively due to the physical and chemical unsuitability of the sludge as a substrate to support plant growth. Plants were not identified as potentially important environmental receptors at this site.

Aquatic toxicity endpoints were selected to give a broad characterization of potential adverse effects on the life stages of each organism. Species were selected to represent fish, insects, crustaceans, and plants. Table 12 summarizes the potentially adverse aquatic effects of site contaminants. Bioconcentration is reported to occur in some classes of organisms for most metals detected onsite. At higher trophic levels, volatile and semivolatile organic compounds are the most likely to bioconcentrate.

Risk Characterization. Hazard indices (HIs) were calculated by dividing the exposure intake values by their respective toxicity endpoint. Potential adverse aquatic effects were assessed by comparison of average and maximum contaminant concentrations with available toxicity endpoint data. Table 13 summarizes the aquatic HIs.

The greatest potential for adverse environmental effects are expected from exposure to high concentrations of metals. Silver has the greatest potential for adverse environmental effects due to estimated concentrations onsite. Copper has the greatest potential for ecosystem damage due to its effects across all trophic levels examined in the assessment. Semivolatile constituents pose a threat to the aquatic ecosystem. Benzo[a]anthracene and pyrene are suspect for effects across trophic levels.

Contaminant concentrations were compared with Ambient Water Quality Criteria (AWQC). Average concentrations were compared with chronic freshwater criteria and maximum concentrations were compared with acute freshwater criteria, as listed in Table 14. Chronic criteria were exceeded by average concentrations of copper, lead, mercury, and silver. Acute criteria were exceeded by maximum concentrations of chromium, copper, silver, and zinc.

Uncertainties. The results of this assessment must be interpreted cautiously due to the general lack of toxicological data for threatened species, and the conservative assumptions used given the lack of surface water concentration data. Likewise, a potential threat to wildlife and aquatic species is indicated, but these results should not be interpreted as predictive.

CONCLUSIONS

Current and potential future residential and industrial worker populations are at risk primarily from ingestion and dermal exposure to contaminants in the sludge pit, and secondarily from exposure through ingestion of contaminated groundwater if used as a drinking water source. Carcinogenic risks which exceed 10^{-4} and noncarcinogenic hazard indices which exceed 1 are estimated

TABLE 12

SUMMARY OF POTENTIALLY ADVERSE AQUATIC EFFECTS

	Fish	Insects	Crustaceans	Plants*
Cadmium			Chronic Toxicity	
Chromium (VI)				Growth
Copper	Lethality	Lethality	Lethality	Physiological
Manganese				Photosynthesis, Enzymatic
Mercury	Chronic Toxicity			
Nickel	Lethality		Chronic Toxicity	
Silver	Chronic Toxicity		Chronic Toxicity	
Zinc	Lethality	Lethality	Lethality	
bis(2-Ethylhexyl) Phthalate	Mortality/ Morphology		Mortality	
Chrysene				Physiological
1,3-Dichlorobenzene				Photosynthesis
Benzo(a)Anthracene	Lethality		Lethality	Growth
Pyrene	Lethality	Lethality	Reproduction	Biochemical

* Includes blue-green algae

TABLE 13

SUMMARY OF AQUATIC HAZARD INDICES

Chemical	Species Type	Hazard Index @ Avg Conc.	Hazard Index @ Max Conc.
Cadmium	Water flea	3.8E+00	1.0E+01
Chromium	Algae	1.0E+00	2.6E+00
Chromium	Blue-green Algae	5.0E+00	1.3E+01
Copper	Trout	8.4E-01	1.6E+00
Copper	Water flea	6.4E+01	1.2E+02
Copper	Water flea	1.1E+01	2.1E+01
Copper	Midge	9.8E-01	1.8E+00
Copper	Green Algae	3.1E+00	5.9E+00
Manganese	Water Weed	1.1E+01	4.0E+01
Manganese	Algae	9.3E-01	3.3E+00
Mercury	Fathead Minnow	5.7E-01	1.8E+00
Mercury	Trout	4.5E-01	1.4E+00
Nickel	Trout	4.2E-01	1.0E+00
Nickel	Water flea	2.1E+00	4.9E+00
Silver	Fathead Minnow	1.3E+00	2.6E+00
Silver	Trout	9.4E-01	1.9E+00
Silver	Trout	5.6E+01	1.1E+02
Silver	Water flea	2.0E+01	4.0E+01
Silver	Water flea	3.1E+00	6.3E+00
Zinc	Trout	8.9E-01	1.3E+00
Zinc	Water flea	5.7E+00	8.6E+00
Zinc	Water flea	1.6E+01	2.4E+01
Zinc	Midge	2.2E+00	3.2E+00
1,3-Dichlorobenzene	Algae	4.0E-01	5.0E+00
Benzo(a)Anthracene	Fathead Minnow	1.9E+00	1.0E+01
Benzo(a)Anthracene	Water flea	3.5E-01	1.8E+00
Benzo(a)Anthracene	Water flea	1.9E+00	1.0E+01
Benzo(a)Anthracene	Blue-green Algae	4.2E+01	2.2E+02
Benzo(a)Anthracene	Blue-green Algae	7.0E-01	3.6E+00
Bis(2-Ethylhexyl)Phthalate	Fathead Minnow	4.3E-01	1.3E+00
Bis(2-Ethylhexyl)Phthalate	Trout	9.4E-01	2.8E+00
Bis(2-Ethylhexyl)Phthalate	Trout	1.3E+00	3.8E+00
Bis(2-Ethylhexyl)Phthalate	Water flea	1.5E+00	4.4E+00
Chrysene	Blue-green Algae	1.5E+02	4.5E+02
Chrysene	Blue-green Algae	5.2E+01	1.6E+02
Pyrene	Fathead Minnow	1.5E-01	1.1E+00
Pyrene	Water flea	9.5E-01	7.0E+00
Pyrene	Mosquito	1.9E-01	1.4E+00
Pyrene	Blue-green Algae	1.3E+01	9.7E+01

TABLE 14

COMPARISON OF COMPOUND CONCENTRATIONS
IN THE UPPER AQUIFER WITH
NATIONAL AMBIENT WATER QUALITY CRITERIA (mg/l)*

	Concentration Mean	AWQC Freshwater Chronic	Concentration Max	AWQC Freshwater Acute
Metals - Total				
Antimony	0.0041	1.6	0.0213	9
Arsenic	0.0069	0.048 (v)	0.0283	0.36 (III)
Beryllium	0.0023	0.0053	0.0025 (a)	0.13
Cadmium	0.0003	0.0011	0.0008	0.0039
Chromium	0.01	0.011	0.0256	0.016
Cobalt	0.0098	NP	0.0133	NP
Copper	0.016	0.012	0.03	0.018
Lead	0.0043	0.0032	0.01	0.082
Manganese	0.51	NP	1.82	NP
Mercury	0.00013	0.000012	0.00042 J	0.0024
Nickel	0.021	0.16	0.05	1.4
Selenium	0.0011	0.035	0.0014 R	0.26
Silver	0.005	0.00012	0.01	0.0041
Thallium	0.0014	0.04	0.0028 R	1.4
Vanadium	0.011	NP	0.0225	NP
Zinc	0.08	0.11	0.12	0.12
Volatile Organics				
Chloroform	0.0006	1.24	0.0025 (a)	28.9
1,1-Dichloroethane	0.00066	NP	0.0025 (a)	NP
1,1-Dichloroethene	0.00064	NP	0.0025 (a)	11.6
t-1,2-Dichloroethene	0.0009	NP	0.003	11.6
c-1,2-Dichloroethene	0.0002	NP	0.0003	11.6
Methylene Chloride	0.0014	NP	0.005	NP
Tetrachoroethene	0.00098	0.84	0.0025 (a)	5.28
Trichloroethene	0.00074	21.9	0.0025 (a)	45
Semivolatile Organics				
Acenaphthene	0.0036	0.52	0.021	1.7
Benzo(a)Anthracene	0 0035	NP	0.018	NP
Benzo(b)Fluoranthene	0 0037	NP	0.010 (a)	NP
Benzo(g,h,i)Perylene	0 0031	NP	0.010 (a)	NP
Chrysene	0.0032	NP	0.010 (a)	NP
Fluoranthene	0 0033	NP	0.010 (a)	NP
Pyrene	0.0038	NP	0.028	NP
1,3-Dichlorobenzene	0.0089	0.763	0.11	1.12
di-n-Octylphthalate	0.005	NP	0.012 J	NP
bis(2-ethylhexyl) Phthalate	0.0047	NP	0.014 J	NP

* Metals assume a hardness of 100 mg CaC03
NP Not Promulgated
J Value flagged as estimated in RI.
R Value flagged as rejected in RI.
(a) Value is one-half the highest detection limit.
Shaded values indicate the value exceeds an ARAR.
From Table 5-32 Environmental Risk Assessment (AGI, 1990c).

for all exposure scenarios from exposure to metals and volatile and semivolatile organic compounds. In addition, sludge contaminants may pose a threat to wildlife and/or aquatic organisms.

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 public health, welfare, or the environment.

VII. DESCRIPTION OF ALTERNATIVES

This section presents a narrative summary of each alternative. Additionally, a description of the major applicable or relevant and appropriate requirements (ARARs) and other standards to be considered (TBCs) utilized for the specific components of the waste management process is provided. A detailed assessment of each alternative can be found in Chapter 4 of the FS.

Several alternatives were eliminated early in the screening process because it was readily apparent that they would not effectively address contamination, could not be implemented, or would have had excessive cost compared to an alternative that would achieve the same degree of protection or level of effectiveness. Table 15 lists each of the proposed alternatives and identifies the elements of each.

The remedial alternatives consider four treatment options for sludge/soil:

--excavation and offsite disposal

--excavation, offsite disposal and capping

--onsite solidification

--onsite and offsite incineration

Two alternatives were considered for treatment of contaminated groundwater:

--oil/water separation and dissolved air flotation (DAF)

--oil/water separation and carbon adsorption

All alternatives, except Alternative 1 (No Action) and Alternative 2 (Institutional Controls), have the following features in common:

--soil flushing

Table 15
Elements of Proposed Alternatives

Remedy Elements	Proposed Alternatives 1	2	3	4	5*	6	7	8	9	10	11	12
Groundwater (GW) Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Institutional Controls		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dust Control and Air Monitoring			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Backfilling of Pit with Clean Material			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alternative Drinking Water Supply		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GW Extraction & Soil Flushing			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GW Treatment by Oil/Water Separation & Dissolved Air Flotation (DAF)			✓		✓		✓		✓		✓	
GW Treatment by Oil/Water Separation & Carbon Adsorption				✓		✓		✓		✓		✓
Off-Site GW Discharge			✓		✓		✓		✓		✓	
On-Site GW Discharge				✓		✓		✓		✓		✓
Low Permeability Cap					✓	✓	✓	✓				
Soil Excavation Off-Site Disposal			✓	✓	✓	✓						
Soil Excavation Solidification							✓	✓				
On-Site Soil Incineration									✓	✓		
Off-Site Soil Incineration											✓	✓

** EPA/IDHW Preferred Alternative*

--air monitoring and dust control measures during construction

--alternate onsite drinking water supply, if necessary

--post-construction institutional controls maintained by UPRR and operation and maintenance (O & M)

Contaminants found in groundwater, although currently below both maximum contaminant levels (MCLs) and maximum contaminant limit goals (MCLGs), but above ambient water quality criteria (AWQC), will be closely tracked. Monitoring of the groundwater and the pump/treat system during groundwater remediation activities will be conducted to ensure that groundwater remediation goals are achieved. If cleanup goals are not met, modifications to the groundwater treatment system will be necessary.

Additional soil and groundwater sampling will also be conducted prior to commencement of remedial activities in order to determine background concentrations. Preliminary target concentrations/remediation goals for contaminants of concern have been established for the site and are provided in the Record of Decision. Final remediation goals, target concentrations and performance standards will be identified following the determination of soil and groundwater background concentrations.

A. ARARs and TBCs:

CERCLA Section 105 required the NCP to include "methods and criteria for determining the appropriate extent of removal, remedy, and other measures authorized by the Act..." In response, EPA developed the applicable or relevant and appropriate (ARARs) concept. The 1985 NCP revisions and Compliance Policy (50 FR 47946) required that remedial actions "attain or exceed applicable or relevant and appropriate Federal public health and environmental requirements." Since that time, SARA codified and expanded the ARARs concept, OSWER provided Interim Guidance on ARARs published on August 27, 1987 (52 FR 32496) and EPA published the "CERCLA Compliance with Other Laws Manual" which provides additional guidance on the Agency's interpretation of the SARA provisions and their implementation.

The principal federal and state regulations which were considered in evaluating the groundwater component of the remedial alternatives are:

- Federal Water Pollution Control Act (Clean Water Act) (CWA)(33 USC 1251)

- Safe Drinking Water Act (SDWA)(40 USC 300)

- Underground Injection Control (40 CFR Part 144)

- Idaho Solid Waste Management Regulations and Standards Manual (Section 16.01.6005,01, 16.01.6008,07)

- Idaho State Well Construction Standards (Idaho Code Title 42-238(4))

- Idaho Construction and Use of Injection Wells (Idaho Code Title 42, Chapter 39- Rule 8,1,1, Rule 8,2,1,a., Rule 8,3,1)

- Idaho Water Quality Standards and Wastewater Treatment Requirements (Section 16.01.2200, 16.01.2250,06, 16.01.2302, 16.01.2460, 16.01.2600)

- Idaho Regulations for Public Drinking Water Systems.

For Offsite Only:

- City of Pocatello Municipal Code- Non-Residential Wastewater Discharges (Sections 13.20.030 N.3, 13.20.040 D.1)

Other non-promulgated, non-enforceable guidelines or criteria EPA considered in selecting a preferable alternative were TBCs, or "To Be Considered". TBCs included OSWER Interim Final Directive 9283.1-2 "Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites" dated December 1988; the proposed maximum contaminant levels (PMCLs) and proposed maximum contaminant level goals (PMCLGs) for contaminated groundwater; ambient water quality criteria (AWQC) which were developed for the protection of human health and aquatic life; and, drinking water health advisories which provide health-based guidance levels for contaminants in drinking water.

<u>Groundwater</u>

CERCLA section 121(d)(2)(A) requires onsite CERCLA remedies to attain standards or levels of control established under the Safe Drinking Water Act (i.e. MCLs or MCLGs). According to the NCP (55 <u>FR</u> 8848), where MCLGs are set at zero, the remedial actions shall attain MCLs for ground or surface water that are current or potential sources of drinking water. Either MCLs, non-zero MCLGs, risk-based levels or lowest quantitation limits will be the groundwater remediation goals for the UPRR sludge pit. Further discussion is provided later in the section entitled **Remediation Goals.**

Under the CWA, State Antidegradation Requirements/Use Classification require every state to classify all the waters within its boundaries according to intended use. There are two aquifers (Upper and Lower) beneath the sludge pit. EPA has designated the Upper Aquifer as Class IIB since it is potentially available for drinking water, agriculture or other beneficial uses. The Lower Aquifer is Class I (i.e. drinking water) as it is the primary drinking water source for the community.

The CWA section 301(b) requires that, at a minimum, all direct discharges meet technology-based limits for conventional pollutant control technology. Because there are no national effluent limitation regulations for releases from CERCLA sites, technology-based treatment requirements are determined on a case-by-case basis using best professional judgement. Oil/water separation, dissolved air flotation, carbon adsorption and soil flushing were the types of pollutant control technologies evaluated for the groundwater alternatives. All of these techniques are proven technologies for treatment of groundwater contaminated by NAPL and other compounds.

The various Idaho state standards listed above primarily address solid waste management, groundwater well construction, and protection of state groundwater against unreasonable contamination or deterioration. These standards are designed to control and regulate the public drinking water system in order to protect the health of consumers.

The City of Pocatello Municipal Code provides uniform regulations and requirements applicable to dischargers into the city wastewater collection and treatment system. UPRR's current wastewater discharge limit with the City of Pocatello will require an increase in volume in order to dispose of treated groundwater in excess of the currently permitted amount.

Sludge/Soil

The principal regulations which were considered in evaluating remedial alternatives for sludge and soil were:

- Occupational Safety and Health Act (OSHA) (29 USC, CFR 1910.12)

- Clean Air Act (CAA) (42 USC 7401, 7410, and 7411)

- Rules and Regulations for the Control of Air Pollution in Idaho (Citations: 16.01.1011. 16.01.1201, 16.01.1501-16.01.1550, 16.01.1957)

- Idaho Solid Waste Management Regulations and Standards Manual (Sections 16.01.6004,01, 16.01.6005,01, and 16.01.6008,16).

TBCs for sludge/soil included OSWER Directive #9355.4-02 entitled "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund sites", dated September 7, 1989, Memorandum re:

"Cleanup Level for Lead in Groundwater" from H. Longest, OERR and B. Diamond, OWPE to P. Tobin, Region IV Waste Management Division, and American Conference of Governmental Industrial Hygienists Threshold Limit Values.

OSHA requirements (1910.12) pertain to workers engaged in response or other hazardous waste operations. Excavation of the sludge pit, installation of a soil flushing treatment system, backfilling and grading of the pit are considered hazardous waste operations at this site.

CAA requirements pertain to national ambient air quality standards (NAAQS), and state implementation plans for compliance with the NAAQS. Rules and Regulations for the Control of Air Pollution in Idaho pertain to state air quality standards, process emissions, visible emission standards and fugitive dust standards. The State of Idaho ambient air quality standards are based on total suspended particulates (TSP). Pocatello is a federal, nonattainment area for particulate matter (PM_{10}). Onsite dust control measures must be implemented to prevent activities at the sludge pit from causing or contributing to a violation of the NAAQS or the state TSP standards.

A detailed assessment of the extent to which various remedial alternatives meet ARARs and TBCs can be found in the **Threshold Criteria** and **Statutory Determinations** sections of the ROD.

B. Description of Alternatives:

The following twelve remedial groundwater and sludge/soil remedial alternatives were evaluated.

Alternative 1: No Action (Groundwater Monitoring).

Estimated Time for Construction:	**-0-**
Estimated Time for Operation:	**30 years (monitoring)**
Estimated Capital Cost:	**-0-**
Estimated O & M:	**$635,300**
Estimated Total (Present Worth):	**$635,300**

The No-Action Alternative is required by law to be developed and acts as a baseline for comparison with the cleanup alternatives. Under this alternative, no action would be taken to clean up contaminated sludge, silt, soils or groundwater, consequently this alternative is not protective of human health or the environment and does not meet ARARs. However, a long-term groundwater monitoring program would be implemented to monitor movement of the contaminant plume. Since this alternative does not change contaminant concentration or exposure, the risk remaining at the site after remedial activities have been completed (residual risk) is equivalent to the current, estimated site risks based on the risk assessment results (baseline risk).

Alternative 2: Institutional Controls/Groundwater Monitoring.

Estimated Time for Construction:	**2-6 months**
Estimated Time for Operation:	**30 years (monitoring)**
Estimated Capital Cost:	**$33,150**
Estimated O & M:	**$636,700**
Estimated Total (Present Worth):	**$669,850**

This alternative involves surrounding the sludge pit with a six-foot chain link fence. Land and water use restrictions would be added to the property deed to prohibit current and future landowners from disturbing the site and from using the site groundwater resources. If necessary, an alternate drinking water supply system would be provided to serve potential future businesses and/or residents moving onto the site property. This alternative does not reduce contaminant concentrations and only nominally reduces exposure, therefore, residual risk is equivalent to baseline risk. In addition, this alternative does not meet ARARs.

Alternative 3: Excavation & Offsite Disposal/Groundwater Treatment (with Oil/Water Separation and Dissolved Air Flotation (DAF))/Soil Flushing/Offsite Discharge/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**4-6 months**
Estimated Time for Operation:	**5 years (treatment)** **30 years (monitoring)**
Estimated Capital Cost:	**(up to) $4,894,208**
Estimated O & M:	**$1,624,300**
Estimated Total Cost (Present Worth):	**(up to) $6,518,508**

This alternative is designed to reduce potential human and environmental exposure to contaminants contained in the sludge. By removing the sludge, the source of contamination to groundwater beneath the pit will be significantly reduced. In addition, this alternative is designed to prevent offsite migration of groundwater from the Upper Aquifer contaminated with NAPL, prevent migration of NAPL and other contaminants from the Upper to the Lower Aquifer, and to treat NAPL and other contaminants in the Upper Aquifer which exceed PMCLs and PMCLGs.

The alternative consists of excavating sludge and soil, and transporting it to a RCRA approved landfill. Testing of contaminated sludge and soil will occur prior to disposal in the landfill to demonstrate compliance with land disposal restriction (LDR) treatment standards. If the contaminated sludge and soil fail the RCRA tests, they will be treated, as appropriate, prior to disposal. The pit and other excavated areas will be backfilled with clean fill. Because the vertical and horizontal extent of this contamination is presently unknown, sampling of the underlying and surrounding soil would be performed periodically during excavation, with the results determining whether to excavate further in order to meet cleanup goals (site-specific remediation levels that define the extent of cleanup required by federal, state and local law).

Excavation of the Michaud Gravel will likely be limited since the formation is extremely coarse in nature. The Michaud Gravel consists of a poorly sorted mixture of gravel, cobbles, and boulders ranging up to 9 feet in diameter, ranging from dense to very dense. Current estimates indicate that approximately 4,200 cubic yards of sludge and soil could be removed from the pit and surrounding areas. However, the maximum extent of excavation could extend down to the existing level of the water table (i.e. the top of the Upper Aquifer).

Although it is intended that all contaminated sludge and soil which exceed cleanup goals will be excavated, this may not be feasible due to subsurface conditions as mentioned above. Therefore, soil flushing, using uncontaminated water from Batiste Springs, would be used to flush contaminants beneath the excavated area to the groundwater surface via infiltration galleries. By using a system of perforated drains, the water would infiltrate into and through the unsaturated soil down to the Upper Aquifer where it would be captured with groundwater extraction wells and pumped to the surface for treatment.

Since the technical feasibility of excavating through soils (as described above) is uncertain, it is assumed that 4,200 cubic yards will be the limit of removal. Therefore, additional protection is necessary. Unlike Alternatives 5 and 6, this alternative (and Alternative 4), does not include the placement of a low permeability cap over the backfilled pit. Without the low permeability cap, risks associated with the volatilization of wastes, direct contact, and infiltration of water that could leach contaminants into underlying soil, potentially recontaminating treated groundwater may not be adequately addressed.

Treatment of groundwater and nonaqueous phase liquids (NAPL) would involve using an oil/water separator to skim off floating oil. The wastewater would then be run through an onsite dissolved air flotation unit (DAF) for removal of primarily emulsified oil, semivolatile organic compounds, and metals in the NAPL before discharge to the Pocatello publicly owned treatment works (POTW). Organic contaminants remaining in the wastewater will receive biological treatment at the POTW. Skimmed oil will be kept in an onsite holding tank for sale to a recycler; residual sludge will be disposed in an approved, offsite landfill.

Air monitoring and dust control measures will be implemented during site cleanup activities to reduce emissions and to ensure the protection of site workers, nearby workers and residents. The dust control measures may include spraying the ground surface with clean water or an approved chemical dust suppressant. Long-term groundwater monitoring and deed restrictions would be required. If monitoring indicates that groundwater contamination has not been adequately remediated, an alternate drinking water supply system would be provided to serve potential future businesses and/or residents moving onto the site property.

Alternative 4: Excavation & Offsite Disposal/Groundwater Treatment (with Oil/Water Separation and Carbon Adsorption)/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**4-6 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $5,689,163**
Estimated O & M:	**$4,130,400**
Estimated Total (Present Worth):	**(up to) $9,819,563**

Treatment of the sludge and soil contamination in Alternative 4 is identical to the treatment discussed in Alternative 3. The groundwater treatment and disposal method in Alternative 4, however, would involve carbon adsorption and onsite discharge, rather than dissolved air flotation and offsite discharge. The carbon adsorption system would enhance groundwater cleanup by specifically removing organic contaminants.

The extracted groundwater would be pumped from the oil/water separator to the carbon adsorption unit for further treatment. The carbon adsorption system brings the contaminated groundwater into direct contact with activated carbon by passing the water through carbon containing vessels. The activated carbon selectively adsorbs hazardous organic particles. The treated water would then be routed to the infiltration galleries for use in the soil washing process. Used carbon would be recycled offsite through combustion at an approved regeneration facility.

Institutional controls, air monitoring, dust control, groundwater monitoring and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 5: Excavation & Offsite Disposal/Low Permeability Cap/Groundwater Treatment (with Oil/Water Separation and DAF)/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10 months**
Estimated Time for Operation:	**5 years predicted (treatment)** **30 years (monitoring)**
Estimated Capital Costs:	**(up to) $2,139,650**
Estimated O & M:	**$1,657,900**
Estimated Total (Present Worth):	**(up to) $3,797,550**

This alternative is designed to reduce the primary source of contamination at the site by excavating contaminated sludge and soil to a depth that is technically practical, disposing at an approved offsite landfill, backfilling the excavated area with clean fill and covering it with a low permeability cap.

Excavation of soils beneath the sludge may be difficult due to the subsurface conditions. These soils consist of a poorly sorted mixture of gravel, cobbles, and boulders up to 9 feet in diameter, ranging from dense to very dense. Therefore, it is assumed that only visible sludge (i.e. material that is discolored or noted to have the consistency of sludge) and underlying silt, up to a maximum of 4,200 cubic yards, would be removed.

Since the technical feasibility of excavating through soils (as described above) is uncertain, it is assumed that 4,200 cubic yards will be the limit of removal. Therefore, additional protection is necessary. A low permeability cap will be placed over the backfilled pit to reduce volatilization of wastes, direct contact, and infiltration of water that could leach contaminants into underlying soil, potentially recontaminating treated groundwater. The cap will protect, not interfere with, the soil flushing component of the remedy by preventing the potential introduction of contaminants into the perforated drains via percolating rainwater, snowmelt, etc., from the ground surface. Soil flushing is intended to operate in a closed loop system. By using a system of perforated drains, the water would infiltrate into and through the remaining unsaturated, contaminated soil down to the Upper Aquifer where it would be captured with groundwater extraction wells and pumped to the surface for treatment.

Testing of contaminated sludge and soil will occur prior to disposal in the landfill to demonstrate compliance with land disposal restriction (LDR) treatment standards. If the contaminated sludge and soil fail the RCRA tests, they will be treated, as appropriate, prior to disposal.

Soil flushing and groundwater extraction and treatment using an onsite oil/water separator and DAF unit, infiltration galleries, institutional controls, dust control, air monitoring, groundwater monitoring, and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 6: Excavation & Offsite Disposal/Low Permeability Cap/Groundwater Treatment (with Oil/Water Separation and Carbon Adsorption)/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $2,820,750**
Estimated O & M:	**$4,164,000**
Estimated Total (Present Worth):	**(up to) $6,984,750**

Alternative 6 combines the contaminated sludge/soil excavation, offsite disposal and capping remedial activities described in Alternative 5 with the carbon adsorption groundwater treatment system described in Alternative 4. Institutional controls, dust control, air monitoring, groundwater monitoring and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 7: Sludge Solidification/Low Permeability Cap/Groundwater Treatment (with Oil/Water Separation and DAF)/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**12-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $6,410,850**
Estimated O & M:	**$1,643,500**
Estimated Total (Present Worth):	**(up to) $8,054,350**

This alternative is designed to treat the contaminated sludge and soil in, around and below the pit. Because the likelihood of success of this process is unknown, a bench scale treatability study would be performed to determine the suitability of this remedial alternative. If this alternative was found to be feasible, sludge and contaminated soils would be excavated to a depth that is technically practical (approximately 4,200 cubic yards) and mixed with stabilizing agents such as fly ash, lime, cement or proprietary chemicals to immobilize contaminants. An onsite landfill will be constructed for disposal of the solidified sludge and soil. To prevent possible future leaching of contaminants from the solidified mass to the groundwater, the landfill cell will be double lined and contain a leachate collection system. The entire landfill will be covered with a low permeability cap.

Soil flushing and groundwater extraction and treatment using an onsite oil/water separator and DAF unit, infiltration galleries, institutional controls, dust control, air monitoring, groundwater monitoring, and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 8: Sludge Solidification/Low Permeability Cap/Groundwater Treatment (with Oil/Water Separation and Carbon Adsorption)/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**12-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $7,195,950**
Estimated O & M:	**$4,149,600**
Estimated Total (Present Worth):	**(up to) $11,345,550**

This alternative combines the sludge solidification and its onsite disposal in a specially constructed landfill as described in Alternative 7 with the carbon adsorption groundwater treatment system described in Alternative 5.

Institutional controls, dust control, air monitoring, groundwater monitoring, and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 9: Onsite Incineration/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $23,240,950**
Estimated O & M:	**$1,624,300**
Estimated Total (Present Worth):	**(up to) $24,865,250**

This alternative is designed to treat contaminated sludge and soil in the pit which is the potential source of groundwater contamination. A test burn(s) to assess if incineration meets air quality standards will be required prior to implementation of this remedial alternative. Soil exceeding cleanup goals and sludge within the pit would be excavated and incinerated in an onsite incinerator. Ash would be transported and disposed in an approved landfill. Procedures for determining the extent of contamination of the underlying and surrounding soil and commensurate excavation, backfilling and grading are identical to those described in Alternative 3.

Soil flushing and groundwater extraction and treatment using the existing onsite oil/water separator and DAF unit, infiltration galleries, alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 10: Onsite Incineration/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $23,786,250**
Estimated O & M:	**$4,130,600**
Estimated Total (Present Worth):	**(up to) $27,916,850**

This alternative combines the carbon adsorption groundwater treatment system remedial action described in Alternative 4 and the onsite incineration of contaminated sludge and soil described in Alternative 9. The remaining remedial features of this alternative are also described in Alternative 3.

Alternative 11: Offsite Incineration/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $38,662,850**
Estimated O & M:	**$1,624,300**
Estimated Total (Present Worth):	**(up to) $40,287,150**

This alternative is designed to treat contaminated sludge and soil in the pit which is the potential source of groundwater contamination. Soil exceeding cleanup goals and sludge within the pit would be excavated and incinerated in an offsite incinerator. Ash would be disposed in an approved landfill. Procedures for determining the extent of contamination of the underlying and surrounding soil and commensurate excavation, backfilling and grading are identical to those described in Alternative 3.

Soil flushing and groundwater extraction and treatment using an onsite oil/water separator and DAF unit, infiltration galleries, institutional controls, dust control, air monitoring, groundwater monitoring, and an alternate drinking water supply system are also included in this alternative as described in Alternative 3.

Alternative 12: Offsite Incineration/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control/Groundwater Monitoring.

Estimated Time for Construction:	**10-14 months**
Estimated Time for Operation:	**5 years predicted (treatment)**
	30 years (monitoring)
Estimated Capital Costs:	**(up to) $39,208,150**
Estimated O & M:	**$4,130,600**
Estimated Total (Present Worth):	**(up to) $43,338,750**

This alternative combines the carbon adsorption groundwater treatment system remedial action described in Alternative 4 and the offsite incineration of contaminated sludge and soil described in Alternative 11. The remaining remedial features of this alternative are also described in Alternative 3.

VIII. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

For the purpose of remedy selection, the relative performance of each remedial alternative was evaluated in relation to three categories of criteria: (1) threshold criteria [a required level of performance]; (2) primary balancing criteria; and, (3) modifying criteria. The nine evaluation criteria and the results of the evaluation are discussed below. A summary of the relative performance of the alternatives based on these criteria is included in Table 16.

A. Threshold Criteria

The remedial alternatives were first evaluated in relation to the threshold criteria: overall protection of human health and the environment, and compliance with ARARs. The threshold criteria are statutory requirements and must be met by all alternatives that remain for final consideration as remedies for the site.

1. Overall Protection of Human Health and the Environment. This criteria addresses whether or not a remedial alternative provides adequate protection and describes how risks are eliminated, reduced, or controlled through treatment and engineering or institutional controls.

All of the alternatives except Alternative 1 (no action) and Alternative 2 (institutional controls) are protective of human health and the environment and meet preliminary cleanup goals. Preliminary target concentrations/remediation goals for contaminants of concern have been established for the site and are provided in the Record of Decision. These preliminary remediation goals are concentrations of contaminants for each exposure route that are believed to provide adequate protection of human health and the environment based upon available site

TABLE 16

SUMMARY OF REMEDIAL ALTERNATIVES DETAILED ANALYSIS

CRITERIA	1	2	3	4	5	6	7	8	9	10	11	12
Overall protection of human health and environment	Low	Low	Medium	Medium	High	High	High	High	High	High	High	High
Compliance with ARARs	Low	Low	High	High	High	High	High	High	Medium	Medium	Medium	Medium
Long-term effectiveness and permanence	Low	Low	Medium	Medium	Medium	Medium	High	High	High	High	High	High
Reduction of toxicity, mobility, or volume	Low	Low	Medium	Medium	Medium	Medium	High	High	High	High	High	High
Short-term effectiveness	n/a[1]	n/a[1]	High	High	High	High	Medium	Medium	Medium	Medium	Medium	Medium
Implementability	n/a[1]	n/a[1]	High	High	High	High	Low	Low	Medium	Medium	Medium	Medium
State acceptance	—	—	—	—	—	—	—	—	—	—	—	—
Community acceptance	—	—	—	—	—	—	—	—	—	—	—	—

[1] n/a = not applicable, assumes no remedial action

Cost comparisons for each of the alternatives can be found on pages 31-38 information. Before final remediation goals are established, further refinement may be necessary after consideration of, for example, exposure factors, uncertainty factors, technical factors including the determination of soil and groundwater background concentrations.

Alternatives 3 through 6 (sludge/soil removal and offsite disposal) primarily treat the contaminated Upper Aquifer groundwater by pumping it to the surface, removing NAPL and other contaminants before discharge to the Pocatello publicly owned treatment works (POTW). Sludge and soil will be excavated to practicable depths, removed and disposed offsite in an approved landfill, and the pit area backfilled, graded and capped. A soil flushing treatment system will be installed and used to remove contaminants in remaining soils.

Alternatives 7 and 8 (solidification) and Alternatives 9 through 12 (incineration) treat both the contaminated sludge and soil, and the contaminated Upper Aquifer groundwater. Alternatives 7 and 8 include solidifying sludge/soil and placing it in a lined landfill cell onsite. These alternatives provide protection similar to offsite disposal and capping of the sludge pit (Alternatives 5 and 6) by eliminating inhalation, ingestion, and dermal contact exposure routes. Alternatives 9 through 12 (incineration) like offsite disposal, remove the contamination source, therefore, eliminating exposure routes. Incineration can destroy organic contaminants, but the ash byproduct will likely contain increased concentrations of heavy metals. Metals may become more mobile in the ash, necessitating solidification or stabilization before being landfilled.

Excavation, removal and offsite disposal of the contaminated sludge and soil will significantly reduce the threat of exposure from ingestion, dermal contact and inhalation. A baseline risk for the combined industrial/residential scenario associated with these exposure pathways is estimated at 6×10^{-2} for carcinogenic risk with a HI=8 for chronic, noncarcinogenic risks. By excavating and removing the contaminated sludge/soil to target concentrations, the cancer risk will be reduced to 2×10^{-5} and the chronic HI will decrease to 0.8.

Soil flushing, extraction and treatment of the contaminated groundwater will eliminate the threat of exposure from ingestion or inhalation of contaminated groundwater. The highest baseline risk for the combined industrial/residential scenario associated with these exposure pathways is estimated at 2×10^{-2} (Upper Aquifer NAPL wells) for carcinogenic risk with a HI=9 (Upper Aquifer non-NAPL wells) for chronic, noncarcinogenic risks. By excavating and removing the contaminated sludge/soil and lowering groundwater concentrations to target concentrations, the cancer risk from groundwater exposure will be reduced to 9×10^{-6} (Upper

Aquifer NAPL wells) and the chronic HI will decrease to 0.7 (Upper Aquifer non-NAPL wells).

Both groundwater treatment systems are equally protective for this site. Under the dissolved air flotation (DAF) treatment scenario, biological and inorganic treatment at the Pocatello POTW is further expected to remove organic and metal contaminants that the DAF unit alone does not remove. If modifications to the groundwater treatment system are necessary following evaluation of the system's effectiveness, carbon adsorption could be used to enhance groundwater cleanup by specifically removing organic contaminants.

The combined effect of the groundwater extraction and soil flushing system will prevent the offsite migration of contaminated Upper Aquifer groundwater, prevent migration of NAPL and other contaminants from the Upper to the Lower Aquifer, and treat NAPL and other contaminants which exceed PMCLs and PMCLGs. It will also provide additional protection to aquatic species by reducing the potential for contaminant migration to the Portneuf River.

2. Compliance with ARARs. This criteria addresses whether or not a remedial alternative will meet all of the applicable or relevant and appropriate requirements or provide grounds for invoking a waiver.

Alternatives 3 through 12 comply with the applicable, or relevant and appropriate requirements (ARARs) for this site and are discussed further in section XI entitled **Statutory Determinations.**

Tests performed on the sludge and soil indicate it is not a Resource Conservation and Recovery Act (RCRA) waste. Therefore, land disposal restrictions do not apply nor do RCRA landfill closure requirements. However, under Alternatives 3 through 6, the contaminated sludge and soil will be tested again, prior to disposal, and stabilized at the landfill, if necessary.

Alternatives 3 through 12 will meet state and federal air quality standards for visible emissions and fugitive dust, as each alternative includes dust control measures.

Alternatives 3 through 12 include groundwater extraction, treatment, and discharge process options that will meet both federal and state water quality ARARs for groundwater, drinking water, and leaching. Alternatives 3, 5, 7, 9 and 11 will require an increase in volume to UPRR's current wastewater discharge limit with the City of Pocatello. All of these alternatives use offsite discharge of treated wastewater to the Pocatello publicly owned treatment works (POTW).

B. Primary Balancing Criteria

Once an alternative satisfies the threshold criteria, five primary balancing criteria are used to evaluate the technical and engineering aspects of the remedial alternatives.

3. Long-term Effectiveness and Permanence. This criteria refers to the ability of a remedial alternative to maintain reliable protection of human health and the environment once remediation goals have been achieved. The magnitude of residual risk is considered as well as the adequacy and reliability of controls.

Alternatives 3 through 12 effectively and permanently reduce the risks associated with the inhalation, dermal contact, and ingestion of contaminated sludge and soil at the site. The magnitude of the residual risk remaining from untreated contaminants (or the risks remaining at the conclusion of remedial activities) is expected to be below preliminary cleanup goals. Alternatives 3 through 12 should maintain reliable protection of human health and the environment once these goals are met.

Additionally, capping included in Alternatives 5 through 8 reduces the amount of water available for leaching contaminants into the subsurface after soil flushing has been completed. The potential for leaching is further reduced in Alternatives 5 and 6 because sludge and contaminated soil are excavated and disposed offsite in an approved RCRA landfill. Leaching potential is also reduced in Alternatives 7 and 8 because solidification is designed to resist leaching and the solidified sludge and soil is placed in a lined, capped, onsite landfill. With regard to adequacy and reliability, caps require frequent inspection and possibly frequent maintenance. O & M costs associated with cap maintenance have been calculated for a period of 30 years. The adequacy and reliability of solidification depend on the process used. Because of the oily consistency of the sludge, the ability to ensure successful implementation and maintenance of this remedy is highly uncertain.

The groundwater extraction and treatment systems and the alternate water supply included in Alternatives 3 through 12 address groundwater threats by remediating the Upper Aquifer and by providing a clean drinking water source, if necessary, for potential future onsite users. The groundwater treatment system will further reduce the potential for any contaminants to reach the Portneuf River.

4. Reduction of Toxicity, Mobility, or Volume. This criteria refers to the anticipated performance of treatment technologies which will be used in the various remedial alternatives, such as solidification and incineration, etc.

Alternatives 3 through 12 reduce toxicity, mobility or volume through treatment to the maximum extent practicable.

The capping alternatives (Alternatives 5 through 8) will help to reduce the contaminant mobility by limiting surface water infiltration and subsequent leaching. Similarly, the offsite disposal alternatives (Alternatives 3 through 6) restrict contaminant mobility (although no treatment of the contaminated sludge and soil occurs) by placing the wastes within an approved RCRA landfill. Contaminant toxicity or volume is not reduced in the offsite disposal alternatives.

Alternatives 7 through 8 (solidification) reduce mobility, and perhaps toxicity, by immobilizing the contaminated sludge and soil. However, the waste volume may increase substantially, depending on the process used.

Alternatives 9 through 12 (incineration) reduce contaminant volume, and may also reduce mobility and toxicity. Incineration is expected to reduce the volume of the wastes by approximately 50 percent, however, the toxicity and mobility of the heavy metals in the ash may require treatment as a hazardous waste, raising uncertainties associated with land disposal.

The groundwater treatment processes will reduce contaminant mobility. The oil/water separator and DAF unit will reduce oil concentrations to approximately 10 parts per million. The groundwater treatment methods also allow for capture and recycling of oils. In-situ soil washing provides treatment of contaminated soils in Alternatives 3 through 12 by flushing soil contaminants to the groundwater where they will be treated via the oil/water separator and the DAF unit.

5. Short-term Effectiveness. This criteria refers to the period of time needed to achieve protection, and any adverse impacts on human health and the environment, specifically site workers and community residents, that may be posed during the construction and implementation period until cleanup goals are achieved.

Alternatives 3 through 12 pose some short-term risk to the community and site workers associated with the disturbance of contaminated soils generated during remedial activities. However, dust control measures and air monitoring are expected to minimize these effects. Additionally, short-term compliance with air quality standards could be more difficult for the solidification and incineration alternatives (Alternatives 7 and 8, and 9 through 12, respectively) than other alternatives due to air process emissions associated with those treatment options.

Excavation, backfilling of excavated areas, and transport and disposal of contaminated sludge and soil is estimated to take ten (10) months. If excavation in Alternatives 3 and 4 continues beyond the estimated maximum of 4,200 cubic yards, then Alternatives 5 and 6 may be faster to implement than Alternatives 3 and 4, and the other alternatives, thus providing protection in a shorter timeframe. However, the remaining contaminated soil would be treated by in-situ soil washing requiring more time to reduce contaminant concentrations.

While the groundwater remediation is expected to last at least five (5) years, cleanup will begin immediately and the greatest improvements in groundwater quality should be made within the first two years.

6. Implementability. This criteria refers to the technical and administrative feasibility of a remedial alternative, including the availability of goods and services needed to implement the selected remedy.

All of the alternatives can be implemented with varying degrees of difficulty.

Alternatives 5 and 6 are easily implemented technically, since excavation of 4,200 cubic yards of contaminated sludge and soil, its transportation and disposal at the RCRA approved landfill, and capping of the excavated pit are routine operations.

Alternatives 3 and 4, and 9 through 12 assume contaminated sludge and soil will be excavated to cleanup goals. However, excavation of soils beneath the "visible" sludge may be technically impracticable, if not impossible, due to its extremely coarse nature (i.e. a dense mixture of gravel, cobbles, and boulders ranging up to 9 feet in diameter). Therefore, excavation will likely be limited to practicable depths, resulting in the removal of approximately 4,200 cubic yards of contaminated sludge and soil.

The solidification alternatives (7 and 8) currently present significant implementation uncertainties due to the unknown reliability and effectiveness of solidification at the UPRR site and the potential for an increase in volume associated with the solidification process. None of these uncertainties can be fully addressed until a small scale test simulating site conditions is conducted.

Air pollution problems could affect the technical implementability of Alternatives 9 through 12. Elevated contaminant levels of metals found in the sludge present significant uncertainty in the technology's ability to effectively control process emissions.

Alternatives 3, 5, 7, 9 and 11 will require an increase in volume to UPRR's current wastewater discharge limit with the City of Pocatello. All of these alternatives use offsite discharge of treated wastewater to the Pocatello POTW. Preliminary discussions with J. Ulrich, current Manager of the Pocatello POTW, indicate that revisions to existing discharge permits should be negotiable.

United States Pollution Control Inc. (USPCI), a RCRA-approved waste disposal facility in Wendover, Utah, can accept the contaminated soil and sludge excavated from the sludge pit, as well as the sludge produced by treating contaminated groundwater using the oil/water separator and dissolved air flotation unit.

7. <u>Cost.</u> This criteria refers to the cost of implementing a remedial alternative, including operation and maintenance costs. Total cleanup costs for Alternative 5 (the preferred alternative) are estimated at $3,797,550. This alternative ranks in the middle among the 12 alternatives considered. The range of estimated costs is $635,300 (Alternative 1) to $43,338,750 (Alternative 12). Alternative 5 is cost-effective because it has been determined to provide overall effectiveness proportional to its costs and duration for remediation of the contaminated sludge, soil and groundwater.

C. Modifying Criteria

Modifying criteria are used in the final evaluation of the remedial alternatives after the formal comment period, and may be used to modify the preferred alternative that was discussed in the proposed plan.

8. <u>State Acceptance.</u> This criteria refers to whether the state agrees with the preferred remedial alternative.

IDEQ concurs with the selection of the preferred remedial alternative. IDEQ has been involved with the development and review of the Remedial Investigation/Feasibility Study, the Proposed Plan, and the Record of Decision.

9. <u>Community Acceptance.</u> This criteria refers to the public support of a given remedial alternative.

No written comments were received during the public comment period. Pocatello residents present at the public meeting on June 18, 1991, did not express a preference for a particular alternative, nor was there any opposition to the EPA preferred alternative. Community response is presented in the Responsiveness Summary, which addresses comments received during the public meeting.

IX. THE SELECTED REMEDY

The selected remedy is Alternative 5- excavation and offsite disposal/low permeability cap/groundwater treatment (with oil/water separation and dissolved air flotation)/soil flushing/offsite discharge/alternate drinking water supply, if necessary/institutional controls/air monitoring and dust control/groundwater monitoring.

Alternative 5 is protective of human health and the environment, complies with state and federal laws, and is cost effective. It utilizes a readily available technology to address sludge and soil contamination and a proven treatment system to provide a permanent solution to the groundwater contamination. Promulgated state rules and regulations which are more stringent than federal requirements are included as ARARs.

Major Components of the Selected Remedy

The major components of the selected alternative are:

- excavation of "visible" sludge (i.e. material that is discolored or noted to have the consistency of sludge) and underlying silt and soil to the maximum extent practicable; treatment of remaining soils via in-situ soil flushing to remediation levels.

- testing of contaminated sludge and soil prior to disposal at a frequency specified in the receiving facility's waste analysis plan including TCLP Extraction to demonstrate compliance with land disposal restriction (LDR) treatment standards; treatment, if necessary prior to disposal. Test results indicate that the sludge and soil are not RCRA characteristic waste, and therefore, no problems are anticipated with disposal at the facility. However, if unforseen circumstances arise, a treatability variance for the wastes is requested should the wastes fail TCLP and the Paint Filter Test at the disposal facility.

- disposal at an approved RCRA offsite landfill; excavated areas are backfilled with clean fill and graded.

- placement and maintenance of a low permeability cap over the entire pit boundary following excavation, backfilling and grading. Areas outside the pit that are excavated will be backfilled with clean fill and graded.

- extraction and treatment of nonaqueous phase liquid (NAPL) contaminated groundwater via the onsite oil/water separator and a dissolved air flotation unit to remediation goals; wastewater discharged to the Pocatello publicly owned treatment works; residual sludge resulting from groundwater treatment tested and disposed in an approved, offsite landfill; clean water obtained from Batiste Springs for use in washing contaminated soils.

- providing advance funding for design and installation of an alternate drinking water supply system to serve potential future onsite businesses and/or residences, in the event that the system is determined to be needed. Since businesses and residences do not exist onsite, installation of a new water supply is not immediately required.

- construction of a six-foot-high chain link fence around the entire sludge pit to ensure site security and to restrict public access to the site.

- implementing administrative and institutional controls in the property deed such as air monitoring, groundwater monitoring, and land and water use restrictions that supplement engineering controls and minimize exposure to releases of hazardous substances during and following remedial activities.

- conducting quarterly sampling and analysis of groundwater from all onsite wells, at a minimum, for the first three years following completion of remedial activities. If deemed appropriate, the sampling rate will be reduced to a lesser frequency for the remaining 27 years. Monitoring of the groundwater and the pump/treat system during groundwater remediation activities will be conducted to ensure that groundwater remediation goals are achieved. If cleanup goals are not met, modifications to the groundwater treatment system will be necessary.

- implementing a comprehensive, onsite and offsite, soil and groundwater sampling effort, prior to initiation of remedial activities, to determine background levels in these media and the extent to which onsite concentrations exceed background levels. Preliminary target concentrations/remediation goals for contaminants of concern have been established for the site and are provided in the Record of Decision. Final remediation goals, target concentrations and performance standards for contaminants of concern will be established following the determination of soil and groundwater background concentrations.

To the extent required by law, EPA will review the site at least once every five years after the initiation of the remedial action. The five year review assures that the remedial action continues to protect human health and the environment and assesses the need for additional remediation of any hazardous substances, pollutants or contaminants remaining at the site.

Remediation Goals

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (Interim Final, EPA/540/G-89/004) regarding development of remedial alternatives was used to assist EPA in the development of remedial actions. By utilizing the results of the assessment, reviewing site ARARs, considering factors related to technical limitations such as detection/quantitation limits, uncertainties and other pertinent information, chemical-specific remediation goals are being developed to mitigate existing and future threats to human health and the environment.

Chemical-specific remediation goals have not been finalized for the Union Pacific Railroad Sludge Pit, primarily due to the current lack of data regarding background concentrations of contaminants in groundwater and soil. With the exception of lead (noted below), chemical-specific remediation goals for sludge/soil and for groundwater will be established according to the following procedures prior to implementation of the remedy:

(1) Identification of regional background concentrations and lowest practical quantitation limits (LQLs) for contaminants. Prior to establishing final remediation goals, regional background concentrations of chemicals of concern in soil/sludge and groundwater must be determined, and lowest quantitation limits (LQL) must be defined. If contaminants of concern are below background levels, these contaminants will be eliminated from further consideration and from calculation of site-related risk levels based on a risk management decision.

(2) Compliance with groundwater ARARs identified in the FS. ARARs will be used as the remediation goals with two exceptions:

(a) when the contaminant concentration is greater than the background concentration or LQL, and the background concentration or LQL is greater than the groundwater ARAR, then the background concentration or LQL will be used as the remediation goal, or

(b) when the contaminant concentration is greater than the background concentration or LQL, but less than the groundwater ARAR, then the groundwater ARAR will be used as the remediation goal unless the cumulative risk-based level exceeds the upper end of the acceptable risk range.

(3) Identification of risk-based target concentrations. For soil contaminants, and groundwater contaminants without ARARs, risk-based concentrations will be used as cleanup goals. If the lowest quantitation limit or background is above the risk-based level, the LQL or background will be the cleanup level.

Once the background concentrations have been obtained, each contaminant will be compared to its LQL and its calculated target cancer, noncancer (chronic and subchronic) concentration (risk level = 1 x 10^{-6}, Hazard Index < 1). The highest of the three values (background, LQL or target concentration) will then become the final cleanup level. Finally, risks which will be cleaned up to either the target concentration or the LQL, will be summed to verify that they are within the acceptable risk range (for carcinogens) and below a Hazard Index of 1 (for non-carcinogens).

Risk-based concentrations will be derived from risk estimates of potential future uses (residential and industrial) which are higher than current risks, and which are cumulative across all chemicals and exposure media and pathways.

In the Human Health Risk Assessment, site risks were calculated separately for the residential and industrial scenarios. In order to calculate risk-based cleanup goals, it was assumed in the Feasibility Study that a person would both live and work on the site. The procedure involved adding the risk for a given chemical in the residential scenario to that in the industrial scenario. The resulting risk was used as the starting point to back calculate a risk-based concentration. While such a combined exposure scenario could theoretically occur, adding risks from the residential and industrial scenarios introduces potentially significant double counting of exposure and risk in, for example, the soil ingestion and inhalation pathways. However, the uncertainties associated with future land use in the area is accounted for by selecting the combined risk scenario.

Tables 2-11 through 2-15 in the Feasibility Study (FS) present the risks for each respective chemical of concern in the sludge/soil through each exposure pathway assuming a combined industrial/residential scenario. Similarly, Tables 2-16 through 2-19 of the FS present risks from ingestion and inhalation exposures for each chemical of concern in groundwater. Target concentrations for each contaminant are also presented which represent either a 10^{-6} cancer risk or cumulative hazard index of 1 apportioned over all chemicals.

These risks have been revised, incorporating the results of the air pathway reassessment, to provide cumulative residual risk at preliminary remediation goals for the reasonable maximum exposed (RME) individual (combined onsite worker/onsite resident scenario) for all contaminants and all pathways. The results are presented in Table 17 (soil/sludge), Table 18 (Upper Aquifer non-NAPL wells), Table 19 (Upper Aquifer NAPL wells), and Table 20 (Lower Aquifer) along with revised target risk concentrations. In addition, ARARs presented in Table 5-21 of the Feasibility Study are summarized and presented in these tables for comparison.

Table 17: Preliminary Risk-Based Concentrations for Sludge/Soil

Chemical	Present Concen. (mg/kg)	Future risk (a) Cancer Cumulative Risk	Future risk (a) Chronic Cumulative HI	Future risk (a) Subchronic Cumulative HI	Cancer Target Conc. (mg/kg) (b)	Chronic Target Conc. (mg/kg) (c)	Subchronic Target Conc. (mg/kg) (d)	Lowest Target Conc. (mg/kg) (e)	Risk at target concentration Cancer Risk	Risk at target concentration Chronic HI	Risk at target concentration Subchronic HI
1,1,2,2-Tetrachloroethane	0.99	8.8E-06			1.1E-01			1.12E-01	1.00E-06	0.00E+00	0.00E+00
1,1-Dichloroethane	8.3	3.4E-05	1.1E-03	1.0E-03	2.4E-01	1.05E+00	4.92E+00	2.45E-01	1.00E-06	3.12E-05	3.04E-05
1,2 dichlorobenzene	38		2.2E-02	2.0E-07		4.81E+00	2.27E+01	4.81E+00	0.00E+00	2.78E-03	2.49E-08
1,4-Dichlorobenzene	10	1.1E-05	6.1E-09	1.4E-07	9.3E-01	1.26E+00	5.97E+00	9.31E-01	1.00E-06	5.70E-10	1.28E-08
2,6-Dinitrotoluene	51	1.5E-03			3.3E-02			3.32E-02	1.00E-06	0.00E+00	0.00E+00
Antimony	3.3		4.3E-01	1.5E-01		4.17E-01	1.97E+00	4.17E-01	0.00E+00	5.44E-02	1.92E-02
Arsenic	27.4	1.2E-03	1.4E+00	5.3E-01	2.3E-02	3.47E+00	1.64E+01	2.34E-02	1.00E-06	1.23E-03	4.53E-04
Benzo(a)Anthracene	23	1.2E-02			2.[illegible] 03			1.96E-03	1.00E-06	0.00E+00	0.00E+00
Benzo(a)Pyrene	17	8.6E-03			2.0E-03			1.98E-03	1.00E-06	0.00E+00	0.00E+00
Benzo(k)Fluoranthene	33	1.6E-02			2.0E-03			2.00E-03	1.00E-06	0.00E+00	0.00E+00
Benzyl Alcohol	67		1.2E-02			8.47E+00		8.47E+00	0.00E+00	1.45E-03	0.00E+00
Beryllium	1.2	1.5E-04	1.2E-02		8.1E-03	1.52E-01		8.06E-03	1.00E-06	8.06E-05	0.00E+00
Cadmium	40.2	2.7E-08	2.2E+00		1.5E+03	5.08E+00		5.08E+00	3.44E-09	2.73E-01	0.00E+00
Carbon Tetrachloride	0.013	1.0E-07			1.3E-01			1.25E-01	1.00E-06	0.00E+00	0.00E+00
Chlorobenzene	0.66		1.6E-04	1.5E-04		8.35E-02	3.91E-01	8.35E-02	0.00E+00	1.97E-05	1.92E-05
Chloroform	0.38	9.9E-08			3.8E+00			3.84E+00	1.00E-06	0.00E+00	0.00E+00
Chloromethane	2.5	2.4E-06			1.1E+00			1.05E+00	1.00E-06	0.00E+00	0.00E+00
Chromium	136	6.7E-07	1.5E+00	1.9E-01	2.0E+02	1.72E+01	8.12E+01	1.72E+01	8.52E-08	1.87E-01	2.44E-02
Chrysene	23	1.2E-02			2.0E-03			1.96E-03	1.00E-06	0.00E+00	0.00E+00
Ethylbenzene	100	8.0E-07	7.2E-02			1.26E+01		1.26E+01	1.02E-07	9.13E-03	0.00E+00
Indeno(1,2,3-cd)Pyrene	12	6.1E-03			2.0E-03			1.97E-03	1.00E-06	0.00E+00	0.00E+00
Manganese	261		6.7E-02	9.7E-03		3.30E+01	1.55E+02	3.30E+01	0.00E+00	8.53E-03	1.23E-03
Mercury	0.96		1.6E-01	2.0E-05		1.21E-01	5.69E-01	1.21E-01	0.00E+00	2.02E-02	2.47E-06
Methylene Chloride	86	3.3E-05	1.1E-01	1.6E-01	2.6E+00	1.09E+01	5.14E+01	2.58E+00	1.00E-06	3.36E-03	4.78E-03
Naphthalene	14		2.5E-01	2.9E-01		1.77E+00	8.36E+00	1.77E+00	0.00E+00	3.22E-02	3.66E-02
Nickel	35.8	7.9E-09	9.2E-02	3.0E-02	4.5E+03	4.53E+00	2.14E+01	4.53E+00	9.99E-10	1.16E-02	3.78E-03
n-Nitrosodiphenylamine	54	1.2E-05			4.6E+00			4.61E+00	1.00E-06	0.00E+00	0.00E+00
Silver	2.7		4.6E-02			3.41E-01		3.41E-01	0.00E+00	5.82E-03	0.00E+00

Tetrachloroethene	56	1.3E-04	4.2E-01	3.7E-02	4.4E-01	7.08E+00	3.35E+01	4.42E-01	1.00E-06	3.32E-03	2.92E-04
Toluene	7.4		7.3E-06	7.1E-05		9.36E-01	4.39E+00	9.36E-01	0.00E+00	9.27E-07	9.04E-06
Total Xylenes	370		2.7E-04	2.6E-03		4.68E+01	2.19E+02	4.68E+01	0.00E+00	3.38E-05	3.27E-04
Trichloroethene	51.0	3.1E-05			1.6E+00			1.64E+00	1.00E-06	0.00E+00	0.00E+00
t-1,2 dichloroethene	107		3.9E-01	3.5E-02		1.35E+01	6.39E+01	1.35E+01	0.00E+00	4.93E-02	4.43E-03
Vanadium	45.8		3.4E-01	1.1E-01		5.79E+00	2.74E+01	5.79E+00	0.00E+00	4.30E-02	1.38E-02
Zinc	1530		4.0E-01	1.4E-01		1.93E+02	9.14E+02	1.93E+02	0.00E+00	5.07E-02	1.75E-02
TOTALS:		5.77E-02	7.91E+00	1.69E+00					1.82E-05	7.57E-01	1.27E-01

Notes:

HI - Hazard Index

(a) - based on combined residential and industrial risks and reanalysis of air pathway risks for the reasonable maximum exposure case.

(b) - concentration at which the cancer risk is 1 x 10E-06

(c) - concentration derived by apportioning a hazard index of 1 over all chemicals

(d) - concentration derived apportioning a hazard index of 1 over all chemicals

(e) - lowest risk based target concentration as calculated in (b), (c) and (d).

(f) - residual risk if site were cleaned up to the lowest target concentration.

Table 18: Preliminary Risk-Based Concentrations for Upper Aquifer NAPL Wells

		ARARs		Future Risk (a)							Risk at lowest target concentration		
Compound	RME Conc. (mg/l)	Drinking water (mg/l)	AWQC Chronic (mg/l)	Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI	Cancer Target Conc. (b)	Chronic Target Conc. (c)	Subchronic Target Conc. (d)	Lowest Target Conc. (e)	Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI
1,1-Dichloroethane													
1,1-Dichloroethene		0.007 MCL											
1,3-Dichlorobenzene	0.11		0.763	1.23E-04			8.92E-04			8.92E-04	1.00E-06		
Antimony	0.0085	0.003 PMCLG	1.6		1.27E+00	2.38E+00		2.14E-03	4.61E-03	2.14E-03		3.22E-01	6.00E-01
Arsenic	0.0059	0.050 MCL	0.048	4.15E-04	3.54E-01	6.60E-01	1.42E-05	4.13E-04	8.88E-04	1.42E-05	1.00E-06	8.53E-04	1.59E-03
Benzene		0.005 MCL											
Benzo(a)Anthracene	0.018	0.0001 PMCL		9.65E-03			1.86E-06			1.86E-06	1.00E-06		
Benzo(b)Fluoranthene	0.01	0.0002 PMCL		5.35E-03			1.87E-06			1.87E-06	1.00E-06		
Beryllium	0.0025	0.001 PMCL	0.0053	5.04E-04	3.00E-02	5.60E-02	4.96E-06	1.48E-05	3.19E-05	4.96E-06	1.00E-06	5.95E-05	1.11E-04
bis(2-ethylhexyl)Phthalate	0.014	0.004 PMCL		9.19E-06	4.20E-02	7.83E-02	1.52E-03	1.16E-04	2.50E-04	1.16E-04	7.63E-08	3.49E-04	6.51E-04
Cadmium		0.005 MCL	0.0011										
Chlorobenzene		0.1 MCL											
Chloroform	0.0025	0.1 MCL	1.24	3.81E-05		2.08E-02	6.55E-05		1.19E-05	1.19E-05	1.81E-07		9.90E-05
Chromium	0.0256	0.1 MCL	0.011		3.07E-01	1.43E-01		1.56E-03	8.36E-04	8.36E-04		1.00E-02	4.68E-03
Chrysene	0.01	0.0002 PMCL		5.35E-03			1.87E-06			1.87E-06	1.00E-06		
Lead	0.0079	0.015 AL	0.0032										
Manganese	0.2	0.050 S			6.00E-02	4.48E-02		2.37E-03	2.04E-03	2.04E-03		6.12E-04	4.57E-04
Mercury	0.0001	0.002 MCL	0.000012		1.05E-02			2.07E-07		2.07E-07		2.17E-05	
Methylene Chloride	0.005	0.005 PMCL		1.21E-03			4.12E-06			4.12E-06	1.00E-06		
Nickel	0.03	0.1 PMCL	0.16		9.00E-02	1.68E-01		5.34E-04	1.15E-03	5.34E-04		1.60E-03	2.99E-03
Selenium	0.0014	0.05 MCL	0.035		2.80E-02	5.22E-02		7.75E-06	1.67E-05	7.75E-06		1.55E-04	2.89E-04
Silver	0.01	0.05 MCL	0.00012		2.00E-01			3.96E-04		3.96E-04		7.91E-03	
Tetrachloroethene	0.0025	0.005 MCL	0.84	7.48E-06			3.34E-04			3.34E-04	1.00E-06		
Thallium	0.0028	0.0005 PMCLG	0.04		2.40E+00	4.48E-01		1.33E-03	2.86E-04	2.86E-04		2.45E-01	4.57E-02
Toluene		1.0 MCL											
Total Xylenes		10.0 MCL											
Trichloroethene	0.0025	0.005 MCL	21.9	9.24E-06			2.71E-04			2.71E-04	1.00E-06		
t-1,2-Dichloroethene	0.003	0.1 MCL			5.50E-02	3.50E-02		3.26E-05	2.39E-05	2.39E-05		4.39E-04	2.79E-04
Vanadium	0.0132				1.13E-01	2.11E-01		2.95E-04	6.35E-04	2.95E-04		2.53E-03	4.72E-03
Zinc	0.12	5.0 S	0.11		3.61E-02	6.71E-02		8.58E-04	1.84E-03	8.58E-04		2.58E-04	4.80E-04
Other*					5.49E-02	2.36E-02						5.49E-02	2.36E-02

Total Risk	2.27E-02	5.1	4.4	9.26E-06	0.6	0.7

(a) - based on combined risks for residential and industrial exposures.
(b) - concentration representing a 1 x 10E-06 cancer risk.
(c) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(d) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(e) - lowest risk based target concentration calculated in (b), (c) and (d) above.
* - sum of hazard indices < 1.0E-02 or sum of cancer risks < 1.0E-08.
(Reference: Appendix G in FS)

AL - USEPA action level
AWQC - USEPA ambient water quality criteria
MCL - USEPA primary maximum contaminant level
PMCL - USEPA proposed maximum contaminant level
PMCLG - USEPA proposed maximum contaminant level goal
S - USEPA secondary maximum contaminant level

Table 19: Preliminary Risk-Based Concentrations for Upper Aquifer Non-NAPL Wells

Compound	RME Conc. (mg/l)	ARARs		Future Risk (a)			Cancer Target Conc. (b)	Chronic Target Conc. (c)	Subchronic Target Conc. (d)	Lowest Target Conc. (e)	Risk at lowest target concentration		
		Drinking water (mg/l)	AWQC Chronic (mg/l)	Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI					Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI
1,1-Dichloroethane	0.0025			1.07E-05			2.34E-04			2.34E-04	1.00E-06		
1,1-Dichloroethene	0.0025	0.007 MCL		6.99E-05		2.31E-02	3.58E-05		5.24E-06	5.24E-06	1.46E-07		4.85E-05
1,3-Dichlorobenzene			0.763										
Antimony	0.0213	0.003 PMCL	1.6		3.19E+00	5.96E+00		6.67E-03	3.57E-03	3.57E-03		5.36E-01	1.00E+00
Arsenic	0.0283	0.050 MCL	0.048	1.98E-03	1.70E+00	3.17E+00	1.43E-05	5.39E-03	8.13E-03	1.43E-05	1.00E-06	8.58E-04	1.60E-03
Benzene		0 005 MCL											
Benzo(a)Anthracene		0 0001 PMCL											
Benzo(b)Fluoranthene		0.0002 PMCL											
Beryllium	0.0025	0.001 PMCL	0.0053	5.04E-04	3.00E-02	5.60E-02	4.96E-06	8.40E-06	1.27E-05	4.96E-06	1.00E-06	5.95E-05	1.11E-04
bis(2-ethylhexyl)Phthalate	0.01	0.004 PMCL		6.53E-06	3.00E-02	5.60E-02	1.53E-03	3.36E-05	5.07E-05	3.36E-05	2.20E-08	1.01E-04	1.88E-04
Cadmium	0.0008	0.005 MCL	0.0011		9.60E-02			8.60E-06		8.60E-06		1.03E-03	
Chlorobenzene		0.1 MCL											
Chloroform		0.1 MCL	1.24										
Chromium	0.02	0.1 MCL	0.011		2.40E-01	1.12E-01		5.38E-04	2.03E-04	2.03E-04		2.43E-03	1.13E-03
Chrysene	0.01	0.0002 PMCL		5.35E-03			1.87E-06			1.87E-06	1.00E-06		
Lead	0.01	0.015 AL	0.0032										
Manganese	1.82	0.050 S			5.46E-01	4.07E-01		1.11E-01	6.72E-02	6.72E-02		2.01E-02	1.50E-02
Mercury	0.0004	0.002 MCL	0.000012		8.40E-02			3.95E-06		3.95E-06		7.90E-04	
Methylene Chloride		0.005 PMCL											
Nickel	0.05	0.1 PMCL	0.16		1.50E-01	2.80E-01		8.40E-04	1.27E-03	8.40E-04		2.52E-03	4.70E-03
Selenium	0.0014	0.05 MCL	0.035		2.80E-02	5.22E-02		4.39E-06	6.62E-06	4.39E-06		8.78E-05	1.64E-04
Silver	0.005	0.05 MCL	0.00012		1.00E-01			5.60E-05		5.60E-05		1.12E-03	
Tetrachloroethene	0.0025	0.005 MCL	0.84	7.44E-06			3.36E-04			3.36E-04	1.00E-06		
Thallium	0.0028	0.0005 PMCL	0.04		2.40E+00	4.48E-01		7.53E-04	1.14E-04	1.14E-04		9.73E-02	1.82E-02
Toluene		1.0 MCL											
Total Xylenes		10.0 MCL											
Trichloroethene	0.0025	0.005 MCL	21.9	9.28E-06			2.69E-04			2.69E-04	1.00E-06		
t-1,2-Dichloroethene	0.0025	0.1 MCL			5.50E-02	3.50E-02		1.54E-05	7.93E-06	7.93E-06		1.74E-04	1.11E-04
Vanadium	0.0225				1.93E-01	3.60E-01			7.33E-04	7.33E-04		6.28E-03	1.17E-02
Zinc	0.12	5.0 S	0.11		3.61E-02	6.71E-02		4.86E-04	7.30E-04	4.86E-04		1.46E-04	2.72E-04
Other*					4.38E-02	1.35E-02						4.38E-02	1.35E-02

Total Risk	7.94E-03	8.9	11.0		6.17E-06	0.7	1.1

(a) - based on combined risks for residential and industrial exposures.
(b) - concentration representing a 1 x 10E-06 cancer risk.
(c) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(d) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(e) - lowest risk based target concentration calculated in (b), (c) and (d) above.
* - sum of hazard indices less than 1.0E-02 or sum of cancer risks less than 1.0E-08.

AL - USEPA action level
AWQC - USEPA ambient water quality criteria
MCL - USEPA primary maximum contaminant level
PMCL - USEPA proposed maximum contaminant level
PMCLG - USEPA proposed maximum contaminant level goal
S - USEPA secondary maximum contaminant level

Table 20: Preliminary Risk-Based Concentrations for Lower Aquifer Wells

		ARARs		Future Risk (a)							Risk at lowest target concentration		
Compound	RME Conc. (mg/l)	Drinking water (mg/l)	AWQC Chronic (mg/l)	Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI	Cancer Target Conc. (b)	Chronic Target Conc. (c)	Subchronic Target Conc. (d)	Lowest Target Conc. (e)	Cumulative Cancer Risk	Cumulative Chronic HI	Cumulative Subchronic HI
1,1-Dichloroethane													
1,1-Dichloroethene		0.007 MCL											
1,3-Dichlorobenzene			0.763										
Antimony		0.003 PMCLG	1.6										
Arsenic	0.002	0.050 MCL	0.048	1.42E-04	1.20E-01	2.24E-01	1.41E-05	6.73E-05	2.88E-04	1.41E-05	1.00E-06	8.44E-04	1.58E-03
Benzene	0.0042	0.005 MCL		2.81E-05	4.37E-01		1.49E-04	5.15E-04		1.49E-04	1.00E-06	1.55E-02	
Benzo(a)Anthracene		0.0001 PMCL											
Benzo(b)Fluoranthene		0.0002 PMCL											
Beryllium	0.0025	0.001 PMCL	0.0053	5.00E-04	2.97E-02	5.57E-02	5.00E-06	2.09E-05	8.95E-05	5.00E-06	1.00E-06	5.94E-05	1.11E-04
bis(2-ethylhexyl)Phthalate	0.012	0.004 PMCL		7.88E-06	1.89E-02	6.70E-02	1.52E-03	6.36E-05	5.17E-04	6.36E-05	4.17E-08	9.99E-05	3.55E-04
Cadmium	0.0006	0.005 MCL	0.0011		8.10E-02			1.37E-05		1.37E-05		1.84E-03	
Chlorobenzene	0.0025	0.1 MCL			1.20E-01	1.67E-02		8.42E-05	2.68E-05	2.68E-05		1.29E-03	1.79E-04
Chloroform		0.1 MCL	1.24										
Chromium	0.0145	0.1 MCL	0.011		1.80E-01	8.14E-02		7.34E-04	7.60E-04	7.34E-04		9.11E-03	4.12E-03
Chrysene		0.0002 PMCL											
Lead	0.028	0.015 AL	0.0032										
Manganese	0.550	0.050 S			1.65E-01	1.24E-01		2.56E-02	4.38E-02	2.56E-02		7.69E-03	5.75E-03
Mercury	0.0007	0.002 MCL	0.000012		1.40E-01			2.76E-05		2.76E-05		5.53E-03	
Methylene Chloride		0.005 PMCL											
Nickel	0.010	0.1 PMCL	0.16		2.97E-02	5.57E-02		8.35E-05	3.58E-04	8.35E-05		2.48E-04	4.65E-04
Selenium	0.0012	0.050 MCL	0.035		2.36E-02	4.43E-02		7.94E-06	3.42E-05	7.94E-06		1.56E-04	2.94E-04
Silver		0.050 MCL	0.00012										
Tetrachloroethene	0.0025	0.005 MCL	0.84	7.44E-06			3.36E-04			3.36E-04	1.00E-06		
Thallium	0.0023	0.0005 PMCLG	0.04		1.97E+00	3.68E-01		1.27E-03	5.44E-04	5.44E-04		4.67E-01	8.70E-02
Toluene	0.0025	1.0 MCL			5.00E-02			3.51E-05		3.51E-05		7.02E-04	
Total Xylenes	0.0076	10.0 MCL			2.11E-02	3.95E-02		4.51E-05	1.93E-04	4.51E-05		1.25E-04	2.34E-04
Trichloroethene	0.0025	0.005 MCL	21.9	9.28E-06			2.69E-04			2.69E-04	1.00E-06		
t-1,2-Dichloroethene		0.1 MCL											
Vanadium	0.012				1.03E-01	1.93E-01		3.51E-04	1.50E-03	3.51E-04		3.00E-03	5.60E-03
Zinc	0.15	5.0 S	0.11		4.45E-02	2.73E-01		1.88E-03	2.63E-02	1.88E-03		5.58E-04	3.42E-03
Other*					2.38E-02	1.28E-02						2.38E-02	1.28E-02

Total Risk	6.95E-04	[illegible].6	1.6	Totals	5.04E-06	5.14E-01	1.09E-01

(a) - based on combined risks for residential and industrial exposures.
(b) - concentration representing a 1 x 10E-06 cancer risk.
(c) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(d) - concentration derived by apportioning a hazard index of 1 over all chemicals.
(e) - lowest risk based target concentration calculated in (b), (c) and (d) above.
* - sum of hazard indices < 1.0E-02 or sum of cancer risks < 1.0E-08.

AL - USEPA action level
AWQC - USEPA ambient water quality criteria
MCL - USEPA primary maximum contaminant level
PMCL - USEPA proposed maximum contaminant level
PMCLG - USEPA proposed maximum contaminant level goal
S - USEPA secondary maximum contaminant level

To derive media-specific, risk-based concentrations for carcinogens, a 10^{-6} cancer risk level will be the target for each media. As discussed earlier, risk-based concentrations will be based on cumulative risks from all exposure pathways except the dermal route. Dermal exposure and risk estimation is not well understood at this time, and guidance is just now being developed to more formally evaluate the pathway. In particular, factors to estimate how much of a chemical is absorbed by the skin from a soil media are only available for PAHs, PCBs, DDT, and dioxin (2,3,7,8 TCDD). Of these, only PAHs are found at the UPRR facility.

A more refined dermal exposure estimate could be prepared for PAHs based on a recently developed estimate of PAH permeability from soil, i.e. 30%. A default value of 80% was used in the risk assessment. However, estimating cancer and noncancer risk will remain problematic. A dermal cancer potency factor has not been developed for PAHs (or other compounds) so the oral slope factor for benzo(a)pyrene (BaP) is commonly used to estimate oral and dermal cancer risk. BaP is known to cause tumors at the site of application (e.g. skin tumors in skin painting studies, etc.). The oral potency for BaP is based on an ingestion route of exposure. The rate of tumor formation and relative potency may be substantially different for dermal exposures, since there could be significant metabolic and other differences in exposed tissue types. For this reason, it has been determined to be inappropriate to estimate dermal cancer risks from PAHs based on the existing oral slope factor. If BaP acted solely in a systemic fashion (i.e. tumors occurred only at sites remote from the point of application, estimating dermal risks from an oral slope factor would be more appropriate).

Estimating systemic noncancer risks from dermal exposure to PAHs would be appropriate if reference doses (dermal or oral) were available. Several reference doses have been established for PAHs, but of the PAHs found at UPRR, a reference dose is only available for naphthalene. The naphthalene combined chronic and subchronic risk for all sludge/soil exposure pathways is 0.3, which includes a conservative estimate of dermal risks (80% absorption). Based on this low hazard index, it does not appear that a remediation goal will need to be established for naphthalene. This may change during remedial design, when chemicals are grouped by similar toxic endpoint. If cumulative risks are significant, remediation goals will be established.

In summary, risk-based concentrations will not be based on dermal pathway risks for the reasons outlined above, with the possible exception of naphthalene.

To derive media-specific concentrations of noncarcinogens, chemicals will first be grouped by similar toxic effects. Generally, the target risk level for each group will be a hazard index of 1, which will include exposures from all media. Media-specific concentrations for each chemical will be determined by apportioning the target hazard index over all media, such that the combination of groundwater and sludge/soil exposures will equal the target hazard index.

Deviation from a hazard index of 1 may be appropriate in some circumstances. For example, when large uncertainty and modifying factors are used to establish a reference dose (e.g. 1,000-10,000), a hazard index calculated based on it will be far less precise than one calculated using an uncertainty/modifying factor of 10. In the former case, there would be no distinguishable difference between a hazard index of 1 versus 3 from a toxicological standpoint, since such a large uncertainty/modifying factor was applied to the data. In such a circumstance, if factors of technical feasibility make it difficult to achieve a hazard index of 1, setting a target cleanup goal at a hazard index less than 1 may be appropriate based on a review of data and procedures used to establish the respective reference dose.

Lead. ARARs and potential cleanup goals for lead are discussed below. At the present time, neither a reference dose nor a cancer slope factor exist from which to estimate the risk from lead exposure. In their absence, an Uptake/Biokinetic Model has been developed by EPA to estimate blood lead concentrations in children (the sensitive population) from exposure to lead in food, water, soil, dust and air. However, EPA has not identified a blood lead level which is without adverse effects, nor has a policy been established for using blood lead data to derive soil or water cleanup levels.

<u>Lead in Soil.</u> Currently, EPA (OSWER Directive #9355.4-02) recommends an interim soil cleanup level of 500-1000 ppm for lead at CERCLA sites characterized as residential or potential residential. This directive is undergoing revisions to reflect use of the EPA Lead Uptake Biokinetic (UBK) Model as the best approach available for establishing soil cleanup levels. The model accounts for the contribution of various media to total exposure at a site and provides a strong scientific basis for choosing lead cleanup levels. An acceptable soil lead level of approximately 500 ppm is predicted for lead when the UBK model is run using: (1) the model's default parameters and (2) a benchmark of either a 95% probability of an individual having a blood lead level below 10 ug/dl or 95% of the sensitive population having blood lead levels below 10 ug/dl.

The UPRR property is currently industrial, but there are residences within 0.3 miles of the sludge pit. Given the potential for future residential use and close proximity to existing residential areas, 500 ppm will be used as a target cleanup level for all UPRR soils to ensure protection of public health.

Lead in Groundwater. During the course of the Remedial Investigation/Feasibility Study, the maximum contaminant level (MCL) for lead was 0.050 mg/l. In 1988, EPA proposed a new source water MCL of 0.005 mg/l. On June 7, 1991, EPA published a revised lead "Action Level" of 0.015 mg/l which replaces the 0.050 mg/l MCL. This value is consistent with a June 21, 1990, Office of Emergency and Remedial Response memorandum to EPA Region 4 establishing a cleanup level of 15 ug/l for lead in groundwater usable as a drinking water source at Superfund sites. This level is intended to be protective of sensitive populations, e.g. children. The 0.015 mg/l "Action Level" is considered an ARAR, therefore it will be used as the groundwater remediation goal at the UPRR Sludge Pit in Pocatello, Idaho.

X. Statutory Determinations

The procedures and standards for responding to releases of hazardous substances, pollutants and contaminants at the site shall be in accordance with CERCLA, as amended by SARA, and to the maximum extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 (1990), promulgated in the Federal Register on March 8, 1990.

EPA's primary responsibility at Superfund sites is to undertake remedial actions that are protective of human health and the environment. In addition, Section 121 of CERCLA establishes several other statutory requirements and preferences, including: a requirement that EPA's remedial action, when complete, must comply with applicable or relevant and appropriate environmental standards established under federal and state laws unless a statutory waiver is invoked; a requirement that EPA select a remedial action that is cost-effective and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and a statutory preference for remedies that permanently and significantly reduce the volume, toxicity or mobility of hazardous substances over remedies that do not achieve such results through treatment. Remedial alternatives at the site were developed to be consistent with these Congressional mandates.

The selected remedy meets statutory requirements of Section 121 of CERCLA, as amended by SARA, and to the extent practicable, the

National Contingency Plan. The evaluation criteria are discussed below.

A. Protection of Human Health and the Environment

The selected remedy protects human health and the environment through excavation, removal, capping and offsite disposal of contaminated sludge and soil, and through extraction, soil flushing and treatment of contaminated groundwater. NAPL contaminants will be permanently removed from the groundwater by oil/water separation and dissolved air flotation.

Excavation, removal and offsite disposal of the contaminated sludge and soil will significantly reduce the threat of exposure from ingestion, dermal contact and inhalation. A baseline risk for the combined industrial/residential scenario associated with these exposure pathways is estimated at 6×10^{-2} for carcinogenic risk with a HI=8 for chronic, noncarcinogenic risks. By excavating and removing the contaminated sludge and soil to preliminary target concentrations, the cancer risk will be reduced to 2×10^{-5} and the chronic HI will decrease to 0.8.

Soil flushing, extraction and treatment of the contaminated groundwater will eliminate the threat of exposure from ingestion or inhalation of contaminated groundwater. The highest baseline risk for the combined industrial/residential scenario associated with these exposure pathways is estimated at 2×10^{-2} (Upper Aquifer NAPL wells) for carcinogenic risk with a HI=9 (Upper Aquifer non-NAPL wells) for chronic, noncarcinogenic risks. By excavating and removing the contaminated sludge and soil and lowering groundwater concentrations to preliminary target levels, the cancer risk from groundwater exposure will be reduced to 9×10^{-6} (Upper Aquifer NAPL wells) and the chronic HI will decrease to 0.7 (Upper Aquifer non-NAPL wells).

The residual risk after cleanup may differ from estimates presented above if:

--ARARs (e.g. MCLs) are used rather than risk-based targets,

--another target cancer risk is used (e.g. 10^{-5} or 10^{-4})

--another method of calculating target concentrations for noncarcinogens is used (e.g. group by critical endpoint; use hazard index greater than 1.0)

--chemicals were eliminated based upon results of the background analysis because measured contaminant concentrations were below background concentrations.

Regardless of the method(s) used to establish remediation levels, the residual risk following cleanup will be within the acceptable risk range established in the NCP.

Potential short-term risks could arise during cleanup from vehicle traffic dust emissions, volatilization of sludge/soil contaminants during excavation, worker contact via ingestion of contaminated material, and volatilization of contaminants from dissolved air flotation. Short-term risks are currently low and are not expected to increase significantly during remedial activities. Control strategies such as dust suppression, ongoing air monitoring, and worker protection (clothing, equipment, etc.) will be implemented to minimize short-term risks. As specific information regarding contaminant concentration and emissions are obtained during remedial design, short-term risks will be re-evaluated. Modifications to the remedy will be made, if necessary, to protect nearby workers and residents.

B. Attainment of Applicable or Relevant and Appropriate Requirements of Environmental Laws

The selected remedy of excavation, removal, capping and offsite disposal of contaminated sludge and soil, and soil flushing, extraction, and treatment and offsite discharge of treated groundwater will comply with all applicable or relevant and appropriate requirements (ARARs) of Federal, as well as more stringent, promulgated State environmental and public health laws.

1. Applicable or Relevant and Appropriate Requirements (ARARs)

The ARARs for the sludge/soil component of the alternatives are listed below:

Action-Specific

Occupational Safety and Health Act (OSHA) (29 U.S.C.) (CFR 1910.12)- OSHA requirements pertain to workers engaged in response or other hazardous waste operations. (**Applicable**)

Idaho Solid Waste Management Regulations and Standards Manual (Section 16.01.6004,01, 16.01.6005,01 and 16.01.6008,16)- requires that all solid wastes be managed during storage, collection, transfer, transport, processing, separation, incineration, composting, treatment, reuse, recycling, or disposal to prevent health hazards, public nuisances, or pollution of the environment. (**Relevant and Appropriate**)

Chemical-Specific

Clean Air Act (42 U.S.C. 7401, 7410 and 7411)- CAA requirements pertain to national ambient air quality standards (NAAQS) and state implementation plans for compliance with NAAQS. (**Applicable**)

Rules and Regulations for the Control of Air Pollution in Idaho (Citations: 16.01.1011, 16.01.1201, 16.01.1501-16.01.1550, 16.01.1957)- The State of Idaho air pollution regulations pertain to state air quality standards, process emissions, visible emission standards and fugitive dust standards. (**Applicable**)

The ARARs for the groundwater component of the remedial alternatives are as follows:

Action-Specific

Idaho Solid Waste Management Regulations and Standards Manual (Section 16.01.6005,01, 16.01.6008,07)- see above under sludge/soil principal regulations. (**Relevant and Appropriate**)

Idaho State Well Construction Standards (Idaho Code Title 42-238(4))- provide rules that apply to all water wells, monitoring wells, etc., which are more than 18 feet bgs. (**Applicable**)

Idaho Construction and Use of Injection Wells (Idaho Code Title 42, Chapter 39- Rule 8,1,1, Rule 8,2,1,a., Rule 8,3,1)- rules and regulations are designed to protect state groundwater against unreasonable contamination or deterioration in order to preserve the resource for beneficial uses. (**Applicable**)

Idaho Regulations for Public Drinking Water Systems have been established to control and regulate the design, construction, operation, maintenance, and quality control of the public drinking water system to protect the health of consumers. (**Applicable**)

Chemical-Specific

Clean Water Act (CWA) (33 U.S.C. 1251) (Sections 101, 301(b)(1), 301(e), 302)- establishes objectives to restore and maintain the chemical, physical, and biological integrity of the waters of the United States. (**Applicable**)

Safe Drinking Water Act (SDWA) (42 U.S.C. 300[f]) (40 CFR Sections 141.11-141.16, 141.50-141.51, 141.61, 143.3, 144)- establishes the development of national primary drinking water regulations. The regulations provide maximum contaminant level standards which drinking water quality cannot exceed. (**Relevant and Appropriate**)

Underground Injection Control, 40 CFR 144- Rules and regulations promulgated under RCRA and Part C of the Safe Drinking Water Act. (**Applicable**)

Idaho Water Quality Standards and Wastewater Treatment Requirements (Section 16.01.2200, 16.01.2250,06, 16.01.2302, 16.01.2460, 16.01.2600)- Both surface and groundwaters of the State of Idaho must not contain hazardous materials in concentrations found to be of public health significance. Deleterious materials must not impair designated or protected beneficial uses. (**Applicable**)

<u>Location-Specific</u> **(Offsite Only)**

City of Pocatello Municipal Code- Non-Residential Wastewater Discharges (Sections 13.20.030 N.3, 13.20.040 D.1)- This code provides uniform regulations and requirements for dischargers into the city wastewater collection and treatment system. (**Applicable**)

2. <u>Information To-Be-Considered</u>

The following TBCs will be used as guidelines when implementing the selected remedy:

--Proposed maximum contaminant levels (PMCLs) and proposed maximum contaminant level goals (PMCLGs) for contaminated groundwater.

--OSWER Directive #9355.4-02 entitled "Interim Guidance on Establishing Soil Lead Cleanup Levels at Superfund sites", dated September 7, 1989 sets forth an interim soil cleanup level for total lead at 500 to 1000 mg/kg.

--Memorandum re: "Cleanup Level for Lead in Groundwater: from H. Longest, OERR and B. Diamond, OWPE to P. Tobin, Region IV Waste Management Division recommends a final cleanup level for lead in groundwater usable for drinking water which will meet the CERCLA requirement of protectiveness of human health and the environment.

--American Conference of Governmental Industrial Hygienists Threshold Limit Value- Provides recommended short- and long-term worker exposure values for contaminants.

--Drinking Water Health Advisories- Health-based guidance levels for contaminants in drinking water.

C. Cost Effectiveness

The selected remedy is cost-effective because it has been determined to provide overall effectiveness proportional to its costs and duration for remediation of the contaminated sludge, soil and groundwater. Since the technical feasibility of excavating through soils is uncertain, it is assumed that 4,200 cubic yards will be the limit of removal and contaminants will remain in unexcavated soils. Therefore, additional protection is necessary. Although the 30-year present worth of $3,797,550 for the selected remedy is higher than Alternatives 3 and 4 (all excavated amounts of contaminated sludge and soil being equal, i.e. 4,200 cubic yards, in the three alternatives), the benefits of a low permeability cap over the sludge pit include: (1) added protection against contaminant leaching from infiltration of rain or snowmelt, potentially decreasing the exposure duration; and (2) reducing the lateral and vertical migration of contaminants possibly remaining after excavation of the contaminant plume both downgradient of the sludge pit and near areas of highest groundwater contamination.

D. Use of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The State of Idaho and EPA have determined that the selected groundwater remedy for the treatment of contamination at the site represents the maximum extent to which permanent solutions and treatment technologies can be used in a cost-effective manner for the UPRR Sludge Pit site. The risk from the groundwater contamination is permanently reduced through soil flushing and treatment to acceptable exposure levels without transferring the risk to another media (e.g. air). The selected groundwater remedy provides the best balance of tradeoffs in terms of long-term effectiveness and permanence; reduction in toxicity, mobility or volume achieved through treatment; short-term effectiveness; implementability; and, cost. In addition, state and community acceptance were considered in making this determination.

Alternative sludge/soil treatment technologies including incineration and solidification were considered, to the maximum extent practicable, but were determined to be technically unsuitable for implementation at this site. Because of the oily consistency of the sludge, the ability to ensure successful implementation and maintenance of the solidification alternative is highly uncertain. Elevated contaminant levels of metals found in the sludge present significant uncertainty in the incineration technology's ability to achieve target cleanup concentrations.

Therefore, the selected remedy employs excavation of contaminated sludge and soil to technically practicable depths. The excavated sludge and soil will be removed from the site and disposed in an approved, offsite landfill. The excavated pit area will be backfilled, graded and covered with an impermeable cap. An innovative treatment technology, in-situ soil flushing system, will be installed and used to remove contaminants in remaining soils. Existing analysis of railyard and wastewater treatment plant operations, applicable governmental regulations, and the results of sludge chemical analyses indicate the sludge is not a hazardous waste as defined by RCRA, pursuant to 40 CFR 261.4(b)(7); therefore, the RCRA LDRs do not apply.

E. Preference for Treatment as Principal Element

By treating the contaminated groundwater and soil via flushing in an onsite treatment facility, the selected groundwater remedy addresses future ingestion/inhalation of contaminated groundwater posed by the UPRR Sludge Pit site through the use of treatment technologies. Therefore, the statutory preference for remedies that employ treatment as a principal element is achieved when addressing groundwater contamination at this site.

XI. DOCUMENTATION OF SIGNIFICANT CHANGES

The Proposed Plan for the Union Pacific Railroad Sludge Pit site was released for public comment on June 3, 1991. The Proposed Plan identified Alternative 5, contaminated sludge and soil excavation/offsite disposal/capping/soil flushing/groundwater pump and treat via oil-water separation and dissolved air flotation/institutional, engineering and administrative controls, as the preferred alternative. No verbal or written comments were received during the public comment period. Therefore, EPA has determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, were necessary.

UNION PACIFIC RAILROAD RESPONSIVENESS SUMMARY

I. Overview

The purpose of this responsiveness summary is to summarize and respond to substantive comments received during the public comment period held by EPA from June 7, 1991, through July 8, 1991, regarding the Environmental Protection Agency's (EPA) proposed cleanup plan for the Union Pacific Railroad (UPRR) sludge pit located near Pocatello, Idaho. The proposed plan was based on information in the Remedial Investigation and Feasibility Study (RI/FS) report prepared for this site. The RI/FS and proposed plan are/were available for review at the Pocatello Public Library and at EPA's office in Seattle, Washington. As well, copies of the proposed plan were mailed to local citizens that were on a mailing list developed as part of the Community Relations Plan for the UPRR site.

On June 18, 1991, EPA held a public meeting at the Pocatello Quality Inn Convention Center to present the results of the RI/FS and to discuss EPA's proposed plan. EPA encouraged participants to submit verbal comments during the meeting and/or submit written comments.

II. Background on Community Involvement

In June of 1988, EPA released a community relations plan outlining a program to address community concerns and keep the public informed regarding the remedial site investigations at the UPRR site. EPA intermittently released fact sheets during the investigations to keep the community apprised.

The following is a list of activities conducted by EPA to support community relations efforts for the UPRR Superfund site:

* September 1983 - Site proposed for National Priorities List (NPL).
* September 1984 - Site listed on the NPL.
* June 1988 - Interview conducted with local officials and citizens to develop Community Relations Plan.
* June 1988 - Community Relations Plan was published.
* June 1988 - Information repositories established at the Southeastern Idaho Health District Office and at the Pocatello Public Library.
* August 1988 - EPA distributed a fact sheet providing information on the start of the field work for the Remedial Investigation.

* July 1989 - EPA distributed a fact sheet on findings of the RI and announced upcoming activities related to the cleanup of the site.

* January 1990 - EPA distributed a fact sheet to update the public on site work.

* June 1991 - Proposed Plan was published.

* June 7, 1991 to July 8, 1991 - Public comment period for Proposed Plan.

* June 18, 1991 - Public meeting on Proposed Plan. Meeting was announced in proposed plan and local newspaper.

III. Summary of Public Comments and Lead Agency Response

There were no comments submitted during the public comment period (June 7, 1991 - July 8, 1991). Additionally, no oral comments were given during the public meeting (June 18, 1991).

Please Sign in......

Public Meeting
Proposed Plan
Union Pacific Railroad Sludge Pit (UPRR)
June 18, 1991
Pocatello, Idaho

Name	Address	City/State	Zip	Mailing List?
Virginia [illegible]	Box 1101	Pocatello Ida	83204	yes
Vincent Lasko	P.O. Box 7225	Seattle/WA	98115	No
Carl Martinez	2813 Jerome	Poc	83201	yes
[illegible]	7 Dartmouth	Pocatello	83201	already on it
Tim Jackson	?	Pocatello Idaho State Journal		
Deena Fix	2615 N. Harrison	Poc Ida	83201	? yes
Rod [illegible]	Box 642 [illegible]	Fort Hall, [illegible]	[illegible]	[illegible]
Stan & Jim [illegible]	9112 W. Poc. Ck Road	Poc Id	83201	Yes
Gordon Brown	4441 E. Jackson Ck Rd Inkom	Inkom, Id.	83245	yes

Superfund Glossary

Aquifer: An underground rock formation composed of materials such as sand, soil, or gravel that can store and supply **ground water** to wells and springs. Most aquifers used in the United States are within a thousand feet of the earth's surface.

Cleanup: Actions taken to deal with a release or threatened release of hazardous substances that could affect public health and/or the environment. The term "cleanup" is often used broadly to describe various **response actions** or phases of **remedial responses** such as the **remedial investigation/feasibility study**.

Enforcement: EPA's efforts through level action if necessary to force **potentially responsible parties** to perform or pay for a **Superfund** site **cleanup**.

Feasibility Study (FS): See **Remedial Investigation/Feasibility Study**.

Ground Water: Water found beneath the earth's surface that fills pores between materials such as sand, soil, or gravel. In **aquifers**, ground water occurs in sufficient quantities that it can be used for drinking water, irrigation, and other purposes.

Hazard Ranking System (HRS): A scoring system used to evaluate potential relative risks to public health and the environment from releases or threatened releases of **hazardous substances**. EPA and states use the HRS to calculate a site score, from 0 to 100, based on the actual or potential release of **hazardous substances** from a site through air, surface water, or ground water to affect people. This score is the primary factor used to decide if a hazardous waste site should be placed on the National Priorities List.

Hazardous Substances: Any material that poses a threat to public health and/or the environment. Typical hazardous substances are materials that are toxic, corrosive, ignitable, explosive, or chemically reactive.

National Priorities List (NPL): EPA's list of the most serious controlled or abandoned hazardous waste sites identified for possible long-term **remedial response** using money from the **Trust Fund**. The list is based primarily on the score a site receives on the **Hazard Ranking System** (HRS). EPA is required to update the NPL at least once a year.

Operation and Maintenance (O&M): Activities conducted at a site after a **response action** occurs, to ensure that the **cleanup** or containment system is functioning properly.

Preliminary Assessment (PA): The process of collecting and reviewing available information about a known or suspected hazardous waste site or release. EPA or states use this information to determine if the site requires further study. If further study is needed, a **site inspection** is undertaken.

Quality Assurance/Quality Control (QA/QC): A system of procedures, checks, audits, and corrective actions used to ensure that field work and laboratory analysis during the investigation and **cleanup** of **Superfund** sites meet established standards.

Record of Decision: A public document that explains which **cleanup** alternative(s) will be used at **National Priorities List** sites where the Trust Fund pays for the cleanup. The Record of Decision is based on information and technical analysis generated during the **remedial investigation/feasibility study** and **consideration of public comments and community concerns**.

Remedial Actions (RA): The actual construction or implementation phase that follows the remedial design of the selected cleanup alternative at a site on the **National Priorities List**.

Remedial Design (RD): An engineering phase that follows the Record of Decision when technical drawings and specifications are developed for the subsequent remedial actions at a site on the **National Priorities List**.

Remedial Investigation/Feasibility Study:
Two different but related studies. They are usually performed at the same time and together referred to as the "RI/FS." They are intended to:

- Gather the data necessary to determine the type and extent of contamination at a Superfund site:
- Establish criteria for cleaning up the site.
- Identify and screen cleanup alternatives for remedial action; and
- Analyze in detail the technology and costs of the alternatives.

Responsiveness Summary: A summary of oral and/or written public comments received by EPA during a **comment period** on key EPA documents, and EPA's responses to those comments.

Risk Assessment: An evaluation performed as part of the **remedial investigation** to assess conditions at a Superfund site and determine the risk posed to public health and/or the environment.

Site Inspection (SI): A technical phase that follows a **preliminary assessment** designed to collect more extensive information on a hazardous waste site. The information is used to score the site with the **Hazard Ranking System** to determine whether response action is needed.

Superfund: The common name used for the **Comprehensive Environmental Response Compensation, and Liability Act**. A federal law passed in 1980 and modified in 1986 by the Superfund Amendment and Reauthorization Act. The Acts created a special tax that goes into a Trust Fund, commonly known as **Superfund**, to investigate and clean up abandoned or controlled hazardous waste sites. Under the program, EPA can either:

- Pay for site **cleanup** when parties responsible for the contamination cannot be located or are unwilling to unable to perform the work.

- Take legal action to force parties responsible for site contamination to clean up the site or pay back the federal government for the cost of the cleanup.

AGENDA

U.S. ENVIRONMENTAL PROTECTION AGENCY PUBLIC MEETING
JUNE 18, 1991

UNION PACIFIC RAILROAD SLUDGE PIT SUPERFUND SITE POCATELLO, IDAHO

I.	INTRODUCTION	BUB LOISELLE
II.	TECHNICAL PRESENTATION	ANN WILLIAMSON
III.	QUESTIONS AND ANSWERS	BUB LOISELLE ANN WILLIAMSON
IV.	ORAL COMMENTS FOR THE RECORD	GENERAL PUBLIC

EPA
Region 10
1200 Sixth Avenue
Seattle WA 98101

Alaska
Idaho
Oregon
Washington

Superfund Fact Sheet

June 3, 1991

The Proposed Plan
Union Pacific Railroad Sludge Pit
Pocatello, Idaho

Public Comment Period on Cleanup Alternatives
June 7, 1991 to July 8, 1991

Public Meeting to Discuss Cleanup Alternatives
June 18, 1991 at 7:00 p.m.
Quality Inn Convention Center
1555 Pocatello Creek Road
Pocatello, Idaho

Introduction

This fact sheet describes the alternatives for addressing contamination at the Union Pacific Railroad (UPRR) Sludge Pit site in Pocatello, Idaho. In addition, it highlights the U.S. Environmental Protection Agency's preferred alternative or "**proposed plan**" for cleanup.

The proposed plan is the document which describes the preferred alternative for remediation at the UPRR Sludge Pit. This proposed plan was developed after completion of the remedial investigation and feasibility study (RI/FS) required by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). The Superfund process includes the following phases, which were completed prior to the proposed plan: (1) an investigation of the nature and extent of contamination in sludge, soil, surface water, air, groundwater, and to biota (RI); (2) a risk assessment to estimate potential effects of contamination on human health and the environment (Human Health and Ecological Risk Assessments); and (3) an FS to evaluate the alternatives for cleanup of the contamination. The Environmental Protection Agency (EPA), in collaboration with the Idaho Department of Health and Welfare (IDHW), coordinated efforts during this process.

This proposed plan requires public comment-your views and suggestions-before EPA can proceed further. You are invited to comment in writing, attend the public meeting noted above where a presentation of the cleanup alternatives will be given, or both. Written comments should be sent to:

Ann Williamson
Environmental Protection Agency
1200 Sixth Avenue, HW-113
Seattle, Washington 98101

To assist your analysis of the proposed plan, other reports and studies on the UPRR Sludge Pit can be reviewed at the information repositories listed on page 14 of this fact sheet. After the public comment period has ended, your comments will be considered when developing the final cleanup plan. The preferred alternative may be modified as a result of public comment. In accordance with CERCLA Section 120, EPA in collaboration with IDHW, will select the final cleanup plan. If EPA and IDHW are unable to reach an agreement on the cleanup plan, the selection is made by EPA.

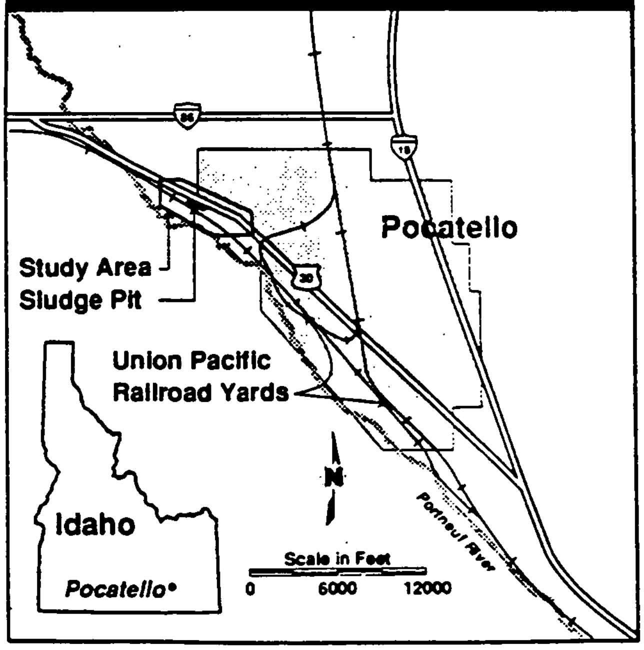
EPA's preferred remedy is Alternative 5, described in detail on page 14 of this proposed plan. A summary of this alternative's cleanup activities includes: (1) excavation and transportation of contaminated sludge, silt and soils offsite for disposal at a Resource Conservation and Recovery Act (RCRA) approved landfill; (2) backfilling of the pit with clean material and construction of a low permeability cap; (3) groundwater extraction and treatment using oil/water separation and dissolved air flotation; (4) partial treatment of any remaining contaminated soils by soil flushing using clean water circulated through an infiltration gallery system followed by groundwater treatment; (5) provision of an alternate drinking water supply; land and water use restrictions; long-term groundwater monitoring, and; air monitoring and dust control. The estimated cost of cleanup is $3,797,550.

Overview of Investigation

The one-acre site is located north of UPRR's West Pocatello Railroad Yard, which covers a few hundred acres and is northwest of the city of Pocatello, Idaho. The site is bounded by U.S. Highway 30 to the north and the Portneuf River to the south, in a light industrial/commercial setting (see maps on pages 2 & 3). Residential areas are located northeast of the site across U.S. Highway 30.

Union Pacific Railroad (UPRR) has owned and operated a rail yard on the property since the turn of the century. Typical activities there include train maintenance, repair, assembly, refueling, diesel engine repair and track maintenance.

Map 1:
Union Pacific Railroad Sludge Pit Location



UPRR operates an onsite wastewater treatment plant (oil/water separator and dissolved air flotation unit). The treatment plant receives water from all rail yard storm drains and from many building floor drains. This plant treats onsite, industrial railroad wastes exclusively. Between 1961-1983, approximately 3,000 gallons per week of sludge from the treatment plant were disposed in an unlined pit. Sludge thickness ranges from 1.5 to 4.4 feet, with an estimated total volume of 2,500 cubic yards.

In 1983, an EPA site investigation found that seepage from the sludge pit and an old tie treating facility contributed to groundwater contamination. Samples from nearby, domestic wells contained low levels of organic compounds consistent with the wastes discharged to the pit. As a result of the investigation, the site, which has become known as the UPRR Sludge Pit, was placed on the EPA's National Priority List in 1984.

During 1990, UPRR finalized the Remedial Investigation (RI), as well as the Human Health and Ecological Risk Assessments. The Feasibility Study (FS) was completed early in 1991. The RI/FS contains the results of the entire investigation and describes the alternatives for cleanup. All of the RI/FS reports are available for review at the information repositories listed on page 14.

Significant findings of the RI are summarized below:

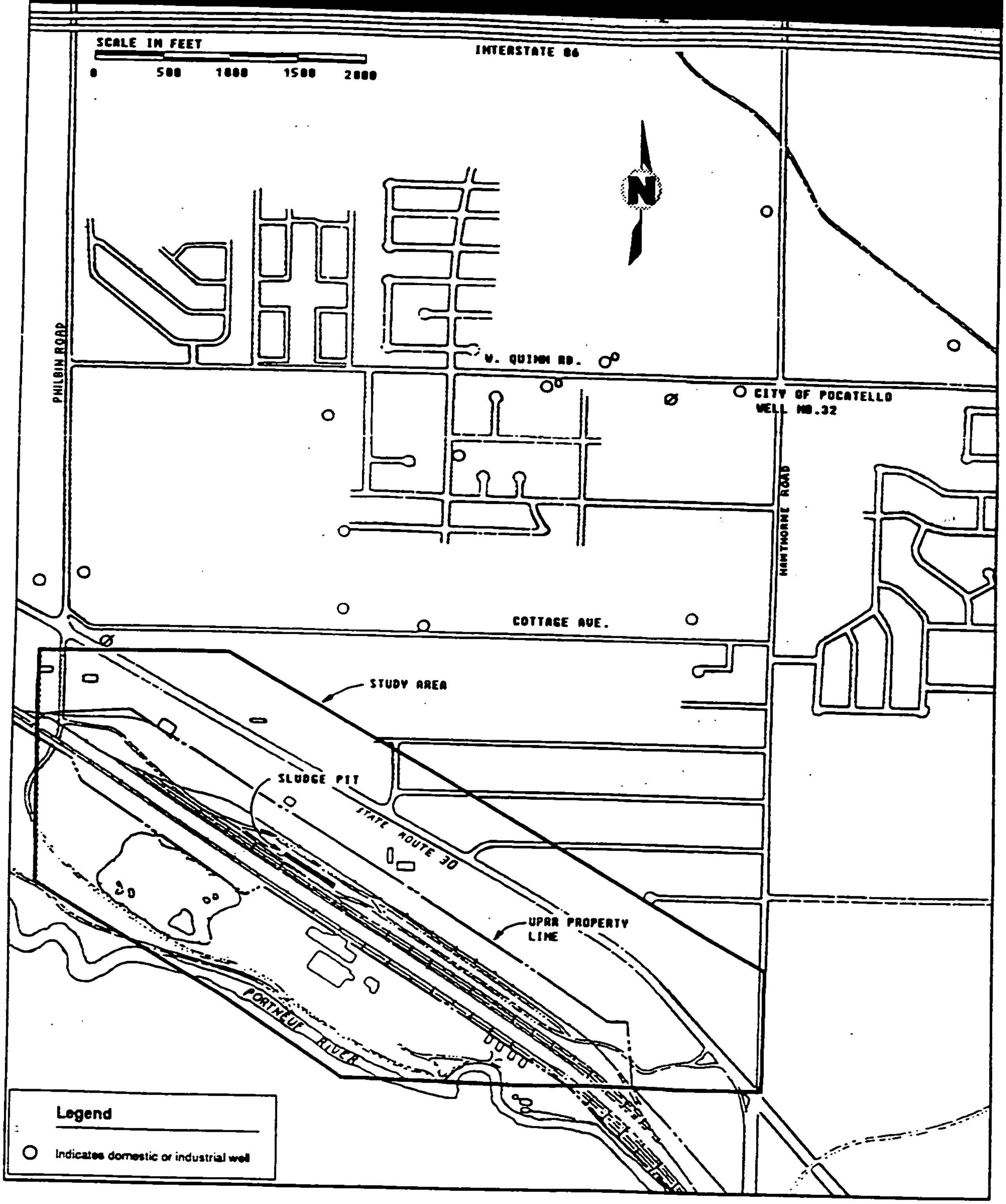
Nature and Extent of Contamination

- **Sludge (solids and liquids) material** found in the pit were sampled for volatile and semivolatile organics, metals, pesticides, and polychlorinated biphenyls (PCBs). Test results indicate that the sludge contains heavy metal contaminants, volatile organic compounds (VOCs) and semivolatile compounds at relatively low concentrations. Present concentrations range from a high of 1460 parts per million (ppm) (lead) to a low of 0.013 ppm (carbon tetrachloride). Cleanup goals for these contaminants are 500 ppm and 0.21 ppm, respectively.

  Leach test results suggest that rain or snow melt percolating through the sludge may leach various organic contaminants from the sludge into the underlying soil and groundwater.

- **Soils** directly adjacent to and beneath the sludge pit were found to be contaminated with petroleum hydrocarbons, other volatile and semivolatile compounds, and various heavy metals. Present concentrations range from a high of 717 ppm (manganese) to a low of 0.006 ppm (carbon tetrachloride). Cleanup goals for these contaminants are 0.28 ppm and 0.21 ppm, respectively.

Map 2:
Sludge Pit and Study Area



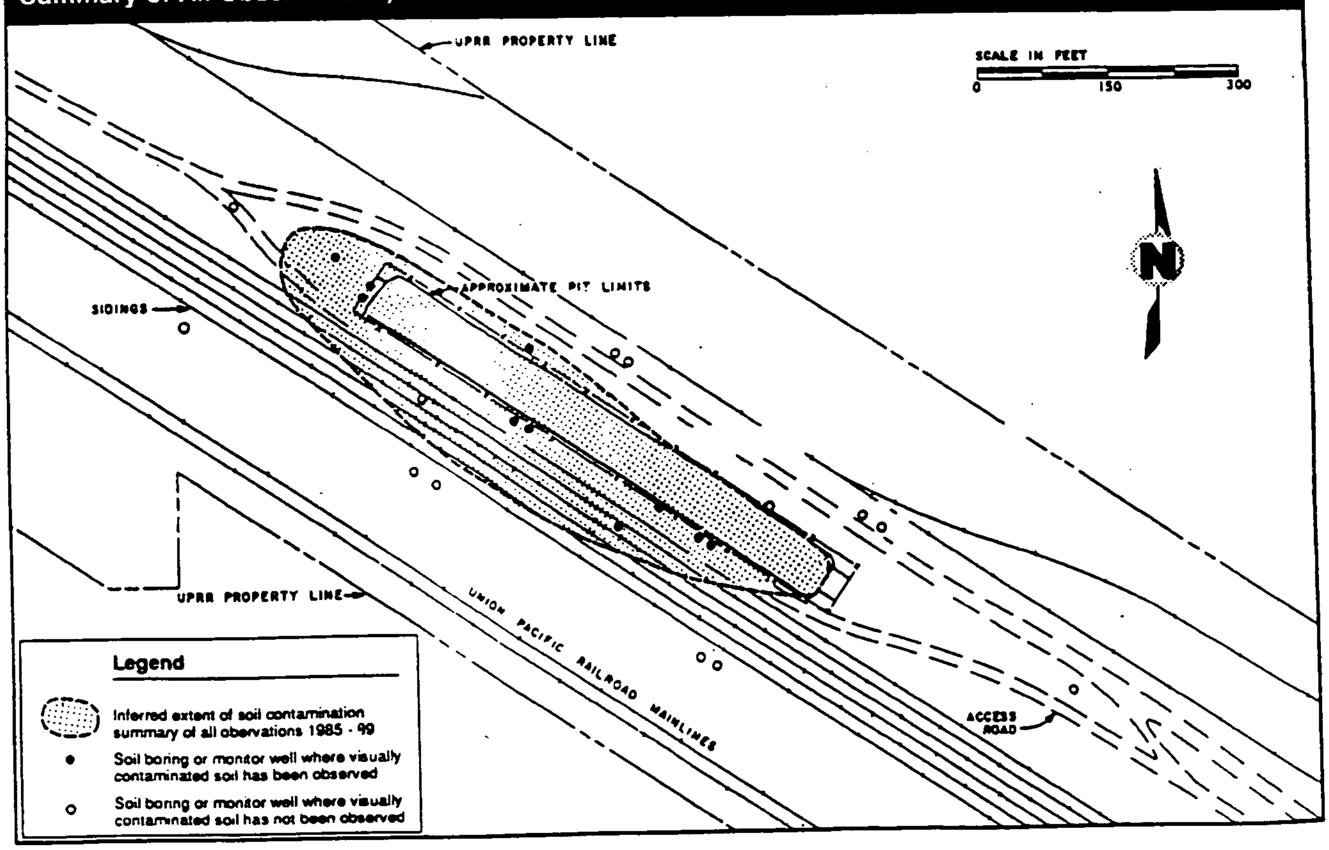
Soil contamination extends as deep as 42 feet below the sludge pit and into the Upper Aquifer. Figure 1 below indicates the estimated extent of soil contamination based on a summary of all data from 1985-1989.

- **Groundwater** beneath the sludge pit occurs in two distinct water bearing zones (Upper and Lower Aquifer). They are separated by a clay layer. The regional groundwater flow direction is generally to the northwest. The Lower Aquifer is a very productive drinking water source used by local private residents, businesses, and the City of Pocatello (Supply Well No. 32). No water supply wells in the area have been identified as originating from the Upper Aquifer.

  The Upper Aquifer is contaminated with organic compounds in the form of nonaqueous phase liquids (NAPL). The NAPL layer, which floats on the surface of the groundwater below the pit, is similar in composition to a medium weight fuel or lubricating oil and is approximately 2 inches thick. Sampling of wells in the Upper Aquifer indicates the presence of a small, seasonal contaminant plume associated with the NAPL. Figure 2 on page 5 indicates the estimated extent of NAPL floating on the surface of the groundwater based on observations made from 1985-1989.

  Low levels of several chlorinated VOCs were detected in most Upper and Lower Aquifer wells near the sludge pit and in several, offsite drinking water supply wells, both upgradient and downgradient of UPRR wells. Metals, such as lead, were also found in the private, offsite wells and UPRR wells. All contaminant concentrations of metals and VOCs were below their respective federal, primary drinking water maximum contaminant levels (MCLs) and current maximum contaminant level goals (MCLGs).

Figure 1:
Inferred Extent of Soil Contamination
Summary of All Observations, 1985 - 1989



- **Surface water** bodies investigated included the Portneuf River, an irrigation canal, intermittent ponds in the gravel pit southwest of the sludge pit, and water observed in the sludge pit. Studies indicate that neither surface water nor groundwater from the site impact the quality of water in the Portneuf River, Swanson Road Spring and Batiste-Papoose Spring.

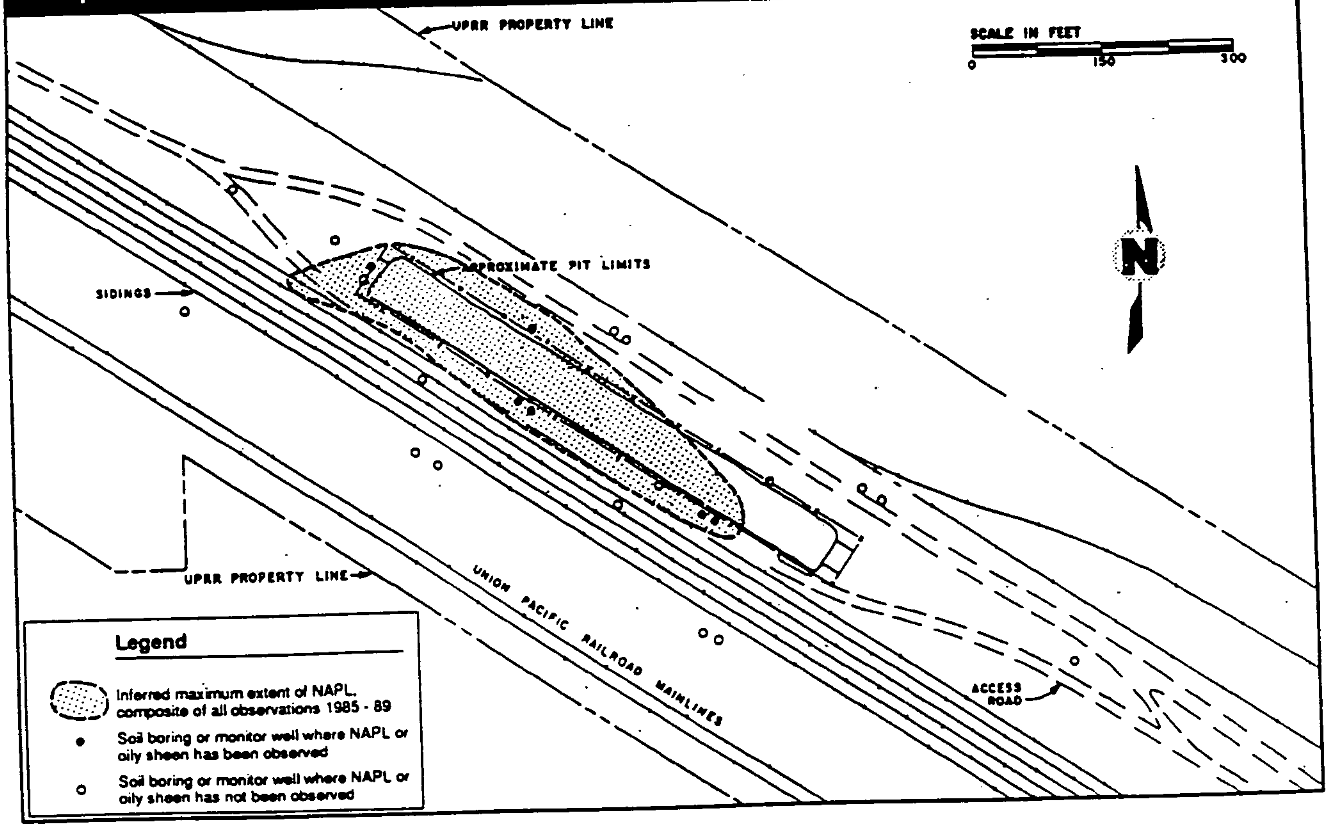
- **Air** quality was not monitored at the site, consequently, current impacts are unknown. However, air quality data (such as wind speed, wind direction, etc.) was collected for use in estimating volatile and dust emissions as part of the risk assessment.

- **Biota** impacts were qualitatively evaluated in and around the study area. No negative impacts were observed and future impacts are not expected.

Summary of Health and Environmental Risk

As part of the investigation, Union Pacific Railroad evaluated the potential human health and environmental risks due to contamination from the UPRR Sludge Pit site. This assessment uses conservative assumptions to determine risk, such as daily exposure to the contaminants for 75 years. The risk assessment also considered any changes in land or groundwater use that may occur in the future. According to federal and state hazardous waste laws, an acceptable risk is generally defined as a risk within in a range that does not exceed one additional chance of cancer in 10,000 to one additional chance of cancer in 1,000,000 for a person exposed to site conditions. This risk from exposure to a site is in addition to the normal cancer rate of 1 in 4 people. For noncancer-causing contaminants, acceptable levels are generally those to which the human population may be exposed during a lifetime of 75 years without adverse effects.

Figure 2:
Inferred Maximum Extent of NAPL on Groundwater
Composite of All Observations, 1985 - 1989



Current and Future Human Health Risks: Arsenic, chromium, cadmium, beryllium and polycyclic aromatic hydrocarbons (PAHs) are the contaminants which could pose the greatest risk of cancer or other adverse human health effects at the site. The risk assessment indicates that exposure to these contaminants in air, sludge/silt/soil, and groundwater could pose an unacceptable risk to residents and workers. However, no one currently resides onsite and the nearest residences are approximately 0.3 mile northeast of the site; the pit area is no longer used by UPRR workers; and, the Upper Aquifer is not used as a drinking water source in Pocatello.

Cumulative risk, which is the sum of risks across pathways (i.e. air, soil ingestion and dermal contact) was estimated for both the current and future industrial and residential land-use scenarios. Current site risks are estimated to be 3 additional chances of cancer in 1,000,000 for an offsite resident and 4 additional chances of cancer in 100 for an onsite industrial worker, given existing site conditions. Future site risks are estimated to be 6 additional chances of cancer in 100 for a person residing onsite and 5 additional chances of cancer in 100 for an onsite industrial worker, based on no cleanup.

Ecological Risk: No threatened or endangered species of animals or plants are known to inhabit the UPRR Sludge Pit. Impacts to the Portneuf River, the Swanson Road Spring and Batiste-Papoose Spring from surface water runoff were found to be nonexistent.

Principal Threats

CERCLA remedial actions are expected to include treatment of wastes that pose principal threats at a site, wherever practical. Generally, principal threats are attributable to wastes which cannot be reliably controlled in place such as liquids, highly mobile materials (e.g. cleaning solvents), or compounds at highly toxic concentrations.

For this site, the following principal threats may include some metals, semivolatile organic compounds and tentatively identified organic compounds in the nonaqueous phase liquids (NAPL); volatile and semivolatile organic compounds in groundwater; and, some metals (such as arsenic) and polycyclic aromatic hydrocarbons (PAHs) in the sludge and underlying soils at the site.

Cleanup Goals

The results of the RI and the risk assessment were used to establish the goals that define the extent of cleanup required by state, local and federal law. In establishing these cleanup goals, a variety of federal, state and local laws and regulations as well as the results from the risk assessment were used. These laws and regulations comprise the applicable or relevant and appropriate requirements (ARARs); a list of ARARs for this site can be found in Appendix D of the Feasibility Study. If the cleanup goals differ between the federal and state law, the cleanup goal is set at the more stringent level.

In accordance with federal and state law, the cleanup goals at UPRR have been set at a level that does not exceed one additional chance of cancer in 1,000,000 for a person exposed to site conditions. For non-carcinogenic effects, the levels are set such that no adverse effects are anticipated based on a 75-year lifetime exposure. This includes exposure via all potential routes-sludge/soil, groundwater, surface water, and air.

Cleanup levels for contaminants found in the sludge/soil and groundwater were calculated based on protection of human health and the environment. These levels are called target concentrations and will generally be used to determine when cleanup goals have been achieved. If additional sampling indicates that either laboratory detection limits or naturally occurring levels of chemicals in soil or groundwater exceed risk-based cleanup goals, the detection limits or background concentrations will be used instead of the risk-based values to establish remediation targets.

Specific cleanup goals for contaminants identified in the groundwater and sludge/soil can be found in the Feasibility Study, Tables 2-11 through 2-22.

Cleanup Alternatives

A wide range of sludge/soil and groundwater remedial alternatives were evaluated as part of the FS. Several alternatives were eliminated early in the screening process because it was readily apparent that they would not effectively address contamination, could not be implemented, or would have had excessive cost compared to an alternative that would achieve the same degree of protection or level of effectiveness. After this screening process was complete, twelve remedial alternatives remained for detailed analysis. Table 1 on page 7 lists each of the proposed alternatives and identifies the elements of each.

These alternatives consider four treatment options for sludge/soil:

--excavation and offsite disposal

--excavation, offsite disposal and capping

--onsite solidification

--incineration

In addition, contaminated groundwater will be treated either by:

--oil/water separation and dissolved air flotation (DAF)

--oil/water separation and carbon adsorption

All alternatives, except Alternative 1 (No Action) and Alternative 2 (Institutional Controls), have the following features in common:

- --soil flushing
- --air monitoring and dust control measures during construction
- --alternate onsite drinking water supply, if necessary
- --post-construction institutional controls maintained by UPRR and operation and maintenance (O & M)

In addition to the cleanup actions identified in the alternatives, EPA and IDHW are requiring supplemental groundwater sampling. Contaminants found in groundwater are below both MCLs and MCLGs. However, treatment of the upper groundwater aquifer is necessary to prevent migration of NAPL and other contaminants to the lower aquifer and to remove NAPL and other contaminants which exceed **proposed** MCLs and MCLGs.

Based on the results of the sampling, the need for additional groundwater treatment will be considered.

The following twelve remedial groundwater and sludge/soil remedial alternatives were evaluated. Costs for all alternatives are estimates only and fell within the -30 to +50 percent range.

Alternative 1: *No Action.*

Capital Cost	**-0-**
O & M	**$635,300**
Total (Present Worth)	**$635,300**

The No-Action Alternative is required by law to be developed and acts as a baseline for comparison with the cleanup alternatives. Under this alternative, no action would be taken to clean up contaminated sludge, silt, soils or groundwater. However, a long-term groundwater monitoring program would be implemented to monitor movement of the contamination plume.

Table 1
Elements of Proposed Alternatives

Remedy Elements	Proposed Alternatives 1	2	3	4	5*	6	7	8	9	10	11	12
Groundwater (GW) Monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Institutional Controls		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dust Control and Air Monitoring			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Backfilling of Pit with Clean Material			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alternative Drinking Water Supply		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GW Extraction & Soil Flushing			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
GW Treatment by Oil/Water Separation & Dissolved Air Flotation (DAF)			✓		✓		✓		✓		✓	
GW Treatment by Oil/Water Separation & Carbon Adsorption				✓		✓		✓		✓		✓
Off-Site GW Discharge			✓		✓		✓		✓		✓	
On-Site GW Discharge				✓		✓		✓		✓		✓
Low Permeability Cap					✓	✓	✓	✓				
Soil Excavation Off-Site Disposal			✓	✓	✓	✓						
Soil Excavation Solidification							✓	✓				
On-Site Soil Incineration									✓	✓		
Off-Site Soil Incineration											✓	✓

* *EPA/IDHW Preferred Alternative*

Alternative 2: *Institutional Controls.*

Capital Cost	**$33,150**
O & M	**$636,700**
Total (Present Worth)	**$669,850**

This alternative involves surrounding the sludge pit with a six-foot chain link fence. Land and water use restrictions would be added to the property deed to prohibit current and future landowners from disturbing the site and from using the site groundwater resources.

Alternative 3: *Excavation & Offsite Disposal/Groundwater Treatment via Oil/Water Separation and Dissolved Air Flotation (DAF)/Soil Flushing/Offsite Discharge/Institutional Controls/Air Monitoring & Dust Control.*

Capital Cost	**(up to) $4,894,208**
O & M	**$1,624,300**
Total Cost (Present Worth)	**(up to) $6,518,508**

This alternative is designed to reduce potential human and environmental exposure to contaminants contained in the sludge. By removing the sludge, the source of contamination to groundwater beneath the pit will be significantly reduced.

In addition, this alternative is designed to prevent offsite migration of contaminated groundwater.

The alternative consists of excavating sludge and soil, transporting it to an approved landfill, and backfilling the pit and other excavated areas with clean fill. Because the vertical and horizontal extent of this contamination is presently unknown, sampling of the underlying and surrounding soil would be performed periodically during excavation, with the results determining whether to excavate further in order to meet cleanup goals.

Although it is intended that all contaminated sludge and soil which exceed cleanup goals will be excavated, this may not be feasible due to subsurface conditions. Current estimates indicate that approximately 4,200 cubic yards of sludge and soil could be removed from the pit and surrounding areas. Therefore, contaminants may remain in soils beneath the excavated area. Soil flushing, using uncontaminated water from Batiste Springs, would be used to flush contaminants beneath the excavated area to the groundwater surface via infiltration galleries. By using a system of perforated drains, the water would infiltrate into and through the unsaturated soil down to the Upper Aquifer where it would be captured with groundwater extraction wells and pumped to the surface for treatment.

Treatment of groundwater and nonaqueous phase liquids (NAPL) would involve using an oil/water separator to skim off floating oil. The wastewater would then be run through the onsite dissolved air flotation unit (DAF) for removal of primarily emulsified oil, semivolatile organic compounds and, metals in the NAPL before discharge to the Pocatello publicly owned treatment works (POTW). Organic contaminants remaining in the wastewater will receive biological treatment at the POTW. Skimmed oil will be kept in an onsite holding tank for sale to a recycler.

An alternate drinking water supply system would be provided to serve potential future businesses and/or residents moving onto the site property. Air monitoring and dust control measures will be implemented during site cleanup activities to reduce emissions and to ensure the protection of site workers, nearby workers and residents. The dust control measures may include spraying the ground surface with clean water or an approved chemical suppressant. Long-term groundwater monitoring and deed restrictions would be required.

Alternative 4: *Excavation & Offsite Disposal/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs	**(up to) $5,689,163**
O & M	**$4,130,400**
Total (Present Worth)	**(up to) $9,819,563**

Treatment of the sludge and soil contamination in Alternative 4 is identical to the treatment discussed in Alternative 3. The groundwater treatment and disposal method in Alternative 4, however, would involve carbon adsorption and onsite discharge rather than dissolved air flotation and offsite discharge. The carbon adsorption system would enhance groundwater cleanup by specifically removing organic contaminants.

The extracted groundwater would be pumped from the oil/water separator to the carbon adsorption unit for further treatment. The carbon adsorption system brings the contaminated groundwater into direct contact with activated carbon by passing the water through carbon containing vessels. The activated carbon selectively adsorbs hazardous organic particles. The treated water would then be routed to the infiltration galleries for use in the soil washing process. Used carbon would be recycled offsite through combustion at an approved regeneration facility.

The alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 5: *Excavation & Offsite Disposal/Low Permeability Cap/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $2,139,650
O & M $1,657,900
Total (Present Worth) .... (up to) $3,797,550

This alternative is designed to reduce the primary source of contamination at the site by excavating contaminated sludge and soil to a depth that is technically practical, backfilling the excavated area with clean fill and covering it with a low permeability cap. It is assumed that only visible sludge (i.e. material that is discolored or noted to have the consistency of sludge) and underlying silt, up to a maximum of 4,200 cubic yards, would be removed.

Soil flushing and groundwater extraction and treatment using the existing onsite oil/water separator and DAF unit, infiltration galleries, alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 6: *Excavation & Offsite Disposal/Low Permeability Cap/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $2,820,750
O & M $4,164,000
Total (Present Worth) .... (up to) $6,984,750

Alternative 6 combines the contaminated sludge/soil excavation, offsite disposal and capping remedial activities described in Alternative 5 with the carbon adsorption groundwater treatment system described in Alternative 4. The alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 7: *Sludge Solidification/Low Permeability Cap/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $6,410,850
O & M $1,643,500
Total (Present Worth) .... (up to) $8,054,350

This alternative is designed to treat the contaminated sludge and soil in, around and below the pit. Under this option, sludge and contaminated soils would be excavated to a depth that is technically practical and mixed with stabilizing agents such as fly ash, lime, cement or proprietary chemicals to immobilize contaminants. An onsite landfill will be constructed for disposal of the solidified sludge and soil. To prevent possible future leaching of contaminants from the solidified mass to the groundwater, the landfill cell will be double lined and contain a leachate collection system. The entire landfill will be covered with a low permeability cap.

Soil flushing and groundwater extraction and treatment using the existing onsite oil/water separator and DAF unit, infiltration galleries, alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 8: *Sludge Solidification/Low Permeability Cap/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $7,195,950
O & M $4,149,600
Total (Present Worth) .. (up to) $11,345,550

This alternative combines the sludge solidification and its onsite disposal in a specially constructed landfill as described in Alternative 7 with the carbon adsorption groundwater treatment system described in Alternative 5.

The alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 9: *Onsite Incineration/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $23,240,950
O & M $1,624,300
Total (Present Worth) .. (up to) $24,865,250

This alternative is designed to treat contaminated sludge and soil in the pit which is the major source of groundwater contamination. Soil exceeding cleanup goals and sludge within the pit would be excavated and incinerated in an onsite incinerator. Ash would be transported and disposed in an approved landfill. Procedures for determining the extent of contamination of the underlying and surrounding soil and commensurate excavation, backfilling and grading are identical to those described in Alternative 3.

Soil flushing and groundwater extraction and treatment using the existing onsite oil/water separator and DAF unit, infiltration galleries, alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Alternative 10: *Onsite Incineration/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $23,786,250
O & M $4,130,600
Total (Present Worth) (up to) $27,916,850

This alternative combines the carbon adsorption groundwater treatment system remedial action described in Alternative 4 and the onsite incineration of contaminated sludge and soil described in Alternative 9. The remaining remedial features of this alternative are also described in Alternative 3.

Alternative 11: *Offsite Incineration/Groundwater Treatment via Oil/Water Separation and DAF/Soil Flushing/Offsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $38,662,850
O & M $1,624,300
Total (Present Worth).. (up to) $40,287,150

This alternative is designed to treat contaminated sludge and soil in the pit which is the major source of groundwater contamination. Soil exceeding cleanup goals and sludge within the pit would be excavated and incinerated in an offsite incinerator. Ash would be disposed in an approved landfill. Procedures for determining the extent of contamination of the underlying and surrounding soil and commensurate excavation, backfilling and grading are identical to those described in Alternative 3.

Soil flushing and groundwater extraction and treatment using the existing onsite oil/water separator and DAF unit, infiltration galleries, alternate drinking water supply system, institutional controls, dust control and air monitoring are also included in this alternative as described in Alternative 3.

Table 2:
Evaluation of Remedial Alternatives

In the Feasibility Study, nine criteria are used to evaluate and compare alternatives. These nine criteria are:

1. **Overall Protection of Human Health and the Environment** - How well does the alternative protect human health and the environment?
2. **Compliance with Regulations** - Does the alternative meet all applicable or relevant and appropriate state and federal laws (ARARs), or if not, is a waiver justified?
3. **Short-term Effectiveness** - Are there potential adverse effects to either the community, site workers or the environment during construction or implementation of the alternative? How fast does the alternative reach the cleanup goal?
4. **Long-term Effectiveness and Permanence** - How well does the alternative protect human health and the environment after cleanup goals have been reached? What, if any, risks will remain at the site? What is the adequacy and reliability of controls?
5. **Reduction of Toxicity, Mobility, or Volume** - Is the toxicity, mobility, or volume of the hazardous substance significantly reduced through treatment? What are the type and quantity of residuals remaining? What is the degree of expected reductions, and to which treatment is irreversible?
6. **Implementability** - Is the alternative both technically and administratively feasible? Has the technology been used successfully on other similar sites?
7. **Cost** - What are the estimated present worth costs of the alternative?
8. **State Acceptance** - What are the state's comments or concerns about the alternatives considered and about the preferred alternative? Does the state support or oppose the preferred alternative?
9. **Community Acceptance** - What are the community's comments or concerns about the alternatives considered and about the preferred alternative? Does the community generally support or oppose the preferred alternative?

Alternative 12: *Offsite Incineration/Groundwater Treatment via Oil/Water Separation and Carbon Adsorption/Soil Flushing/Onsite Discharge/Alternate Drinking Water Supply/Institutional Controls/Air Monitoring & Dust Control.*

Capital Costs .... (up to) $39,208,150
O & M $4,130,600
Total (Present Worth).. (up to) $43,338,750

This alternative combines the carbon adsorption groundwater treatment system remedial action described in Alternative 4 and the offsite incineration of contaminated sludge and soil described in Alternative 11. The remaining remedial features of this alternative are also described in Alternative 3.

Comparative Analysis of Alternatives

These criteria, as defined in Table 2, are used to compare the alternatives to determine their relative performance and to identify their respective advantages and disadvantages.

1. Overall Protection of Human Health and the Environment:

All of the alternatives except Alternative 1 (no action) and Alternative 2 (institutional controls) appear to be protective of human health and the environment. However, although excavation is involved, Alternatives 3-6 (sludge/soil removal and offsite disposal) primarily treat the contaminated groundwater, with only limited treatment of the contaminated sludge and soil.

Of the two groundwater treatment systems proposed in the alternatives, carbon adsorption would enhance groundwater cleanup by specifically removing organic contaminants. Under the dissolved air flotation (DAF) treatment scenario, biological treatment at the Pocatello POTW is further expected to remove additional organic contaminants.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs):

Alternative 1 (no action) and Alternative 2 (institutional controls) will not meet ARARs. Alternatives 3-12 comply with the applicable or relevant, and appropriate requirements (ARARs) in varying degrees. ARARs identified for this site, which are currently under consideration, appear in the discussions which follow.

Tests performed on the sludge and soil indicate it is not a Resource Conservation and Recovery Act (RCRA) waste. Therefore, land disposal restrictions do not apply nor do RCRA landfill closure requirements.

All of the alternatives should meet state and federal air quality standards for visible emissions and fugitive dust, as each alternative includes dust control measures.

With the exception of Alternatives 1 and 2, all of the alternatives include groundwater extraction, treatment, and discharge process options that will meet both federal and state water quality ARARs for groundwater, drinking water, and leaching. Alternatives 3, 5, 7, 9 and 11 will require an increase to UPRR's current wastewater discharge limit with the City of Pocatello. All of these alternatives use offsite discharge of treated wastewater to the Pocatello publicly owned treatment works (POTW).

3. Short-Term Effectiveness:

Alternatives 3-12 pose some short-term risk to the community and site workers associated with the disturbance of contaminated dust generated during remedial activities. However, dust control measures and air monitoring are expected to minimize these effects. Additionally, short-term compliance with air quality standards could be more difficult for the solidification and incineration alternatives (Alternatives 7-8, and 9-12, respectively) than other alternatives due to air process emissions associated with those treatment options.

No adverse environmental impacts are expected as a result of implementing any of the alternatives under evaluation.

Excavation, backfilling of excavated areas, and transport and disposal of contaminated sludge and soil is estimated to take ten (10) months. If excavation in Alternatives 3 and 4 continues beyond the estimated maximum of 4,200 cubic yards, then Alternatives 5 and 6 may be faster to implement than Alternatives 3 and 4, and the other alternatives, thus providing protection in a shorter timeframe.

While the groundwater remediation is expected to last at least five (5) years, cleanup will begin immediately and the greatest improvements in groundwater quality should be made in the first two years. However, short-term risks may initially rise due to the increased mobility of some contaminants as a result of soil flushing.

4. Long-Term Effectiveness and Permanence:

With the exception of Alternatives 1 and 2, all of the alternatives effectively and permanently reduce the risks associated with the inhalation, dermal contact, and ingestion of contaminated sludge and soil. Additionally, capping included in Alternatives 5-8 reduces the amount of water available for leaching contaminants into the subsurface after soil flushing has been completed. O & M costs associated with cap maintenance have been calculated for a period of 30 years.

Because contaminants in sludge and soil will be contained but not destroyed, remedial activities associated with Alternatives 3-6 do not entirely meet the stated preference of the Superfund law which calls for utilization of permanent solutions and treatment to the maximum extent practicable.

The groundwater extraction and treatment systems and the alternate water supply included in Alternatives 3-12 address groundwater threats by remediating the Upper Aquifer and by providing a clean drinking water source, if necessary, for potential future onsite users. The groundwater treatment system will further reduce the potential for any contaminants to reach the Portneuf River.

5. Reduction of Toxicity, Mobility, or Volume Through Treatment:

The "No Action" Alternative and Alternative 2 (institutional controls) do not reduce any of the properties (i.e. toxicity, mobility, or volume) of the contamination. For all other alternatives, reductions in toxicity, mobility or volume will be accomplished through treatment to the extent practicable.

Alternatives 3-6 provide some treatment of contaminated soils through insitu soil washing below soils that have been excavated and disposed offsite. Alternatives 7-8 (solidification) reduce mobility and Alternatives 9-12 (incineration) reduce mobility and volume. Alternatives 9-12 may also reduce toxicity, however, metals remaining in the resulting ash are likely to increase in concentration.

6. Implementability:

All of the alternatives can be implemented with varying degrees of difficulty. Although Alternatives 3-4 and 9-12 assume contaminated sludge and soil will be excavated to cleanup goals, excavation of soils beneath the "visible" sludge may be very difficult, if not impractical, due to its extremely coarse nature (i.e. a dense mixture of gravel, cobbles, and boulders ranging up to 9 feet in diameter). Therefore, excavation will likely be limited to practicable depths. A limited excavation may be capable of meeting cleanup goals in some areas where silt is present. This is due to the fact that silt has a demonstrated low permeability and is capable of absorbing some contaminants.

The solidification alternatives (7 and 8) currently present significant implementation uncertainties due to the unknown reliability and effectiveness of solidification at the UPRR site and the potential for an increase in volume associated with the solidification process. None of these uncertainties can be fully addressed until a small scale test simulating site conditions is conducted.

Alternatives 3, 5, 7, 9 and 11 will require an increase to UPRR's current wastewater discharge limit with the City of Pocatello. All of these alternatives use offsite discharge of treated wastewater to the Pocatello POTW. Coordination between UPRR and the Pocatello POTW to obtain the necessary revisions to existing discharge permits has been initiated and it is expected to be administratively feasible.

Services and materials for implementing excavation, removal and disposal of, or solidification of, contaminated sludge and soil, and for installing a soil flushing system and a low permeability cap are expected to be available within the state of Idaho. An out-of-state landfill, with the capacity for handling excavated sludge and soil from the pit, has been identified. The waiting period to secure the use of an offsite or onsite incinerator is expected to be long, potentially causing unacceptable delays in implementation.

7. Cost:

Total cleanup costs for Alternative 5 (the preferred alternative) are estimated at $3,797,550. This alternative ranks in the middle among the 12 alternatives considered. The range of estimated costs is $635,300 (Alternative 1) to $43,338,750 (Alternative 12).

8. State Acceptance:

IDHW has reviewed all documents that are part of this proposed plan and support its presentation to the public. While reserving the right to amend or change its recommendation after review of public comment, IDHW supports the proposed plan as protective of Idaho's environmental laws and regulations.

9. Community Acceptance:

Community acceptance will be evaluated based upon comments received during the public comment period.

The Preferred Alternative

The preferred alternative is Alternative 5 as it appears to best satisfy EPA's nine criteria. Alternative 5 is protective of human health and the environment, complies with state and federal laws, and is cost effective. It utilizes a readily available technology to address sludge and soil contamination and a proven treatment system to provide a permanent solution to the groundwater contamination.

The major components of the preferred alternative are:

- excavation of "visible" sludge (i.e. material that is discolored or noted to have the consistency of sludge) and underlying silt up to a maximum of 4,200 cubic yards.
- testing of contaminated sludge and soil will be conducted prior to disposal to demonstrate compliance with land disposal restrictions (LDR) treatment standards.
- disposal at an approved offsite landfill located in Utah; excavated areas are backfilled with clean fill and graded.
- placement and maintenance of a low permeability, cap over the entire pit following excavation, backfilling and grading. Areas outside the pit that are excavated will be backfilled with clean fill and graded.
- extraction and treatment of groundwater and nonaqueous phase liquids via the onsite oil/water separator and a dissolved air flotation unit; wastewater discharged to the Pocatello publicly owned treatment works; clean water obtained from Batiste Springs for use in washing contaminated soils.
- alternate drinking water supply system provided, if necessary, to serve potential future onsite businesses and/or residences. Since businesses and residences do not exist onsite, installation of a new water supply is not immediately required.
- construction and maintenance for thirty years of a six-foot-high chain link fence around the pit to restrict public access to the site.
- placement of deed restrictions on land and groundwater use to protect the property and potential future businesses and/or residents following completion of the cleanup. UPRR will be responsible for maintaining these controls for as long as they own the property. UPRR is also responsible for ensuring that these deed restrictions remain in the deed upon sale of the property.
- long-term, on-site groundwater monitoring for a minimum of 30 years after cleanup levels are achieved.

How You Can Participate

EPA welcomes your comments on the proposed plan. You are encouraged to comment on all the alternatives considered, not just the preferred alternative. The selection of the preferred alternative is preliminary and could change in response to public comments or other new information.

All of the reports in this study are available at the information repositories listed on the back page. The Administrative Record for the study, which includes a complete record of all actions and decisions upon which the preferred alternative is based, is located at the Pocatello Public Library.

The public comment period begins on June 7, 1991 and will run for 31 days, until July 8, 1991. A public meeting is scheduled for Tuesday, June 18, 1991 at the Quality Inn Convention Center. At that time, EPA will provide an explanation of the cleanup alternatives and will be available to answer your questions. The meeting will also provide an opportunity for you to submit written or verbal comments on the proposed plan.

At the end of the comment period and after considering all public comment received, EPA, in collaboration with IDHW, will select a final cleanup plan. The selected cleanup plan is documented in the Record of Decision (ROD) which includes the Responsiveness Summary providing responses to all public comment received.

After the ROD is complete, a fact sheet presenting the Responsiveness Summary and the selected remedy will be mailed to all interested parties. The ROD, including the Responsiveness Summary, will also be placed in the local repositories.

For More Information Contact:

To Contact EPA Staff in Seattle:
Call Toll-Free: 1-800-424-4372

Ann Williamson, EPA Project Manager
(206) 553-2739

In Pocatello:

Boyd Roberts, State of Idaho
(208) 236-6160

Information Repositories

Southeast Idaho Health District Office
465 Memorial Drive
Pocatello, Idaho

Pocatello Public Library
812 East Clark Street
Pocatello, Idaho

U.S. Environmental Protection Agency Library
Park Place Building, 10th Floor
1200 6th Avenue
Seattle, Washington 98101

United States
Environmental Protection
Agency

Region 10 (HW-117-CR)
1200 Sixth Avenue
Seattle WA 98101

ERRATA SHEET FOR UPRR
PUBLIC HEARING TRANSCRIPT
JUNE 18, 1991

Page 2, line 6; "my" should be "My".

Page 4, line 15; "Superfunds" should be "Superfund".

Page 4, line 20; "you" should be "of".

Page 5, line 4; "have" should be inserted between "will Ann".

Page 6, line 24; "is" should be inserted between "site in".

Page 7, line 12; "it's" should be "This is".

Page 8, line 1; Insert a period after "parties" and capitalize "once".

Page 8, line 5; Delete "the".

Page 8, line 15: "sunlight" should be "unlined".

Page 12, line 7; "determine" should be "determination".

Page 14, line 4; "swales" should be "soils".

Page 15, line 14; "And" should be "In".

Page 17, line 21; "are" should be "is the".

Page 17, line 22; "alternatives" should be "alternative".

Page 19, line 2; "the" should be deleted.

Page 20, line 22; Insert a period "pit" and capitalize "with".

Page 20, line 23; Delete the period after "treatment" and insert a comma. Capitalize "we".

Page 21, line 14; "5" should be "6".

Page 23, line 21; "metal" should be "metals".

Page 24, line 22; Insert "a" after "by".

Page 28, line 22; "down" should be "on".

BEFORE THE ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:)

The Proposed Plan)

Union Pacific Railroad)
Sludge Pit

_______________________________)

The Public Meeting came on for hearing at 7:00 p.m., June 18, 1991, at the Quality Inn Convention Center, 1555 Pocatello Creek Road, Pocatello, Bannock County, Idaho.

BEFORE:

BUB LOISELLE

ANN WILLIAMSON

ORIGINAL

JUNE 18, 1991

7:08 A.M.

MR. LOISELLE: Good evening. I am going to try to speak without the use of the microphone because I think everybody can hear me.

my name is Bub Loiselle. I am with the Environmental Protection Agency in Seattle, Washington. I'll be the moderator for tonight's public meeting. With me tonight is Ann Williamson with EPA. Ann is a Superfund site manager or she is the person who manages the clean up of Superfund sites.

With us also is Boyd Roberts. Boyd is with the State of Idaho and Boyd will be available after the formal public meeting is over to answer any questions you may have regarding the state's involvement with the Superfund process at the Union Pacific Railroad site.

First I would like to welcome you to tonight's meeting. This public meeting is part of the Superfund process regarding the proposed plan for the Union Pacific Railroad Superfund site located here in Pocatello, Idaho. The proposed plan is the document that describes the EPA's preferred alternative for cleaning up the sludge pit at the Union Pacific Railroad site.

The purpose of the public meeting is so the agency can receive comments from the public regarding our preferred alternative for cleaning up the sludge pit located at that site. As well we also are interested in receiving comments on the eleven other alternatives that are part of the proposed plan.

The public comment for this particular proposed plan runs from June 7, 1991, to July 8, 1991, so for those of you who do not wish to submit oral comments this this evening, you will have an opportunity to submit written comments. And those comments should be submitted to Ann Williamson.

After the close of the public comment period EPA will consider all substantive comments that are received and we will put those in a responsiveness summary. The comments as well as the responsiveness summary will all be part of the final decision document that details the final cleanup remedy at the Union Pacific Railroad site.

We scheduled this public meeting for about two hours and I really don't think we will need that much time, but for those of you who do wish to speak, I would like to suggest that we keep the comments limited to somewhere between five and say, ten minutes so everyone who wishes to speak will have the opportunity to do so.

Also for your convenience we have provided copies of the proposed plan. They are located at the back table there. And if you would like to see additional information regarding the Superfund process at the UPRR site, information detailing the research and the investigation is available at the Pocatello Library, the public library on 812 East Clark Street, as well as if any of you wish to venture over into the great country of Seattle, we have a duplicate record there also.

There is also a sign-up sheet at the back of the room and for those of you who wish to receive information regarding the Union Pacific Railroad site, I encourage you to go ahead and sign up and get on our mailing list.

And also since the Superfund process can be so doggoned confusing, we provided a one-page handout back there and it's entitled Superfunds Glossary on one side. It kind of tells you what all the cute little buzz words are that we bureaucrats use when we get into these processes.

The other side is entitled Superfund Remedial Response Process. I think this document will kind you help you understand the overall Superfund process a little better and how it relates to the Union Pacific Railroad site.

That's my ten cent speech, so before we get into Ann Williamson's technical presentation on the Union

Pacific Railroad site, I would like to see if there are any questions or any clarifications that may be needed.

MR. JACKSON: Who will pay for the cleanup?

MR. LOISELLE: I will Ann address that. She is the technical person, and if she wishes to do that now, fine, or if you want to hold that until after her presentation, I will do whatever. Why don't you just hold that, then, until after that.

If there are no questions on my part, let me just go ahead and get started with the technical presentation and the comment portion of this meeting.

So let me officially state for the record that this is a public meeting regarding the proposed plan detailing the cleanup alternatives for the Union Pacific Railroad sludge pit.

Today's date is June 18, 1991.

Now I would like to introduce Ann Williamson. She will give you a technical overview of the site in question.

Thank you.

MS. WILLIAMSON: Thanks, Bub. I am glad to see that I have at least a few interested folks from the City of Pocatello or wherever you are from.

I am not going to use the mike either. I have been known to have a voice that carries, so if you can't hear me, let me know, but I am sure you will be able to.

What I would like to do is kind of break down my presentation into three components. The first component will be just an overview of what's happened up to this point, both in terms of the investigation, what we found out. And then what we are proposing, what the agency is proposing to do at the site in terms of remediation, how the Union Pacific Railroad will be involved in that process, and then finally what I would like to do is offer you the opportunity to ask questions that we can address where it's not something that you necessarily want to have on the record, if you don't want to make a presentation, feel free to ask questions. So, you know, if there is anything that you want to ask or that you want to know about the process or about this site in particular, feel free to ask me.

What I am going to try to do in my technical presentation is to follow what you have in the proposed plan. As Bub mentioned, it's in the back of the room. I will just kind of go through that. Most of my posterboard and the overheads that I have you can find in that document. If you want to follow along if you can't see, they are in the document.

Basically you know the site in Pocatello, that's why we are here. Specifically it's located off of

U.S. Highway 30 and you probably haven't seen it, or if you have tried to see it, you can't see it, because it's not something that's obvious from the highway. In fact the Pacific Hide & Fur property is directly north and a bit -- well, let's just say it's directly north of the sludge pit. And Great Western Malting is to the south. So it's sandwiched in between those two pieces of property.

Both that posterboard, which we will come and look at later, and this map give you kind of a better feel for exactly where that is, where the site is at. Here is the sludge pit, this black line. It's a residential area (indicating), and State Route 30 (indicating). So my discussion is going to be limited to that area which was investigated.

This is a Superfund site. It's listed on the national priorities list. That occurred back in 1984 officially. The reason for that is that groundwater contamination was suspected on the property and in fact was confirmed and the primary suspect for that contamination was the sludge pit. As a result of the listing of the site, the Union Pacific Railroad was contacted as a potentially responsible party and agreed to investigate the site. That process is part of the Superfund process and we go about that by looking for responsible parties, once they have been identified, we enter into legal agreements with them to perform remedial investigations and feasibility studies, and then they begin the process. And that's exactly what took place with the Union Pacific.

They evaluated not only the groundwater contamination but they looked at what was in the sludge pit, and the sludge pit was an active part of their facility, if you will, for approximately 22 years. It was used as a disposal site for treated wastewaters that they collected from their treatment -- or from their properties which they ran through a treatment, wastewater treatment facility that's also located on the site. The residual material or the sludge was disposed in a sunlight pit for a period of years.

They hired a contractor, who has spent since 1985 -- is that right, Vince? -- since 1985 evaluating contaminants in the sludge and contaminants in the groundwater and based on the results of that investigation, it's been determined that the sludge contains certain metals, certain petroleum hydrocarbons, other volatile organic compounds, semivolatile organic compounds, and all of those contaminants will be dealt with in this remedial operation; in other words, the contaminant will be dealt -- treated in some way, shape, or form and the risk posed by the contamination from the sludge pit and from the groundwater will be reduced to levels that will not be harmful to public health or the environment.

I mentioned the groundwater. It's contaminated as well and the source of that contamination has been identified primarily as the sludge pit. There are two aquifers in the area below the sludge pit, and I have put actually this overhead up to distinguish what we know to be or what we presume to be the extent of the soil contamination around the sludge pit, and we have also or the Union Pacific Railroad contractors also did that for the groundwater contamination. Again, this is the sludge pit here (indicating) and the dashed line, dotted area (indicating) is the extent of the groundwater contamination.

And what we are finding and what's been found is that the surface of the upper aquifer has around a two-inch bit of oily film of petroleum hydrocarbon that migrated down through the soils to the surface of the water table from the sludge pit, and there are other contaminants in that liquid film as well as in the groundwater, and because we are not sure, nor has there been sufficient information obtained to date to contribute that contamination entirely to Union Pacific

Railroad's operations at this site, they will be doing some additional groundwater sampling and analyses, and they will also be doing some soil sampling and analyses to determine what background concentrations are at this -- well, in this area.

Just really quickly, too, because it's hard to visualize a flat surface, these are cross sections of the sludge pit just -- what I want you to take away from this overhead is this material and this material is the sludge. This material here is a sandy gravel, and it's been difficult to penetrate both because of its geologic nature and also because the contaminant has migrated down through this material (indicating), has solidified or cemented the underlying gravels.

And so part of the problem that we are having in identifying the extent of contamination on the property is that we can't necessarily drill down to the surface of the water table and get an accurate sense for what the levels of contamination might be. That's why one of the components, and I'll be getting into that when I talk about the preferred alternatives, will be to address potential contamination in this gravel by soil flushing, which is kind of a novel approach to dealing with the unexcavated but potentially contaminated soil.

I mentioned that we know there is contamination at the site both from the sludge in the soil and that the groundwater is contaminated but what I haven't discussed or what I haven't told you is that there are federal and state requirements for cleaning up contaminated materials and they range from regulations and rules that have been put into place to no rules that are in place, nothing to guide you.

With respect to the sludge in the soil, we don't have the kind of rules and regulations in place that we do for groundwater, so part of the exercise that the contractor performed for evaluation of the site was to determine what the risks were at the site to human health and to the environment and to try to establish remedial goals such that if material was going to be cleaned up, that it would eliminate or essentially eliminate or get within a range that was acceptable to the agency and to you, the general public, where the risk to you would be significantly reduced.

Those goals exist today for treatment of the sludge and the soil. However, in many cases we don't have the technology to reduce contaminant levels to the point where the residual would not cause significant impact to human health and the environment.

Additionally, we don't know what the background concentrations are of these contaminants in the area, and perhaps they may be significantly above these risk levels. So that's why the Union Pacific Railroad is going to be going back out to determine what the background concentrations are.

The agency is not in a position to say absolutely right now what the remedial goals will be for the sludge and the soil. That determine will be made once we get the information on background concentrations and we'll be better able to evaluate to what level the Union Pacific Railroad needs to clean up the site, specifically for the sludge and the soil.

With respect to the groundwater, there are promulgated federal and state standards and there are safe drinking water standards, so you as the general public, if you were going to go out and drink the water, would want to be assured that you weren't getting contaminants that were above those levels.

Right now at this particular site none of the contaminants in the groundwater exceed those levels, they are all below those levels. However, they do exceed proposed, several proposed levels and, also, because we are talking about two aquifers, the upper aquifer being the more contaminated of the two, migration down to the lower aquifer could occur and that's where your source of groundwater is in Pocatello. We want to prevent that from happening, and so, consequently, we'll be treating or the Union Pacific Railroad will be treating the groundwater to achieve levels that will stay protective and will not unduly harm you at some future point.

So I guess what I'll do now is get into the proposed alternatives, and as Bub mentioned, there are twelve that were evaluated at the site. Rather than try to go through each one individually I am going to talk about the one that the agency prefers, and it's highlighted here as No. 5. It's also in your proposed plan. And then what I'll do is I'll just sort of generally describe the differences between it and the remaining eleven alternatives.

Alternative 5 essentially would have the Union Pacific Railroad excavate sludge, contaminated sludge in soil at approximately 4,200 cubic yards of that material. It's estimated that's what could be practicably excavated. That material would then be hauled off the property and taken to a RCRA, Resource Conservation Recovery Act, facility in Utah where it will be placed. The pit will be back filled with clean material and capped with a low permeability cap.

Prior to doing that, however, we know that there is probable contamination of soil beneath the excavated material that we don't want to just leave in place and not treat, so we are proposing to put in a soil flushing unit which would essentially look like a grid of perforated pipes with holes in it, water percolated through that system and allowed to get into those swales, which would then allow it to percolate down to the surface of the groundwater, where it would be pumped and treated along with the other contaminated groundwater.

There are two groundwater treatment components that were considered for all the alternatives and the one that was selected or the one that we are proposing to have the Union Pacific implement, they have an existing oil-water separator unit onsite as well as a dissolved air flotation unit, and essentially what those two treatment processes do is remove the oily material off the surface -- from the groundwater that's extracted and then the dissolved air flotation unit allows anything else that's remaining in that groundwater to volatilize, like if there were any volatile organic compounds in it, volatilize and then the water would be sent offsite to the Pocatello publicly-owned treatment works for further treatment or whatever, and that would be an ultimate end point. And that's the alternative, the groundwater alternative that's a component of the preferred alternative.

The other one, just so I don't have to go back and describe it to you again but so you get a sense of what it was or what it is, the difference is that there would be a carbon absorption unit instead of the dissolved air flotation unit put onsite. There isn't one there yet, they have the dissolved air flotation unit. And essentially what it would do, its ability to remove to considerably lower levels volatiles and other -- well, biological contaminants in the groundwater is much better than the dissolved air flotation unit; however, we don't feel that the type of contaminant in the groundwater necessarily warrants anything in addition to the dissolved air flotation unit. So that's why we opted for preferring that groundwater treatment.

And Alternative 5, as I mentioned, the treated groundwater would be sent to the POTW, and the other, it would be recirculated back through the site or through the system, through the perforated pipes that I was mentioning and used in the soil flushing component of the treatment process. And, as I mentioned before, a low permeability cap would be placed on the site and, again, the material would be hauled off the property, using the trains to haul the material down to the Utah facility.

Okay, that's the preferred alternative.

The differences between the preferred alternative just very briefly are Alternatives 9 through

12 involve incineration of sludge and soil, whether onsite or offsite. The evaluation that the Union Pacific Railroad's contractor performed on the viability of this particular alternative didn't demonstrate to our satisfaction that what we wouldn't end up with was actually hazardous waste, when we didn't have hazardous waste necessarily to begin with. The concentration of metals and other contaminants in the residual ash would most likely be much higher than what's in existence today in the sludge itself. Also, the type of contaminants in the sludge, primarily cadmium and chromium, which are metals, may be difficult to handle. Some incinerators are not capable of handling emissions of those materials.

Alternatives 7 and 8 involve solidification of the sludge and soil, and, again, the evaluation that the contractor performed on those alternatives indicated that because of the oily nature of the sludge it would be very difficult to ensure that once solidified it would stay solidified for the duration of the fix at the site. So without being absolutely sure that we would have a successful treatment of the sludge and soil, we didn't feel that that was a preferable approach.

Alternative 6 is identical to Alternative 5; however, it would have used the carbon absorption groundwater treatment component as opposed to the DAF as

I mentioned.

Alternatives 3 and 4 are very similar to Alternatives 5 and 6 in that the sludge and soil would be excavated and hauled offsite but there would be no cap placed over the sludge pit and theoretically the excavation of the materials would proceed down to even the groundwater table if it was technically practicable, which we don't believe that it is. So we opted for Alternative 5 because it had the low permeability cap as a component, which would prevent leaching of any contaminants from the surface of the sludge pit or from the remaining soil beneath the excavated area down to recontaminate the water table.

And Alternatives 1 and 2, Alternative 1 is a no action alternative which is required under the Superfund Act. We have to use it as a baseline for evaluating all the other alternatives. It doesn't actually involve any remedial activities. The only thing that would take place is groundwater monitoring over a period of 30 years.

And Alternative 2 are institutional controls alternatives which would merely provide deed restrictions that would limit the type of land use and future groundwater use on the property and would include installation of a six-foot-high barbed wire fence or fence around the sludge pit, and if residents or businesses were to locate to the property, the alternate drinking water supply would be made available to those people.

I should mention that in Alternative 5 and in all the other alternatives institutional controls are a part of that alternative, as is dust control and air monitoring, which is, we believe, necessary during any remediation at the site. We wouldn't want to be impacting air quality unnecessarily and, therefore, there would be dust control measures put into place.

And finally, as I mentioned before, the alternate drinking water supply would be provided in all of these alternatives should residents or businesses choose to locate to the property.

Finally, I just want to let you know that the proposed plan is kind of the first official step that we take to inform you as the general public about what it is we are proposing to do at a Superfund site and to give you the opportunity to ask some questions or give us input, but that it goes much farther than just this.

I have recently completed a document that is just in draft and will go out for review, and it's the record of decision, and what it does is it takes all of the information that was produced by the Union Pacific

Railroad and their contractors and condenses it into a form that we can use and the Union Pacific can use at a later date to make determinations about how to remediate the property. But we go through a fairly sophisticated process in order to reach decisions about why we prefer one alternative over another, and these are the nine criteria that we used (indicating).

With respect to the alternative that we prefer, we have done an evaluation of these criteria and we have compared the alternative to all twelve of the others -- it's not going to fit on here -- and as you can see with respect to what we consider to be a gauge of the performance of the alternative compared to the criteria and compared to the other alternatives, Alternative 5 along with Alternative 6 rank or performs the best when we do the comparison. This information is not in the proposed plan, it's something that we have just recently completed with respect to preparing this final record of decision document.

That's really all I had. I guess what I would like to do is emphasize that if you do have any questions, if you have any concerns, this is your forum to ask us questions. It's an opportunity for you to get up and give us formal comments on what we are proposing to do at the site and it's your opportunity to review what we're suggesting is the best way to deal with contamination on the property. However, if you feel otherwise, we are looking to have your input.

I guess I should answer your question first just because I didn't mention cost at all in my presentation. This particular alternative would cost 3.8 million dollars to implement. That includes both the sludge and soil excavation, back filling, disposal, capping, and also the groundwater treatment component. The range, and there is -- it's discussed more in detail in the proposed plan, the range goes from, oh, $670,000 for the groundwater monitoring in the no action remedy up to, I don't know, 43 million or something like that for the final incineration alternative.

This one ranks pretty cheaply, I would say, among those considered, but we feel very confident that if properly implemented, the site will be cleaned up and made safe for the public in a fairly short period of time. I think we are estimating, what, four to six months total for excavation of the sludge and soil, installation of the soil flushing component and back filling and capping of the pit with groundwater treatment. We are estimating around five years and we won't know for sure if that's true until we start implementation of the treatment.

So that's it for me. Bub, did you want to --

MR. LOISELLE: Are there any questions that you may have on the technical side right now?

MR. JACKSON: I am Tim Jackson with the Idaho State Journal. I wanted to ask, it looked like Alternatives 5 and 6, one of the main differences was offsite groundwater discharge versus onsite groundwater discharge.

MS. WILLIAMSON: Right.

MR. JACKSON: Could you describe the difference between those two and how much of a difference in cost that entails and why you chose the offsite groundwater discharge instead of the onsite?

MS. WILLIAMSON: On Alternative 5 you were right, the onsite groundwater discharge would be the water that had been treated in the carbon absorption unit and going through oil-water separation would be clean enough to be used to treat or to use in the soil flushing component, so rather than using water that comes onto the property already from Batiste Springs which would be used in the other alternative, in the DAF (indicating) alternative, the circulation, recirculation of the treated groundwater under Alternative 6 would be achieved without bringing new water onto the property.

With respect to the difference in cost

associated with that, I am not so sure that that's where the increase or the considerable increase in cost arises. I think it's with the actual carbon absorption unit itself. I would have to -- let's see if we can look here on Alternative 6 -- we don't break down in this document what the costs are for each of the components, but you can see that capital costs for Alternative 5 and Alternative 6 are -- is about a $700,000 difference and O and M with respect to dealing with the carbon filters, because they have to be cleaned periodically, is kind of a gauge. I can't tell you exactly what the cost difference is.

MR. JACKSON: Can you tell us again, please, why the carbon absorption is not needed?

MS. WILLIAMSON: The type of contaminant that's being treated at the site is a nonaqueous phase liquid petroleum hydrocarbon that's on the surface of the upper aquifer, which is of the water table, and the existing oil-water separator and dissolved air flotation units are doing a sufficient job in removing contaminants like that from the wastewater onsite and theoretically they would do equally as adequate a job in treating the upper aquifer groundwater without having to go to a carbon absorption unit.

What you get with the carbon absorption unit is additional treatment of biological materials that are in the groundwater that we aren't seeing and needing treatment or this additional treatment or warranting the cost associated with this additional treatment. And, in fact, the POTW can treat any residual contamination like volatile organic compounds in their facility.

MR. JACKSON: Is any of this remediation going on right now? What has happened so far?

MS. WILLIAMSON: No, there has been no remediation at the property. There is a fence around the site so access is limited to birds and other creatures that might get onto it, but I don't think any individuals are capable of getting onto that, onto the pit itself.

MS. LARSON: Virginia Larson.

I was just wondering, has air stripping been looked into? I understood that you hadn't gotten the level of contaminants yet of the groundwater, that you didn't know quite what the level was.

MS. WILLIAMSON: Well, the type of contaminants that we are primarily interested in evaluating in greater detail in the groundwater are metal, so I am not sure that the air stripping necessarily would get at those particular contaminants. But air stripping was one of the treatment options considered by Union Pacific Railroad's contractors.

MS. LARSON: Well, air stripping does quite similar to what carbon absorption does but not the cost for replacement on your carbon and for your carbon tet and that type of thing, I didn't understand that it was the metal was the only thing you hadn't gotten the level of contamination from yet.

MS. WILLIAMSON: Right, I think in this document, I think what you probably need to see is some more detailed remedial investigation document and that at some point when the record of decision is finalized, that would give you additional information with respect to all of the options that were considered and the reasons why they were rejected. And those documents are available right now at the Pocatello Public Library.

MR. BROWN: My name is Gordon Brown.

On Page 4 of the publication that you gave us today it comments on the groundwaters and the two different aquifers that exist, and if I may read that, it says, "Groundwater beneath the sludge pit occurs in distinct water bearing zones," and you talked about the first aquifer and then the second aquifer, the upper and the lower, and it indicates that they are separated by clay layer, and then you talk about the groundwater flow direction is generally to the northwest, and the lower aquifer is very productive drinking water and goes toward the Supply Well no. 32. And then it indicates that no water supply wells in the area have been indicated as originating from the upper aquifer. Do we have a handle on what is happening with the upper aquifer, what it dumps into or what the water flow of that is in comparison to the lower aquifer?

MS. WILLIAMSON: Yes, basically -- I don't know if I have something here that -- no, that doesn't really do it.

MR. BROWN: While you are looking for that --

MS. WILLIAMSON: This doesn't actually show the Portneuf River. Basically the concern with the upper aquifer is not that it's been used, and like this states, there have been no wells identified in the upper aquifer. The primary reason for that is there is not a sufficient amount of water available for use and because the lower aquifer is so much more productive, it's the preferable aquifer. That's not to say that you couldn't put a well in the upper aquifer and use it for your drinking water. But right now it's just not being used that way.

MR. BROWN: What about contamination of surface water, though? I mean you have got the Portneuf there and on Page 5 you indicate the Swanson Road Spring and Batiste-Papoose Spring. Those springs are probably fed by the --

MS. WILLIAMSON: Right. You will notice in the one slide what we are primarily concerned with at this site is the nonaqueous phase liquid contaminant that's on the surface of the upper aquifer. To date this (indicating) is the extent of the contamination of the upper aquifer attributed to the Union Pacific Railroad site. It's migrating but it's not migrating offsite and it's not making its way -- it may be making its way, but it's becoming diluted, it's not showing up downstream. So this contaminant is not being seen in the Portneuf River, we are not seeing it at Batiste Springs or Swanson Creek, as you mentioned -- what's the name of it? -- Swanson Road Spring, and we are not actually seeing it in the lower aquifer. It's laying on the surface of the upper aquifer.

MR. BROWN: The percolating system that you are talking about putting in, is that located above the upper aquifer or is that below the lower aquifer?

MS. WILLIAMSON: It would be located above the upper aquifer and basically because right now the sense is that because we can't drill and get the type of consistent samples we need to confirm the contamination of this gravel material beneath -- this is the silt and then this sludge here and then fill on top, that we would be -- or the Union Pacific Railroad, whoever they hire to implement the remedy, would probably only be able to excavate roughly 4,200 cubic yards of sludge and soil. And that once you got to this gravel layer (indicating), which was difficult to excavate, technically difficult to excavate, you would then locate the soil flushing system, which is the perforated pipe, and then put water through that system, which is sort of a passive system, and allow that to percolate down through this gravel to the surface of the water table, which is the upper aquifer.

MR. BROWN: And then treat it and then pump it out and transport it to --

MS. WILLIAMSON: To the POTW in our preferred alternative but in the carbon absorption alternative it would be recirculated through the system and used in the soil flushing.

MR. BROWN: How thick is the clay layer between the upper and the lower aquifer?

MS. WILLIAMSON: I don't know. It's not consistent, it's not a consistent unit across.

MR. LASCKO: Directly under the sludge pit at least 10 feet, and sometimes 15 or 20 feet thick.

MR. BROWN: The last question, I fail to understand on the alternatives why when you look at the proposed sheet that you had that shows all of the alternatives, on No. 3 the only difference that I can see between No. 3 and No. 5 is the permeability cap; is that correct?

MS. WILLIAMSON: Right, no, it's not, and I mentioned in my discussion and it's discussed in a little bit more detail on Page 8 under that particular alternative that what the Union Pacific proposed to do in that alternative was to excavate literally to the surface of the groundwater -- or to the surface of the water table if that was at all possible. So rather than setting a limit at 4,200 cubic yards, they would go down until they couldn't go down anymore. But, like I think I mentioned, we feel that it's probably not going to be technically practicable to excavate a lot of the gravely material beneath the sludge and soil.

MR. LOISELLE: Any other questions of Ann?

(No response.)

MR. LOISELLE: What I would like to suggest is we take a five or ten minute break and then we will come back and any of you folks that wish to give a presentation or provide public comments regarding Ann's proposal or in general the proposed plan for the UPRR site, we will get down with that. Thank you.

(Short recess.)

MR. LOISELLE: I guess I would like to go back on the record now and open the remainder of this public meeting up to any public comment, so any of you who wish to give testimony or whatever, please feel free to do so. My only request is that you come up to the lectern and speak clearly so that we can get it recorded and have a clean transcript.

So anybody that wishes to give public testimony, please do so at this time. The audience is limited enough that I don't have to have a sign-up sheet and then call on everybody, so don't be embarrassed, feel free, let's rock and roll here. And I'll even shut up for at least five minutes in case there is some nervous butterflies or whatnot and people are trying to work up their courage, but after about five minutes or so, if nobody shows up, I will feel free to kind of call an end to the official public meeting and then we can discuss whatever other issues that you folks want to kick around. Is that acceptable to everybody?

(No response.)

(Pause in the proceedings.)

MR. LOISELLE: If there are no individuals that wish to give comment at this time or give testimony, then I would like to terminate the official public meeting at about I guess it's 8:15 on today's date, June 18, 1991, and we'll stick around a while after this meeting to answer and address any questions or anything like that.

So I want to thank all of you for coming out and participating, and those of you who are on the mailing list will be receiving information in the future regarding this Union Pacific Railroad site.

Again thank you very much.

(Hearing adjourned at 8:17 p.m.)

* * * * *

REPORTER'S CERTIFICATE

STATE OF IDAHO)
 ss
County of Bannock)

I, PAUL D. BUCHANAN, CSR, DO HEREBY CERTIFY that I reported in stenotype the evidence and proceedings adduced in the above and foregoing cause, and that I thereafter transcribed said stenotype notes into longhand typewriting, and that the within and foregoing constitutes and is a full, true, and correct copy of the transcript consisting of Pages One through Thirty, inclusive.

IN WITNESS WHEREOF, I have hereunto set my hand this, the 25th day of June, 1991.

PAUL D. BUCHANAN, CSR and
Notary Public, in and for
the State of Idaho

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

ADMINISTRATIVE RECORD INDEX

for

UNION PACIFIC RAILROAD SLUDGE PIT SUPERFUND SITE

Pocatello, Idaho

June 28, 1991

UNION PACIFIC ADMINISTRATIVE RECORD INDEX

HEADING: 1. 0. . SITE IDENTIFICATION

SUB-HEAD: 1. 1. . Background

1. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 12/01/80 PAGES: 2
AUTHOR: R. C. FUENTES/EPA
ADDRESSEE: FILE/EPA
DESCRIPTION: POTENTIAL HAZARDOUS WASTE SITE LOG FOR SITE #810. INCLUDES MAP SHOWING LOCATION OF SITE

1. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 01/01/01 PAGES: 1
AUTHOR: /
ADDRESSEE: /
DESCRIPTION: BRIEF SUMMARY OF HAZARDOUS WASTE HISTORY OF UNION PACIFIC RAILROAD, POCATELLO SITE

SUB-HEAD: 1. 2. . Notification/Site Inspection Reportrs

1. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 02/09/83 PAGES: 3
AUTHOR: RICH FULLNER/EPA
ADDRESSEE: FILE/EPA
DESCRIPTION: FILE REVIEW CHECKLIST AND WASTE INFORMATION ABOUT UNION PACIFIC RAILROAD, POCATELLO

SUB-HEAD: 1. 3. . Preliminary Assessment (PA) Report

1. 3. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 12/27/79 PAGES: 4
AUTHOR: HOWARD BURKHARDT/EPA
ADDRESSEE: FILE/EPA
DESCRIPTION: POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION AND PRELIMINARY ASSESSMENT FORM ON UNION PACIFIC RAILROAD, POCATELLO

1. 3. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 12/01/82 PAGES: 3
AUTHOR: /EPA
ADDRESSEE: FILE/EPA
DESCRIPTION: POTENTIAL HAZARDOUS WASTE SITE IDENTIFICATION & PRELIMINARY ASSESSMENT FORM ON UNION PACIFIC RAILROAD, POCATELLO. WITH TENATIVE DISPOSITION FORM DATED 04/30/80 ATTACHED

SUB-HEAD: 1. 4. . Site Investigation (SI) Report

1. 4. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 12/27/79 PAGES: 11
AUTHOR: HOWARD BURKHARDT/EPA
ADDRESSEE: FILE/EPA
DESCRIPTION: POTENTIAL HAZARDOUS WASTE SITE, SITE INSPECTION REPORT ON UNION PACIFIC RAILROAD, POCATELLO, INCLUDES SURFACE IMPOUNDMENTS SITE INSPECTION REPORT

1. 4. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 07/25/83 PAGES: 7
AUTHOR: RON MOCZYGEMBA/EPA
ADDRESSEE: GEORGE HOFER/EPA
DESCRIPTION: MEMORANDUM: REFERENCE RCRA COMPLIANCE INSPECTION OF UNION PACIFIC RAILROAD, POCATELLO. INCLUDES FACT SHEET ON UNION PACIFIC RAILROAD FACILITY AND LETTER FROM IDAHO STATE DEPARTMENT OF HEALTH & WELFARE

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HEADING: 2. 0. . REMOVAL RESPONSE

SUB-HEAD: 2. 1. . Correspondence

2. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 11/22/88 PAGES: 2
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: STEVE R. HILL/IDAHO DEPARTMENT OF HEALTH & WELFARE
DESCRIPTION: DISPOSAL OF BARRELS, ORIGINALLY SOLD TO WILLIAM SCRAP METAL ON 04/25/86

2. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 11/28/89 PAGES: 2
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: STEVE R. HILL/IDAHO DEPARTMENT OF HEALTH & WELFARE
DESCRIPTION: DISPOSAL OF BARRELS FROM UNION PACIFIC RAILROAD, POCATELLO SITE. COVER LETTER FOR HEALTH AND SAFETY PLAN

2. 1. . - 0003 Microfilm Reel Frame Begins Ends
DATE: 01/12/89 PAGES: 15
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: STEVE R. HILL/IDAHO DEPARTMENT OF HEALTH & WELFARE
DESCRIPTION: STATUS REPORT ON DRUMS FROM UNION PACIFIC RAILROAD, POCATELLO SITE. INCLUDES LETTER FROM USPCI, INC. AND WASTE MANIFESTS

SUB-HEAD: 2. 2. . Reports/Data

2. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 10/18/88 PAGES: 15
AUTHOR: BOB KENNEDY & P. H. GOVER/HYDROCARBON RECYCLERS, INC.
ADDRESSEE: /
DESCRIPTION: WASTE SAMPLE ANALYSIS

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HEADING: 3. 0. . PHASE I INVESTIGATION (NON-CERCLA)

SUB-HEAD: 3. 1. . Correspondence

3. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 09/04/84 PAGES: 2
AUTHOR: BRADLEY D. HARR/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: A. D. WILLIAMS/UNION PACIFIC RAILROAD
DESCRIPTION: REPLY TO UNION PACIFIC RAILROAD'S REQUEST TO CAP THE POCATELLO SITE, PROVIDING DATA, WHY CAPPING IS NOT RECOMMENDED

3. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 10/03/85 PAGES: 1
AUTHOR: S. J. MC LAUGHLIN/UNION PACIFIC RAILROAD
ADDRESSEE: NEIL E. THOMPSON/EPA
DESCRIPTION: LETTER: TRANSMITTAL OF WORK PLAN FOR PHASE I

3. 1. . - 0003 Microfilm Reel Frame Begins Ends
DATE: 12/01/86 PAGES: 2
AUTHOR: S. J. MC LAUGHLIN/UNION PACIFIC RAILROAD
ADDRESSEE: NEIL E. THOMPSON/EPA
DESCRIPTION: LETTER: TRANSMITTAL OF PHASE I INVESTIGATION

3. 1. . - 0004 Microfilm Reel Frame Begins Ends
DATE: 01/22/88 PAGES: 1
AUTHOR: TED WALL/EPA
ADDRESSEE: BILL SCHMIDT/EPA
DESCRIPTION: REQUESTING QUALITY ASSURANCE REVIEW ON DATA DEVELOPED BY UNION PACIFIC RAILROAD FOR THE PHASE I INVESTIGATION REPORT

3. 1. . - 0005 Microfilm Reel Frame Begins Ends
DATE: 03/01/88 PAGES: 3
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: POCATELLO SLUDGE PIT - MATERIALS DUMPED, LOCATION, AND POSSIBLE OTHER USERS

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3. 1. . - 0006 Microfilm Reel Frame Begins 1 Ends 1
DATE: 03/24/88 PAGES: 2
AUTHOR: RALEIGH FARLOW/EPA
ADDRESSEE: DAVID FRANK/EPA
DESCRIPTION: MEMORANDUM: REVIEW OF POCATELLO SLUDGE PIT INVESTIGATION REPORT

3. 1. . - 0007 Microfilm Reel Frame Begins Ends
DATE: 03/28/88 PAGES: 5
AUTHOR: ENVIRONMENTAL SERVICES DIVISION TEAM/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: MEMORANDUM: REVIEW OF PHASE I INVESTIGATION REPORT. INCLUDES 2 MAPS OF UPPER & LOWER AQUIFERS

3. 1. . - 0008 Microfilm Reel Frame Begins Ends
DATE: 04/14/88 PAGES: 8
AUTHOR: RICH REED/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: DEAN NYGARD/IDAHO DEPARTMENT OF HEALTH & WELFARE
DESCRIPTION: MEMORANDUM: REVIEW OF PHASE I INVESTIGATION REPORT. INCLUDES ASSORETED ACQUIFER MAPS

3. 1. . - 0009 Microfilm Reel Frame Begins Ends
DATE: 06/27/88 PAGES: 2
AUTHOR: DAVID FRANK/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: MEMORANDUM: EVALUATION OF UNION PACIFIC RAILROAD'S REMEDIAL INVESTIGATION ANALYTICAL METHODS

3. 1. . - 0010 Microfilm Reel Frame Begins Ends
DATE: 12/18/88 PAGES: 1
AUTHOR: LEIGH WOODRUFF/HEAS
ADDRESSEE: JERRY MUTH/EPA
DESCRIPTION: RECORD OF TELEPHONE CONVERSATION CONCERNING TESTING NON-TARGET LIST COMPOUNDS

3. 1. . - 0011 Microfilm Reel Frame Begins Ends
DATE: 01/04/89 PAGES: 2
AUTHOR: ROBERT WILKOSZ/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: ELIZABETH WADDELL/EPA
DESCRIPTION: LETTER: REVIEW OF THE PHASE I INVESTIGATION REPORT AND THE PROJECT'S RELATION TO IDAHO'S AIR QUALITY REGULATIONS

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3. 1. . - 0012 Microfilm Reel Frame Begins 1 Ends 1
DATE: 01/06/89 PAGES: 1
AUTHOR: TED WALL/EPA
ADDRESSEE: ELIZABETH WADDELL/EPA
DESCRIPTION: MEMORANDUM: REVIEW OF THE PHASE I INVESTIGATION REPORT AND THE UNLIKELY OCCURRENCE OF AIR QUALITY BEING EFFECTED BY SIMPLE SOIL & SLUDGE DISTURBANCE

SUB-HEAD: 3. 2. . Sampling and Analysis Plan

3. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 01/01/01 PAGES: 4
AUTHOR: /APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /
DESCRIPTION: SCOPE OF SERVICES, PHASE I INVESTIGATION

SUB-HEAD: 3. 3. . Proposed Plan

3. 3. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 11/01/86 PAGES: 32
AUTHOR: /APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: REPORT: PROPOSAL FOR RI/FS FOR THE UNION PACIFIC RAILROAD, POCATELLO, SITE

SUB-HEAD: 3. 4. . Phase I Investigation Report

3. 4. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 11/01/86 PAGES: 311
AUTHOR: VINCENT LASCKO & MACKEY SMITH/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: REPORT: PHASE I INVESTIGATION, POCATELLO SLUDGE PIT

SUB-HEAD: 3. 5. . Soil Contamination Assessment

3. 5. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 08/04/89 PAGES: 31
AUTHOR: ALAN D. CAREY, VINCENT LASCKO/APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: SOIL CONTAMINATION ASSESSMENT FORMER BARREL STORAGE AREA UNION PACIFIC RAILROAD POCATELLO, IDAHO

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HEADING: 4. 0. . REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI/FS) PHASE II

SUB-HEAD: 4. 1. . Correspondence

4. 1. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 04/21/88 PAGES: 1
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: CHARLES FINDLEY/EPA
DESCRIPTION: LETTER: TRANSMITTAL OF DRAFT WORK PLAN FOR THE RI/FS, DRAFT CONSENT AGREEMENT, AND A PROPOSED SCHEDULE OF WORK COMPLETION

4. 1. . - 0002 Microfilm Reel Frame Begins 1 Ends 1
DATE: 05/04/88 PAGES: 5
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: COMMENTS ON DRAFT WORK PLAN FOR THE UNION PACIFIC RAILROAD, POCATELLO SITE RI/FS

4. 1. . - 0003 Microfilm Reel Frame Begins Ends
DATE: 05/27/88 PAGES: 4
AUTHOR: VINCENT LASCKO/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: ROBERT MARKWORK/UNION PACIFIC RAILROAD
DESCRIPTION: MEMORANDUM: RECORD OF TELEPHONE CONFERENCE CONVERSATION, 04/27/88, BETWEEN UNION PACIFIC RAILROAD, APPLIED GEOTECHNOLOGY, INC., STATE OF IDAHO, AND EPA

4. 1. . - 0004 Microfilm Reel Frame Begins Ends
DATE: 07/11/88 PAGES: 2
AUTHOR: DAN DAVOLIL/EPA
ADDRESSEE: DAVE FRANK/EPA
DESCRIPTION: MEMORANDUM: SUMMARY OF COMMENTS ON UNION PACIFIC RAILROAD'S WORK PLAN FOR PHASE II

4. 1. . - 0005 Microfilm Reel Frame Begins Ends
DATE: 07/12/88 PAGES: 1
AUTHOR: DEDE MONTGOMERY/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: MEMORANDUM: REVIEW OF UNION PACIFIC RAILROAD'S HEALTH & SAFETY PLAN FOR PHASE II OF THE RI/FS

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4. 1. . - 0006 Microfilm Reel Frame Begins Ends
DATE: 07/15/88 PAGES: 6
AUTHOR: ENVIRONMENTAL SERVICES DIVISION TEAM/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: MEMORANDUM: REVIEW OF UNION PACIFIC RAILROAD'S WORK PLAN FOR PHASE II OF THE RI/FS

4. 1. . - 0007 Microfilm Reel Frame Begins Ends
DATE: 07/18/88 PAGES: 7
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: TRANSMITTAL OF COMMENTS ADDRESSING EPA AND IDHW CONCERNS REGARDING UNION PACIFIC RAILROAD'S POCATELLO REMEDIAL

4. 1. . - 0008 Microfilm Reel Frame Begins Ends
DATE: 08/02/88 PAGES: 9
AUTHOR: VINCENT LASCKO/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: R. C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: PROJECT WORK PLAN REVIEW FOR PHASE II OF THE RI/FS. MODIFICATIONS TO RESOLVE ISSUES WITH EPA AND IDHW

4. 1. . - 0009 Microfilm Reel Frame Begins Ends
DATE: 08/05/88 PAGES: 3
AUTHOR: DEAN J. NYGARD/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE. TED WALL/EPA
DESCRIPTION: LETTER: TRANSMITTAL OF COMMENTS BY IDAHO STATE ON UNION PACIFIC RAILROAD'S RI/FS WORK PLAN

4. 1. . - 0010 Microfilm Reel Frame Begins Ends
DATE: 08/19/88 PAGES: 6
AUTHOR: ENVIRONMENTAL SERVICES DIVISION TEAM/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: REVIEW OF UNION PACIFIC RAILROAD'S WORK PLAN, DRAFT TWO

4. 1. . - 0011 Microfilm Reel Frame Begins Ends
DATE: 08/24/88 PAGES: 6
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: REVIEW OF UNION PACIFIC RAILROAD'S WORK PLAN, DRAFT TWO

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4. 1. . - 0012 Microfilm Reel Frame Begins Ends
DATE: 09/07/88 PAGES: 3
AUTHOR: VINCENT LASCKO/APPLIED GEOTECHNOLOGIES, INC.
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: TRANSMITTAL OF FINAL PROJECT WORK PLAN FOR PHASE II OF THE RI/FS

4. 1. . - 0013 Microfilm Reel Frame Begins Ends
DATE: 11/02/88 PAGES: 3
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: OUTLINING TOPICS OF DISCUSSION FOR UPCOMING STATUS REPORT MEETING. INCLUDES RI/FS WORK PLAN DEVELOPMENT SCHEDULE

4. 1. . - 0014 Microfilm Reel Frame Begins Ends
DATE: 12/16/88 PAGES: 2
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: DISCUSSION OF WHICH DATE EPA RECOGNIZES FOR APPROVAL OF THE WORK PLAN

4. 1. . - 0015 Microfilm Reel Frame Begins Ends
DATE: 12/27/88 PAGES: 18
AUTHOR: STEEVE D. HIGH & NANCY R. JACKSON/KENNEDY/JENKS/CHILTON
ADDRESSEE: VINCE LASCKO/APPLIED GEOTECHNOLOGY, INC.
DESCRIPTION: LETTER: EVALUATION OF ATMOSPHERIC FATE CONSIDERATIONS AT THE POCATELLO SLUDGE PIT, UNION PACIFIC RAILROAD

4. 1. . - 0016 Microfilm Reel Frame Begins Ends
DATE: 01/03/89 PAGES: 1
AUTHOR: VINCENT LASCKO/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: TRANSMITTAL - RISK ASSESSMENT DELIVERABLES FOR THE UNION PACIFIC RAILROAD RI/FS

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4. 1. . - 0017 Microfilm Reel Frame Begins Ends
DATE: 01/03/89 PAGES: 1
AUTHOR: STEVE ROY/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: MEMORANDUM: PRELIMINARY ARAR'S FOR UNION PACIFIC RAILROAD'S POCATELLO SITE

4. 1. . - 0018 Microfilm Reel Frame Begins Ends
DATE: 01/05/89 PAGES: 4
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: EVALUATION OF ARAR'S FOR UNION PACIFIC RAILROAD'S POCATELLO SITE

4. 1. . - 0019 Microfilm Reel Frame Begins Ends
DATE: 01/17/89 PAGES: 1
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: REQUESTING AN EXTENSION OF THE DUE DATE OF THE PHASE II RI REPORT FROM 01/23/89 TO 06/01/89

4. 1. . - 0020 Microfilm Reel Frame Begins Ends
DATE: 01/18/89 PAGES: 1
AUTHOR: DEAN J. NYGARD/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: IDENTIFICATION OF ACTION SPECIFIC ARAR'S FOR GROUNDWATER EXTRACTION, TREATMENT, AND INJECTION REMEDY

4. 1. . - 0021 Microfilm Reel Frame Begins Ends
DATE: 01/01/01 PAGES: 6
AUTHOR: ENVIRONMENTAL SERVICES DIVISION TEAM/EPA
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: REVIEW OF DRAFT 2 OF UNION PACIFIC RAILROAD'S WORK PLAN

4. 1. . - 0022 Microfilm Reel Frame Begins Ends
DATE: 02/03/89 PAGES: 2
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT SWANSON/MICHAUD RANCHES
DESCRIPTION: LETTER: NOTICE OF COMPOUNDS FOUND IN WELL WATER SAMPLES

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4. 1. . - 0023 Microfilm Reel Frame Begins Ends
DATE: 02/03/89 PAGES: 2
AUTHOR: TED WALL/EPA
ADDRESSEE: /MURDOCK & WALKER CONCRETE PUMPING COMPANY
DESCRIPTION: LETTER: NOTICE OF COMPOUNDS FOUND IN WELL WATER SAMPLES

4. 1. . - 0024 Microfilm Reel Frame Begins Ends
DATE: 02/03/89 PAGES: 1
AUTHOR: TED WALL/EPA
ADDRESSEE: MAURICE MURDOCK/
DESCRIPTION: LETTER: NOTICE OF COMPOUNDS FOUND IN WELL WATER SAMPLES

4. 1. . - 0025 Microfilm Reel Frame Begins Ends
DATE: 02/03/89 PAGES: 2
AUTHOR: TED WALL/EPA
ADDRESSEE: FLOYD BARKER/
DESCRIPTION: LETTER: NOTICE OF COMPOUNDS FOUND IN WELL WATER SAMPLES

4. 1. . - 0026 Microfilm Reel Frame Begins Ends
DATE: 02/03/89 PAGES: 2
AUTHOR: TED WALL/EPA
ADDRESSEE: /E. J. BARTELL COMPANY
DESCRIPTION: LETTER: NOTICE OF COMPOUNDS FOUND IN WELL WATER SAMPLES

SUB-HEAD: 4. 2. . Work Plan

4. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 09/01/88 PAGES: 95
AUTHOR: /APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /
DESCRIPTION: REPORT: PHASE II, RI/FS, WORK PLAN

4. 2. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 01/01/01 PAGES: 10
AUTHOR: /APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /
DESCRIPTION: REPORT: TECHNICAL SCOPE OF SERVICES, PHASE II, RI/FS

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SUB-HEAD: **4. 2. 1. Amendments**

4. 2. 1. - 0001 Microfilm Reel Frame Begins Ends
DATE: 05/13/88 PAGES: 7
AUTHOR: VINCENT LASCKO & MACKEY SMITH/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: TECHNICAL SCOPE OF SERVICES AND COST ESTIMATE - REVISION I - PHASE II OF THE RI/FS

4. 2. 1. - 0002 Microfilm Reel Frame Begins Ends
DATE: 09/07/88 PAGES: 2
AUTHOR: VINCENT LASCKO/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: AMENDMENTS 1 AND 2 TO FINAL PROJECT WORK PLAN FOR PHASE II OF THE RI/FS

4. 2. 1. - 0003 Microfilm Reel Frame Begins Ends
DATE: 01/17/88 PAGES: 6
AUTHOR: VINCNET LASCKO & MACKEY SMITH/APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: R. C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: WORK AMENDMENT NO. 3 TO PHASE II OF THE RI/FS

4. 2. 1. - 0004 Microfilm Reel Frame Begins Ends
DATE: 11/14/88 PAGES: 5
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: SUPPLEMENTAL INFORMATION. CHEMICAL ANALYSES - TARGET DETECTION LIMITS AND SAMPLING PROCEDURES FOR MONITORING WELL 4S FOR PHASE II OF THE RI/FS

SUB-HEAD: 4. 3. . EPA Quality Assurance Plan (For RI Split Samples)

4. 3. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 01/01/88 PAGES: 10
AUTHOR: /
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: REPORT: QUALITY ASSURANCE PLAN FOR UNION PACIFIC RAILROAD, SLUDGE PIT, PHASE II RI/FS

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SUB-HEAD: 4. 4. . Sampling and Analysis Data

4. 4. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 04/01/89 PAGES: 7
AUTHOR: /APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /
DESCRIPTION: CHEMICAL ANALYSES REPORTS EPA SPLIT SAMPLES UPRR SLUDGE PIT - APRIL 1989 AGI PROJECT NO. 14,942.002 (MICROFICHE COPIES)

SUB-HEAD: 4. 5. . RI/FS Reports

4. 5. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 08/01/90 PAGES: 488
AUTHOR: /APPLIED GEOTECHNOLOGY, INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: VOLUME I FINAL REPORT POCATELLO SLUDGE PIT NPL SITE REMEDIAL INVESTIGATION POCATELLO, IDAHO

4. 5. . - 0002 Microfilm Reel Frame Begins 1 Ends 1
DATE: 06/01/89 PAGES: 1102
AUTHOR: /APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: VOLUME II FINAL REPORT POCATELLO SLUDGE PIT NPL SITE REMEDIAL INVESTIGATION POCATELLO, IDAHO

4. 5. . - 0003 Microfilm Reel Frame Begins 1 Ends 1
DATE: 04/01/91 PAGES: 484
AUTHOR: /APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: FEASIBILITY STUDY POCATELLO SLUDGE PIT POCATELLO, IDAHO

SUB-HEAD: 4. 5. 1.

4. 5. 1. - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 06/27/91 PAGES: 44
AUTHOR: Ann Williamson/EPA
ADDRESSEE: Bob Markworth/
DESCRIPTION: Letter documenting EPA's final comments on the April 5, 1991 final Feasibility Study for UPRR, containing EPA's revision of the air pathways analysis, recalculated site risks and stating EPA's acceptance of RI/FS with these revisions

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SUB-HEAD: 4. 6. . Proposed Plan

4. 6. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 06/03/91 PAGES: 14
AUTHOR: /EPA
ADDRESSEE: /
DESCRIPTION: Superfund Fact Sheet The Proposed Plan Union Pacific Railroad Sludge Pit Pocatello, Idaho

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HEADING: 5. 0. . STATE COORDINATION

SUB-HEAD: 5. 1. . Correspondence

5. 1. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 12/31/87 PAGES: 3
AUTHOR: DEAN NYGARD/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: STATE ARAR'S FOR MC CARTHY'S/PACIFIC HIDE & FUR AND UNION PACIFIC RAILROAD

5. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 10/12/88 PAGES: 2
AUTHOR: DEAN NYGARD/IDAHO DEPARTMENT OF HEALTH & WELFARE
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: RE-EMPHASIS OF CONCERNS REGARDING THE IMPLEMENTATION OF THE RI/FS WORK PLAN AT POCATELLO

5. 1. . - 0003 Microfilm Reel Frame Begins 1 Ends 1
DATE: / / PAGES: 3
AUTHOR: Ted Wall/EPA
ADDRESSEE: Tom Green/Idaho State Historical Society
DESCRIPTION: Request for information on what impact the UPRR cleanup activities may have on the Oregon Trail cultural resource

5. 1. . - 0004 Microfilm Reel Frame Begins 1 Ends 1
DATE: 06/29/89 PAGES: 1
AUTHOR: THOMAS J. GREEN/IDAHO STATE HISTORICAL SOCIETY
ADDRESSEE: TED WALL/EPA
DESCRIPTION: NOTICE THAT OREGON TRAIL DOES NOT PARALLEL THE UNION PACIFIC RAIL LINE IN POCATELLO AS WAS INDICATED ON MAPS

SUB-HEAD: 5. 2. . State Certification of ARAR's

5. 2. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 01/04/88 PAGES: 243
AUTHOR: /STATE OF IDAHO
ADDRESSEE: /
DESCRIPTION: STATE APPLICABLE OR RELEVANT & APPROPRIATAE REQUIREMENTS (ARAR'S). INCLUDES ATTACHMENTS A (RULES & REGULATIONS FOR THE CONTROL OF AIR POLLUTION IN IDAHO), B (WASTEWATER TREATMENT REQUIREMENTS), AND C (HAZARDOUS WASTE FACILITY SITING)

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HEADING: 6. 0. . ENFORCEMENT

SUB-HEAD: 6. 1. . Correspondence

6. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 05/19/88 PAGES: 3
AUTHOR: TED WALL/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: REVISIONS TO DRAFT CONSENT AGREEMENT FOR THE RI/FS. INCLUDES A COPY OF P. 12 OF THE ORDER OF CONSENT AND A COPY OF THE RI/FS STUDY SCHEDULE

6. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 05/31/88 PAGES: 1
AUTHOR: CHARLES FINDLEY/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: TRANSMITTAL OF FINAL ORDER ON CONSENT FOR SIGNATURE

6. 1. . - 0003 Microfilm Reel Frame Begins Ends
DATE: 06/09/88 PAGES: 1
AUTHOR: COLLEEN A. LAMONT/UNION PACIFIC RAILROAD
ADDRESSEE: CHARLES FINDLEY/EPA
DESCRIPTION: LETTER: TRANSMITTAL OF SIGNED ORDER ON CONSENT

6. 1. . - 0004 Microfilm Reel Frame Begins Ends
DATE: 06/21/88 PAGES: 1
AUTHOR: CHARLES FINDLEY/EPA
ADDRESSEE: ROBERT KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: TRANSMITTAL OF FULLY CONFORMED COPY OF ADMINISTRATIVE ORDER ON CONSENT

6. 1. . - 0005 Microfilm Reel Frame Begins Ends
DATE: 04/25/88 PAGES: 4
AUTHOR: J. R. BERAN/UNION PACIFIC RAILROAD
ADDRESSEE: TED WALL/EPA
DESCRIPTION: LETTER: DRAFT CONSENT AGREEMENT ON RI/FS. INCLUDES A MEMORANDUM FROM COLLEEN LAMONT TO R. D. MARKWORTH

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SUB-HEAD: 6. 2. . Consent Order

6. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 06/09/88 PAGES: 28
AUTHOR: CHARLES E. FINDLEY/EPA
ADDRESSEE: PAUL A. CONLEY, JR./UNION PACIFIC RAILROAD
DESCRIPTION: ORDER ON CONSENT

SUB-HEAD: 6. 2. 1. Amendments

6. 2. 1. - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 05/01/89 PAGES: 3
AUTHOR: NANCY A. ROBERTS/UNION PACIFIC SYSTEM
ADDRESSEE: TED WALL/EPA
DESCRIPTION: COVER LETTER AND COPY OF FULLY EXECUTED AMENDED ADMINISTRATIVE ORDER ON CONSENT NO. 1088-01-03-106 SIGNED BY CHARLES E. FINDLEY, EPA, AND PAUL A. CONLEY, JR., UNION PACIFIC RAILROAD

SUB-HEAD: 6. 3. . Notice Letters and Responses

6. 3. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 01/08/88 PAGES: 6
AUTHOR: CHARLES E. FINDLEY/EPA
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: NOTICE OF POTENTIAL LIABILITY

6. 3. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 02/24/88 PAGES: 2
AUTHOR: CHARLES E. FINDLEY/EPA
ADDRESSEE: ROBERT C. KUHN/UNION PACIFIC RAILROAD
DESCRIPTION: LETTER: NOTICE OF POTENTIAL LIABILITY. PERMISSION TO NEGOTIATE AND TO MAKE GOOD FAITH PROPOSALS

SUB-HEAD: 6. 4. . Risk Assessments - Human Health, Environmental

6. 4. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 11/01/90 PAGES: 414
AUTHOR: /APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: HUMAN HEALTH RISK ASSESSMENT POCATELLO SLUDGE PIT POCATELLO, IDAHO

6. 4. . - 0002 Microfilm Reel Frame Begins 1 Ends 1
DATE: 11/01/90 PAGES: 427
AUTHOR: /APPLIED GEOTECHNOLOGY INC.
ADDRESSEE: /UNION PACIFIC RAILROAD
DESCRIPTION: ENVIRONMENTAL RISK ASSESSMENT POCATELLO SLUDGE PIT POCATELLO, IDAHO

SUB-HEAD: 6. 4. 1. Addendum

6. 4. 1. - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 07/26/90 PAGES: 34
AUTHOR: /ENVIRONMENTAL TOXICOLOGY INTERNATIONAL, INC.
ADDRESSEE: /EPA
DESCRIPTION: OFFSITE WELL EVALUATION HUMAN HEALTH RISK ASSESSMENT ADDENDUM POCATELLO SLUDGE PIT NPL SITE

SUB-HEAD: 6. 4. 2. Air Pathway Reassessment/Supporting Documentation

6. 4. 2. - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 03/12/91 PAGES: 14
AUTHOR: Douglas Hardesty/EPA
ADDRESSEE: Leigh Woodruff/EPA
DESCRIPTION: Memorandum regarding UPRR Superfund Site Human Health Risk Assessment Review

6. 4. 2. - 0002 Microfilm Reel Frame Begins 1 Ends 1
DATE: 03/13/91 PAGES: 3
AUTHOR: Bill Ryan/EPA
ADDRESSEE: Ann Williamson/EPA
DESCRIPTION: Memorandum concerning UPRR Pocatello Sludge Pit Air Monitoring

6. 4. 2. - 0003 Microfilm Reel Frame Begins 1 Ends 1
DATE: 03/25/91 PAGES: 5
AUTHOR: /EPA
ADDRESSEE: /
DESCRIPTION: Handwritten notes and tables concerning residential scenarios

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6. 4. 2. - 0004 Microfilm Reel Frame Begins 1 Ends 1
DATE: 03/28/91 PAGES: 3
AUTHOR: /
ADDRESSEE: /
DESCRIPTION: Three tables: Future Residential RME Chronic, Future Residential RME Cancer, Future Residential RME Subchronic

6. 4. 2. - 0005 Microfilm Reel Frame Begins 1 Ends 1
DATE: 04/11/91 PAGES: 4
AUTHOR: Leigh (Woodruff)/EPA
ADDRESSEE: Ann (Williamson)/EPA
DESCRIPTION: Handwritten note with attached recalculation of UPRR site risks

6. 4. 2. - 0006 Microfilm Reel Frame Begins 1 Ends 1
DATE: 04/24/91 PAGES: 3
AUTHOR: Leigh (Woodruff)/EPA
ADDRESSEE: Ann (Williamson)/EPA
DESCRIPTION: Handwritten note with attached recalculated site risks, including combined risks

6. 4. 2. - 0007 Microfilm Reel Frame Begins 1 Ends 1
DATE: 05/29/91 PAGES: 29
AUTHOR: Leigh Woodruff, Bill Ryan, Doug Hardesty/EPA
ADDRESSEE: Ann Williamson/EPA
DESCRIPTION: Memorandum regarding UPRR Pocatello Sludge Pit, Air Pathway Reassessment

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HEADING: 7. 0. . HEALTH ASSESSMENTS

SUB-HEAD: 7. 2. . ATSDR Health Assessments

7. 2. . - 0001 Microfilm Reel Frame Begins 1 Ends 1
DATE: 07/27/88 PAGES: 4
AUTHOR: /U. S. PUBLIC HEALTH SERVICE
ADDRESSEE: FILE/EPA
DESCRIPTION: REPORT: HEALTH ASSESSMENT FOR UNION PACIFIC RAILROAD'S POCATELLO SITE

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HEADING: 8. 0. . PUBLIC PARTICIPATION

SUB-HEAD: 8. 1. . Community Relations Plan

8. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 06/01/88 PAGES: 20
AUTHOR: TED WALL & GRECHEN SCHREIBER/EPA
ADDRESSEE: COMMUNITY OF POCATELLO, IDAHO/
DESCRIPTION: REPORT: COMMUNITY RELATIONS PLAN

SUB-HEAD: 8. 2. . Public Notice(s)

8. 2. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 04/12/88 PAGES: 1
AUTHOR: TED WALL/EPA
ADDRESSEE: GENERAL PUBLIC/
DESCRIPTION: NOTICE: ANNOUNCEMENT OF NEGOTIATIONS BETWEEN EPA AND UNION PACIFIC RAILROAD. FROM IDAHO STATE JOURNAL, 04/12/88, SECTION B-3

SUB-HEAD: 8. 3. . Fact Sheets and Press Releases

8. 3. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 08/01/88 PAGES: 1
AUTHOR: TED WALL & GRECHEN SCHMIDT/EPA
ADDRESSEE: GENERAL PUBLIC/
DESCRIPTION: FACTSHEET: INFORMATION ON FIELD WORK AT UNION PACIFIC RAILROAD'S POCATELLO SITE

8. 3. . - 0002 Microfilm Reel Frame Begins 1 Ends 1
DATE: 07/21/89 PAGES: 2
AUTHOR: /EPA
ADDRESSEE: /GENERAL PUBLIC
DESCRIPTION: UNION PACIFIC RAILROAD SUPERFUND SITE FACT SHEET REGARDING FINDINGS OF REMEDIAL INVESTIGATION

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8. 3. . - 0003 Microfilm Reel Frame Begins 1 Ends 1
DATE: 01/16/90 PAGES: 2
AUTHOR: /EPA
ADDRESSEE: /GENERAL PUBLIC
DESCRIPTION: UNION PACIFIC RAILROAD SUPERFUND SITE POCATELLO, IDAHO FACT SHEET PROVIDING UPDATED INFORMATION RELATED TO ACTIVITIES AT THE SITE

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HEADING: 9. 0. . TECHNICAL SOURCES AND GUIDANCE DOCUMENTS

SUB-HEAD: 9. 1. . EPA Headquarters Guidance

9. 1. . - 0001 Microfilm Reel Frame Begins Ends
DATE: 07/01/82 PAGES: 3
AUTHOR: /EPA
ADDRESSEE: /
DESCRIPTION: GUIDANCE: TEST METHOD 601, PURGEABLE HALOCARBONS

9. 1. . - 0002 Microfilm Reel Frame Begins Ends
DATE: 07/01/82 PAGES: 3
AUTHOR: /EPA
ADDRESSEE: /
DESCRIPTION: GUIDANCE: TEST METHOD 602, PURGEABLE AROMATICS

9. 1. . - 0003 Microfilm Reel Frame Begins Ends
DATE: 07/01/82 PAGES: 2
AUTHOR: /EPA
ADDRESSEE: /
DESCRIPTION: GUIDANCE: TEST METHOD 610, POLYNUCLEAR AROMATIC HYDROCARBONS