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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 Sixth Avenue
Seattle, Washington 98101

April 9, 1998

Reply To
Attn Of: ECL-111

**MEMORANDUM**

SUBJECT: Bunker Hill Explanation of Significant Difference (ESD)

FROM: Sean Sheldrake, RPM

TO: Distribution List

Please find the 1998 Bunker ESD attached for your information. A public meeting will be held to describe and discuss the ESD on April 30(at the regularly scheduled task force meeting).

Attachment

Distribution List for April, 1998, Bunker ESD:
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# EXPLANATION OF SIGNIFICANT DIFFERENCES FOR REVISED REMEDIAL ACTION AT THE BUNKER HILL SUPERFUND SITE SHOSHONE COUNTY, IDAHO

April, 1998

# EXPLANATION OF SIGNIFICANT DIFFERENCES FOR REVISED REMEDIAL ACTION AT THE BUNKER HILL SUPERFUND SITE SHOSHONE COUNTY, IDAHO

## I. Introduction

Site Name and Location

Bunker Hill Superfund Site, Shoshone County, Idaho

Identification of Lead and Support Agencies

The lead agency for this action is the U.S. Environmental Protection Agency (EPA). The State of Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) is the support agency.

Statutory Citation

This Explanation of Significant Differences (ESD) is prepared in accordance with Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and with procedures specified by the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 Code of Federal Regulations Section 300.435(c)(2)(i).

Need for an Explanation of Significant Differences

During the remedial design phase of cleanup, both EPA and DEQ identified revisions appropriate for the remedy identified in the Bunker Hill Mining and Metallurgical Complex Record of Decision (ROD). These revisions are necessary for several reasons. They will ensure that the remedy is cost-effective, maximizes the benefit to the environment, and is responsive to community concerns.

Administrative Record

This ESD and other relevant documents will become part of the Administrative Record (AR) pursuant to Section 300.825(a)(2) of the NCP. Copies of this ESD and the AR are available to the public at the following information repositories during business hours:

City of Kellogg Public Library
16 West Market Street
Kellogg, Idaho 83837

State of Idaho Department of Health and Welfare
Division of Environmental Quality

1410 North Hilton
Boise, Idaho 83706-1253

U.S. Environmental Protection Agency
Records Center (7th Floor)
1200 Sixth Avenue
Seattle, Washington 98101

## II. Summary of Site History, Contamination Problems, and Selected Remedy

### Site History

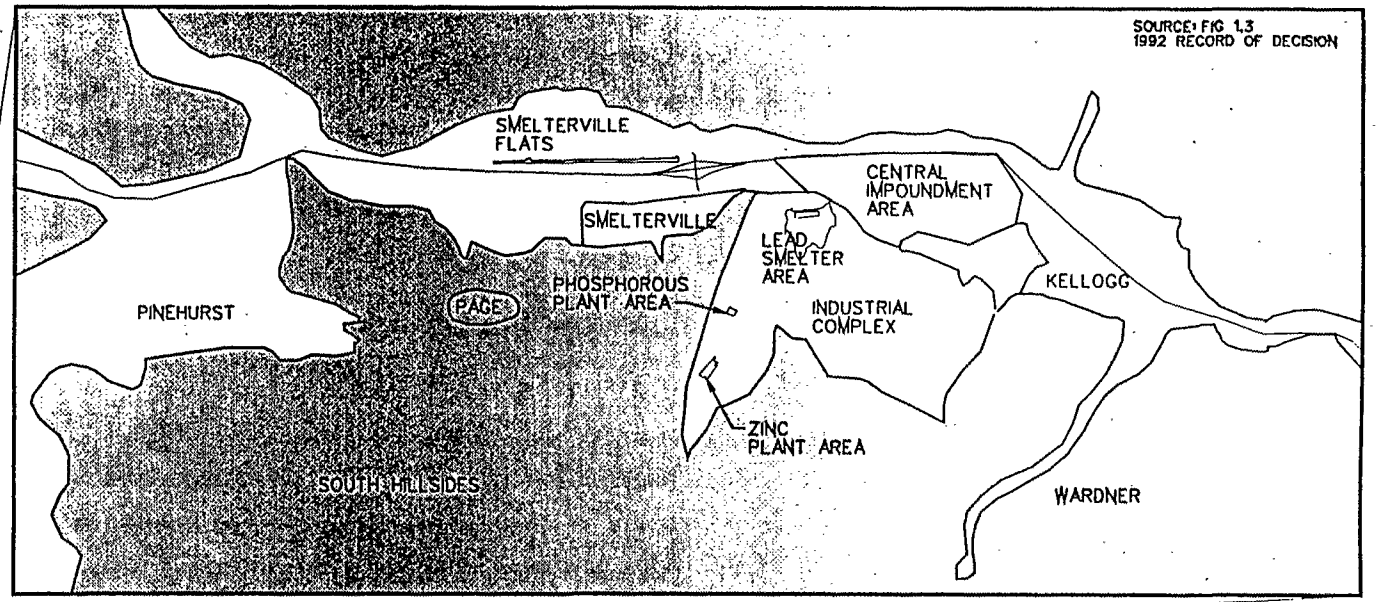
The Bunker Hill Superfund Site (site) covers 21 square miles in the Silver Valley in northern Idaho. Approximately 6,000 people live within the site boundaries, including the communities of Elizabeth Park, Page, Kellogg, Pinehurst, Smelterville, and Wardner. The site also includes the Bunker Hill Mining and Metallurgical Complex (the Bunker Hill Complex). Figure 1 shows the 21 square mile site. Figure 2 depicts the location of the site within the Coeur d'Alene Basin.

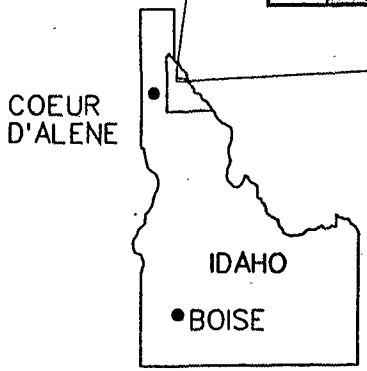
The Site is part of the Coeur d'Alene Mining District located in northern Idaho and western Montana. Mining for lead, zinc, silver, and other metals began in 1883. The first mill for processing lead and silver ores at the Bunker Hill Complex was constructed in 1886 and had a capacity of 100 tons of raw ore per day. Other mills subsequently were built at the Complex, and the milling capacity ultimately reached 2,500 tons per day.

Before the widespread use of ponds to contain milling waste products, tailings were often disposed of in local surface waters. The South Fork of the Coeur d'Alene River received tailings in this manner from numerous mines and mills in the Silver Valley in and upstream of the Bunker Hill Site. Subsequent flooding caused the tailings to be spread throughout the valley floor.

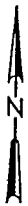
The first tailings impoundments in the Silver Valley were located at the Bunker Hill Complex. The Bunker Hill mine tailings impoundment, known as the Central Impoundment Area ("CIA"), was originally constructed in 1928. The CIA is contained in a ring dike structure built on mine waste rock and other materials, and is now 60 to 70 feet high. It is divided into three major cells, including the central impoundment pond, the gypsum pond, and the slag pile. In 1926, the 70 acre Page Pond tailings impoundment, located within the Bunker Hill Superfund Site, also began operation. It is currently closed, although a wastewater treatment plant, including four unlined lagoons and a 17 acre stabilization pond, was constructed on the pile and is operational.

From 1886 until 1917, the lead and silver concentrates produced at the Bunker Hill




VICINITY MAP

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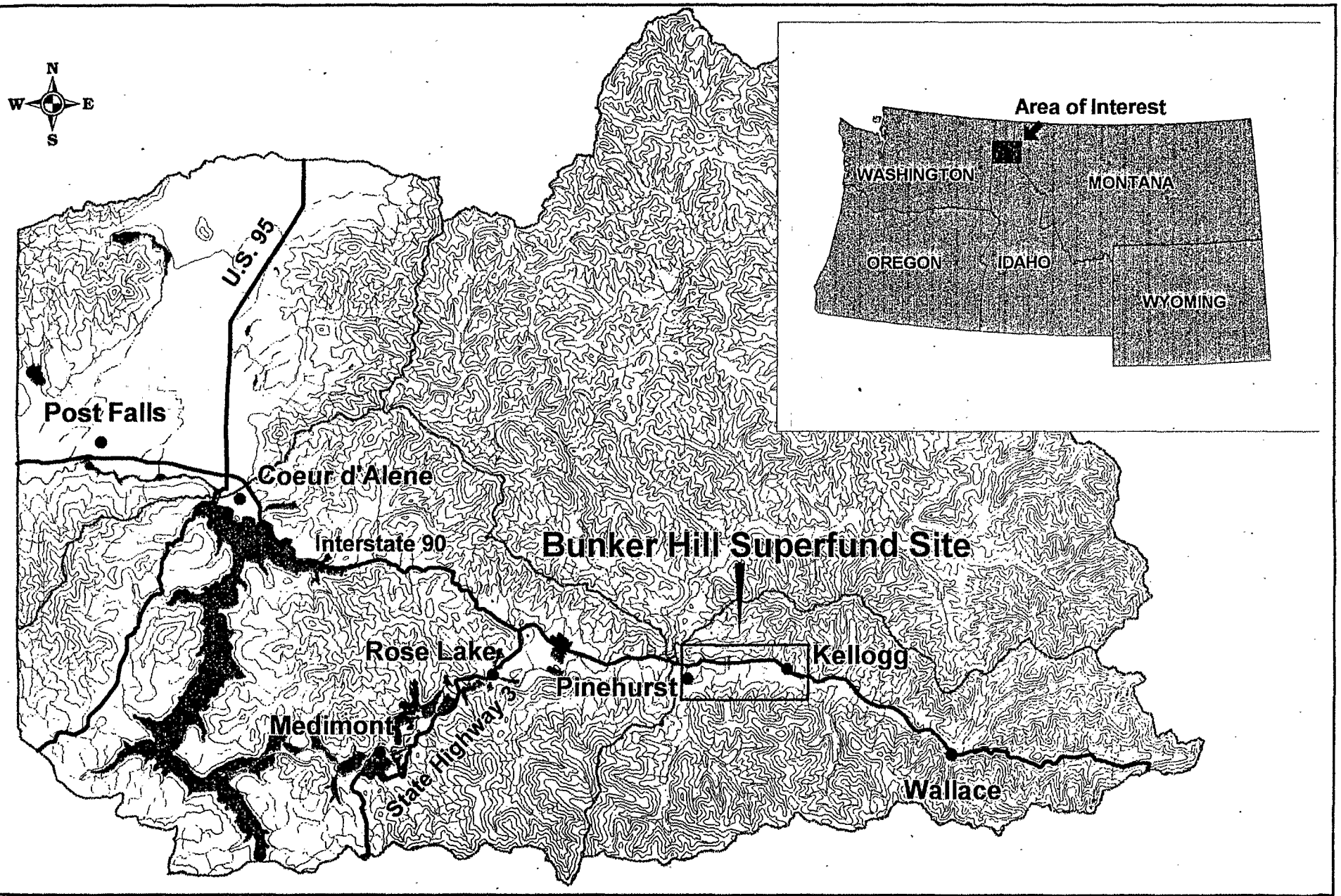
|---|---|---|---|
| **CH2MHILL**<br>*Terra Graphics*<br>SPECTRUM ENGINEERING | BUNKER HILL SUPERFUND SITE<br>U.S. ENVIRONMENTAL PROTECTION AGENCY<br>REGION 10 | SMELTERVILLE FLAT TAILINGS DESIGN REPORT<br>BUNKER HILL | FIGURE 1<br>DATE OCT 1996<br>PROJ NO. 106366.16 |

FILE NAME: 1602a001.dw 26-NOV-1996




**TerraGraphics** Environmental Engineering, Inc.

Project: Smelterville ROW's and Dust Sampling

File Name: figure1.wor Map Series: S-ville ROWs 10FEB98
Produced By: B. Bailey Requested By: R. Hibbert

- Towns
- Interstate Highways
- Major Highways
- Rivers and Streams
- Elevation Contours

Figure 2

**Site Location Map**

Complex were shipped to off site smelters for processing. Construction of the lead smelter began in 1916, and the first blast furnace went on line in 1917 producing lead, zinc, cadmium, silver, and alloys of these heavy metals. Over the years, the smelter was expanded and modified. At the time of its closure in 1981, the lead smelter had a capacity of over 300 tons of metallic lead per day. Smelting operations resulted in fugitive and stack emission of metals and sulfur dioxide which were deposited throughout the Site.

An electrolytic zinc plant was put into production at the Site in 1928. Two sulfuric acid plants were added to the zinc facilities in 1954 and 1966, and one sulfuric acid plant was added to the lead complex in 1970. When it was closed in 1981, the zinc plant's capacity was approximately 310 tons per day of cast zinc. A phosphoric acid plant was constructed at the Site in 1960 and a fertilizer plant was built in 1965. The primary products from these plants were phosphoric acid and pellet-type fertilizers of varying mixtures of nitrogen and phosphorus. The industrial complex ceased operation in 1981 except for limited mining and milling operations which resumed in 1983 through 1986, and later in 1988 until 1991, as described below.

Initially, most liquid and solid waste residues generated from operations at the Bunker Hill Complex were discharged into the South Fork of the Coeur d'Alene River and its tributaries. As a result of damming the river to impound tailings from flowing downstream, the reworking of jig tailings, and periodic flooding of the river, waste material laden with lead, zinc, cadmium, arsenic, and other heavy metals was deposited onto the valley floor. Operation and disposal practices caused deposition and redeposition of such heavy metals and other hazardous substances throughout the valley. Leaching of these deposits through the soil has contributed to heavy metal contamination of the river and groundwater.

The Site was listed on the National Priorities List pursuant to section 105 of CERCLA, 42 U.S.C. § 9605, in 1983. A remedial investigation (RI) was conducted to study the nature and extent of contamination and a feasibility study (FS) was conducted to examine alternatives for remediation. EPA, for the purposes of performing the RI/FS, divided the Site into a non-populated areas and populated areas. A RI/FS was conducted for both areas.

EPA issued a Record of Decision addressing populated areas of the site in 1991. Under the consent decree with the upstream mining group (Hecla, ASARCO, Sunshine, others), residential yards, rights-of-way and commercial properties are being remediated if they test above 1,000 parts per million (ppm) lead. Approximately 1,600 properties will need this cleanup, and over 1000 have been completed. Work is being completed at a rate of about 200 properties per year. Annual blood-lead surveys of children living at the site have shown blood lead levels decreasing from the highs recorded in the 1970's (70 $\mu$g/dl) to a level predominantly below the CDC level of concern of 10 $\mu$g/dl.

On 30 September 1992, the EPA issued a ROD for the non-populated areas of the site, which includes the Bunker Hill complex, Smelterville Flats and other areas in the flood plains,

and surrounding hillsides. EPA and the State are implementing the non-populated areas ROD. EPA issued an Explanation of Significant Differences (ESD) for the non-populated areas ROD in 1995 and amended the non-populated areas ROD in 1996.

Contamination Problems

As previously described, early mining practices allowed for mine tailings to be disposed of in the South Fork Coeur d'Alene River (SFCDR) system. This practice caused widespread contamination of the river bed. Periodic flooding thereafter spread the contaminants throughout the SFCDR floodplain and further downstream.

Air, ground water and surface water, sediments, and soils throughout the site have been contaminated by heavy metals, to varying degrees, through a combination of airborne particulate deposition, alluvial deposition of tailings and past waste disposal practices (as described above), and contaminant migration from on-site sources.

The primary contaminant of concern to human health is lead. Lead poses a serious health hazard especially for pregnant women and small children. Lead in the bloodstream can cause brain and central nervous system damage, chronic kidney and cardiovascular disorders, and impaired fetal development.

Elevated levels of arsenic and cadmium are also present in dust blown from some of the barren areas of the site. Zinc, which is a significant environmental contaminant, is also present at elevated levels throughout the site.

Selected Remedy

The following section describes the previously selected remedial actions that are modified by this ESD.

**Hillside Remedial Actions**

The 1992 non-populated areas ROD selected stabilization of hillsides and associated drainages as remedial actions due to elevated levels of metals that were eroding due to a lack of soil cover. The ROD called for:

- the revegetation of hillsides;
- contour terracing of steep slopes to control erosion and increase infiltration;
- erosion control and sedimentation retention structures;
- control of water;
- control of erosion of mine dumps;
- re-establishment of riparian habitat and stream corridor vegetation (100 foot minimum width); and

- test plots to determine what types of vegetation are best suited to the site.

These activities have all been incorporated into specific remedial actions (Arizona Mine Dump, Deadwood Gulch, Burgin Gulch and Grouse Gulch) that have taken place. These are described below.

**Milo Creek**

The 1992 ROD calls for activities in the Milo Creek drainage that minimize contact between Milo Creek surface water, and tailings and mine waste rock on the Milo Gulch floor; and that reduce contaminant transport to the South Fork of the Coeur d'Alene River (SFCDR) as suspended sediment during runoff events. Specifically, the 1992 ROD identified channelization and lining of the creek from the Wardner Water System intake to the culvert which directs stream flow beneath Wardner and Kellogg. These actions were intended to minimize contaminant transport and minimize surface water infiltration to the Bunker Hill Mine workings.

**Industrial Waste Landfills**

The 1992 ROD states that "other solid waste landfills within the Smelter Complex will be closed consistent with appropriate RCRA 40 CFR Part 264 requirements (Subpart N). A low permeability soil cover system will be constructed over the solid waste landfills located on the east side of Deadwood Gulch south of the mine/mill crusher plant in order to reduce surface infiltration through potential source materials. Capping the landfills is expected to reduce potential groundwater loadings from these sources. Upon completion of remedial activities, all disturbed areas will be revegetated or other appropriate barrier installed."

**Central Impoundment Area**

The remedial actions for the CIA required by the 1992 ROD "focus on minimizing releases from this source by installation of a cap ($10^{-6}$ cm/s conductivity or less) designed to minimize the infiltration through jig tailings and Central Treatment Plant sludges disposed of in this area."

In the responsiveness summary in the 1996 ROD Amendment concerning disposition of principal threat materials, the Coeur d'Alene Tribe requested access to the CIA for disposal of mine waste from the Coeur d' Alene Basin. In the response to comments, EPA stated that receipt of Basin wastes on the CIA was not going to occur since the area of contamination at that time only extended to the seven by three mile site boundaries.

**Well Closure**

The 1992 ROD calls for abandonment of all ground water wells within the site that are in the upper or lower zone of the main valley aquifer, or that are contaminated. Existing domestic wells designated for closure will be replaced with an alternate water supply.

**Repair of McKinley Avenue**

The 1992 ROD states "Any repairs required to community infrastructure, such as roads...due to the implementation of this ROD, will be implemented as appropriate."

**Magnet Gulch**

The 1992 ROD called for the removal of the A-1 gypsum pond and principal threat materials (including the copper dross flue dust pile, discussed in the 1996 ROD Amendment) from Magnet Gulch. Magnet Gulch is indirectly discussed as a hillsides remedial action in which "efforts will be undertaken to establish a vegetated stream corridor of 100 feet width at a minimum." Finally, Lead Smelter Closure area debris to be consolidated include, "Magnet Gulch cleanup material accumulations and contaminated soils."

**Government Gulch**

The 1992 ROD states that "contaminated soils in the vicinity of the Zinc Plant and upper Government Gulch, and material, debris, and contaminated soils from the fertilizer plant" will be consolidated in the Zinc Plant Closure (changed to the Lead Smelter Closure in the 1995 ESD).

**Smelterville Flats**

The 1992 ROD contemplated construction in the Smelterville Flats of a wetland treatment system for collection of contaminated groundwaters from the site (currently under post-ROD bench scale evaluation by the Department of Energy to determine if the sulfate reduction chemistry will work; if so, a pilot scale trial may be implemented) and removal of contaminated materials such as jig tailings, to the CIA for consolidation and capping. Contaminated materials that were to remain in the Smelterville Flats would receive a barrier that would comply with the Institutional Controls Program. In all, 500 acres in the Smelterville Flats were to be removed or capped under the 1992 ROD.

**Special Area Management Plan**

The 1992 ROD does not call for a Special Area Management Plan.

**Principal Threat Materials**

Principal Threat Materials (PTMs), as defined in the 1992 ROD are materials with

elevated levels of lead, arsenic, antimony, cadmium, lead, or mercury which produce acute symptomatic health effects in an exposed individual. The ROD (as amended in 1996) called for consolidation of PTMs (except mercury) in a fully lined cell within the Smelter Complex Closure area.

**Tall Stacks Demolition**

Demolition of the 715 foot Lead Smelter stack, the two older lead smelter stacks, and the 610 foot Zinc Plant Stack are not required by the 1992 ROD. However, decontamination of the stacks is required by the 1992 ROD.

**Zinc Plant Concentrate Handling Building and Warehouse Building**

Under the 1992 ROD (as modified by the 1995 ESD), these buildings were to be demolished and disposed of in the Smelter Closure area.

**Phosphoric Acid Fertilizer Plant Warehouse**

Under the 1992 ROD, the Warehouse was to be preserved for community uses after appropriate decontamination.

## III. Description of Significant Differences and the Basis for Those Differences

Revisions to components of the Non-Populated Area and Populated Area RODs are described below. All other requirements of the remedy are unaffected by this ESD.

**Hillside Remedial Actions**

The 1992 ROD called for vegetation of contaminated hillsides and stream corridors, including the placement of stream stabilization structures. Also, as called for in the 1992 ROD, more specific activities were selected through the remedial design. Thus, the following activities do not constitute significant changes from the 1992 ROD, but are stated here solely for the purpose of documenting the implementation of the hillside's remedy.

The following work was conducted by a potentially responsible party, the Bunker Limited Partnership (BLP), using environmental remediation funds pursuant to the BLP Chapter 11 Bankruptcy, Plan of Reorganization (No. 91-02087-K11).

- Arizona Mine Dump and Deadwood Gulch

The Arizona mine dump is located on the south end of Deadwood Gulch and represents a

substantial amount of contaminated material subject to erosion into Deadwood Gulch, Bunker Creek, and subsequently the South Fork of the Coeur d'Alene River (SFCDR). The Arizona mine dump has been partially excavated (approximately 230,000 cubic yards of material have been removed) and the floodplain of Deadwood Creek has been stabilized. These actions were taken because both the mine dump and the unstable floodplain were sources of materials which could adversely impact downstream areas. The majority of this mine dump was removed in the summer of 1997 by the BLP and the remaining material was stabilized at a combined cost of $727,515. Further work in 1998 may be necessary to stabilize the drainage (such as additional removal of mine waste and streambank/channel stabilization); if this work is deemed necessary by the Agencies, BLP will begin additional work in early 1998.

- Burgin Gulch

The floodplain of Burgin Gulch (also known as Railroad Gulch) was stabilized and erosion control features were installed in the stream channel. Burgin Gulch is located perpendicular to McKinley Avenue just west of the road closure. These actions were taken because the unstable floodplain would otherwise be a continuing source of materials which could adversely impact downstream remediated areas. The work was conducted during the 1997 construction season at a cost of $147,420.

- Grouse Gulch

Grouse Gulch is part of the area considered within the Hillsides remedial actions, described in section II, above. Grouse Gulch's hillsides are substantially denuded similar to both Government and Deadwood Gulches, creating a sediment load which is carried into the drainage, and could potentially recontaminate downstream areas. Excavation and removal of mine wastes associated with historical mining operations conducted in Grouse Gulch, maintenance of erosion and flood control features installed in Grouse Gulch, and stabilization of the Grouse Creek floodplain has been completed at an overall cost of $311,965. These actions were taken in response to community concerns for flood events and potential downstream recontamination of previously remediated residential properties.

- Deadwood Gulch

Hillsides in Deadwood Gulch also have limited soil cover. In addition to several years of tree plantings, work has occurred and is planned in this drainage to stabilize contaminated sediments. Stabilization of sediments will prevent erosion of this material and deposition in clean downstream areas such as Bunker Creek and the SFCDR. Work projected for 1998 will include stream stabilization activities such as check structures and streambank reinforcement at a cost of approximately $225,000.

In addition to work conducted by BLP, further Hillsides activities are planned to be conducted by the U.S. Army Corps of Engineers (USACE) in the summers of 1998 and 1999 which include

grass plantings and soil amendments to various denuded hillsides areas. This ongoing work does not represent a change from the ROD and is currently budgeted at $10M.

**Milo Creek**

The 1992 ROD called for creek channelization and lining of Milo Creek from the Wardner Water System intake to the culvert which directs stream flow beneath Wardner and Kellogg. Downstream of the areas called out in the ROD, a pipeline system, originally constructed in the early 1900's, conveys Milo Creek flow beneath Wardner and Kellogg. A breach of the Kellogg-Wardner pipeline system in May of 1997 caused recontamination of several remediated residential yards at levels up to 10,000 ppm lead. These elevated levels of lead were correlated to blood lead readings from children in this area which increased in 1997. The President declared Milo Creek a disaster area in June of 1997. The Federal Emergency Management Agency worked with the community to repair the immediate damage and put Milo Creek flows which had broken out onto the streets back underground. EPA worked with the mine owner, Mr. Robert Hopper of the New Bunker Hill mine, to perform immediate work to stabilize the upper Milo Creek mining areas through the winter. The State and local government agencies then began a planning effort for the construction of a permanent system for the Milo Creek watershed to be built in 1998. The 90 percent design was completed in February, 1998, and construction is scheduled to begin in April of 1998.

As required by the 1992 ROD, the areas above the Wardner/Kellogg pipeline intake are to be channelized and lined to minimize contaminant transport as well as infiltration into the Bunker Hill mine. As a significant change to the ROD, EPA has decided to participate in the funding of the Wardner/Kellogg pipeline system. These activities will mitigate the potential risk to human health posed by the recontamination of residential yards (demonstrated during 1997 flooding). The cost of ROD required work in upper Milo Creek is estimated at $1.3M. The cost of the Kellogg-Wardner work is approximately $10M, toward which EPA will contribute $700,000, representing a significant change to the ROD . Downstream work will be subject to nominal permitting and other requirements (e.g. National Environmental Policy Act, local permitting) and therefore no additional applicable, relevant, or appropriate requirements are called out in this ESD. The State of Idaho will be managing the implementation of this multi-agency funded project through the Bureau of Disaster Services and other State agencies.

**Industrial Waste Landfills**

The 1992 ROD requires that a low permeability soil cover system be constructed over the solid waste landfills located on the east side of Deadwood Gulch to reduce surface infiltration through potential source materials (See page 9-11, Non-Populated Area ROD, dated September 1992).

At the request of the community, Bunker Limited Partnership (BLP), using environmental remediation funds pursuant to the Bunker Limited Partnership, Chapter 11

Bankruptcy, Plan of Reorganization (No. 91-02087-K11), excavated the majority of landfill debris and contoured and revegetated all disturbed areas at a cost of $303,215. This significant change from the ROD was also supported by the qualitative reduction in operation and maintenance expense to the State of Idaho by consolidating these debris into the Smelter Closure and CIA Closure areas (similar to the O&M reduction achieved by combining the Lead and Zinc Plant Closure areas, documented in the 1995 ESD). It is expected that this significant change in the remedy will also enhance the protectiveness to the environment by providing a more impermeable cap for contaminants excavated from the landfills (CIA cap will be $10^{-7}$ cm/s or less permeability vs. approximately $10^{-3}$ soil cover if the landfills had been closed in place).

**Central Impoundment Area**

Under the 1992 ROD, demolition debris and contaminated materials removed from the site are disposed of in the Central Impoundment Area (CIA). It was estimated that the quantity of such materials would be adequate for closure of the CIA. However, during remedial design, it has become apparent that additional materials would be beneficial to enhance drainage off of the closure cap.

The 1992 ROD does not identify that mine wastes from the Coeur d'Alene (CdA) Basin may be disposed of in the CIA. However, EPA has determined that disposal of limited quantities of mine waste from other areas of the CdA Basin will facilitate closure of the CIA and will minimize the need to construct other mine waste disposal facilities in the CDA Basin prior to closure of the CIA. Mine waste material would include contaminated materials such as jig and flotation tailings as well as mine waste rock. Levels of lead and other contaminants in these materials would not exceed PTM criteria. EPA also developed technical and nontechnical disposal criteria for acceptance of materials, including coordination with affected communities. These disposal criteria and the inclusion of the CdA Basin in the Bunker Hill area of contamination represent a significant change from the 1992 ROD (specifically, the response to comments in the 1996 ROD Amendment).

**Repair of McKinley Avenue**

McKinley Avenue has been closed for several years (a gate was placed west of the Mine Operations Area on the Kellogg end of the road and a second gate was placed at the junction of McKinley Avenue and Government Gulch road near Smelterville by Gulf/Pintlar Corp.) in order to conduct remedial activities at the site, such as hauling contaminated material to the Lead Smelter Closure or CIA from the Gulches. When EPA took over cleanup of the site in 1994, this road closure was maintained due to locally heavy traffic on the road carrying contaminated materials and cleanups needing to occur along the roadway. To date, this type of ongoing activity has continued to make thoroughfare by community traffic impracticable. Construction related traffic may be having impacts to the roadway beyond normal wear and tear, due to the average axle weight of construction traffic.

Repair of the closed portion of McKinley Avenue that traverses the site is included in the 1992 ROD since impacts to community infrastructure from remedial activities are to be addressed in some fashion. The community expressed concern for a potential need for repairs to McKinley Avenue given the construction-related cleanup traffic currently using the roadway. In a fact sheet dated April 1996, EPA expressed its plan to include repair of McKinley Avenue in the next ESD.

In response to this concern, a pavement evaluation of the closed portion of McKinley Avenue was conducted during 1996. The evaluation concluded that the majority of pavement structure will function adequately for the next several years with anticipated construction-related traffic. In addition, annual, multi-year follow-up surveys will be conducted to monitor pavement conditions during cleanup. The 1997 evaluation has been completed and the findings are similar to the 1996 evaluation.

The initial and subsequent surveys are the foundation for determining what, if any, compensation will be paid to the City of Kellogg and/or Shoshone County for restoring the closed portion of McKinley Avenue to its existing condition prior to EPA assuming responsibility for the road closure in 1994. At this time, the estimate for EPA related (caused by EPA remedial activity) road repair to McKinley Avenue is approximately $500,000. This estimate does not include costs to be borne by the City such as bringing the road up to current standards. This decision to compensate the City of Kellogg for remedial impacts to McKinley Avenue does not represent a significant change from the ROD and is stated here as a means of documenting the Agency's decision process.

**Well Closure**

The 1992 ROD requires that all groundwater wells within the site that are in the main valley aquifer, either upper or lower zones, or other contaminated wells within the site be closed or abandoned according to State of Idaho requirements. This requirement is intended to reduce and/or eliminate human ingestion of contaminated groundwater. Also, for wells located in the lower zone aquifer, well closure is intended to mitigate the downward migration of contaminated groundwater and to preserve the lower aquifer as a future drinking water resource.

Currently, under a consent decree with the Upstream Mining Group (UMG), these wells are being closed in affected residential areas. And, although offered at no charge to homeowners, a few have refused to allow their wells to be closed. Contaminated wells (not in the main valley aquifer) that have not been closed because of owner refusal will be kept on permanent record with the Institutional Controls Program (ICP). The ICP will notify owners on a periodic basis (e.g. every two years, or as deemed appropriate by the ICP) that the well water is unsafe to drink. All residents will receive hookup to an alternate drinking water supply, thus exposure risk is not currently thought to be elevated by this significant change to the ROD. Five year reviews of the remedy will look at the overall human health protectiveness of the remedy. The cost of this significant change is incidental to the cost of the overall ICP.

Wells which may threaten the main valley lower aquifer which is a potential future drinking water source will be closed; this requirement is unchanged by the ESD.

**Magnet and Government Gulches**

The 1992 ROD required excavation of "contaminated materials" including "principal threat materials" from both Magnet and Government Gulches. In order to minimize the overall combined metals loading from the Site to the South Fork of the Coeur d'Alene River and to minimize human exposure potential to contaminated soils, excavation goals have been defined in relationship to residential exposure levels, and leachable levels of metals. For areas away from gulch drainages which will be capped by a clean soil, asphalt, gravel, or other ICP approved barrier (6 or 12 inch depth dependent on land use) to prevent human contact, the following cleanup levels/excavation goals have generally been followed:

Table 1. Upland Excavation Goals

| Contaminant | Lead | Arsenic | Zinc | Antimony | Mercury | Cadmium |
|---|---|---|---|---|---|---|
| Cleanup Goal (ppm) | 10,000 | 850 | 9,000 | 850 | 850 | 850 |

For example, levels above 10,000 ppm lead, but below PTM levels in upland areas (outside of the stream corridor) will be excavated and deposited in the Lead Smelter Closure. Non-hillside areas in the Gulches with levels below the above cleanup goals but with lead levels exceeding 1000 ppm will receive an ICP cap. For streambed areas, a separate set of analytical goals was set due to the increased likelihood of human exposure via direct contact risk in the stream or farther down river, as well as the likelihood of increased leaching from constant wetting and drying. The following cleanup levels were used as excavation goals for streambed/streambank areas:

Table 2. Streambed Excavation Goals

| Contaminant | Lead | Arsenic | Zinc | Antimony | Mercury | Cadmium |
|---|---|---|---|---|---|---|
| Cleanup Goal (ppm) | 1,000 | 850 | 1,000 | 850 | 850 | 850 |

Since the excavation goal is 1000 ppm for lead, no capping is required in streambed/streambank areas. Government and Magnet Gulch excavation costs are currently estimated to be $5.8M and $2.6M, respectively, at completion. These goals were not identified in the 1992 but do not represent significant changes from the general goals outlined in the 1992 ROD. The goals do represent a more specific set of criteria. Cleanup levels have been discussed with the community at regularly scheduled task force meetings and bi-weekly construction meetings.

**Smelterville Flats**

The 1992 ROD calls for removal and/or capping of mine waste within ~~the~~ 500 acres of the Smelterville Flats. While a 60 or more acre wetland treatment system (planned to be located in the Smelterville Flats) was being evaluated, design work for the removal of tailings in the Smelterville Flats continued. The final design, now being constructed, calls for excavation of over one million cubic yards of tailings from the floodplain of the South Fork of the Coeur d'Alene River as well as areas south of Interstate 90. This area of excavation comprises over 240 acres. Capping yet to be completed includes approximately 260 acres of property. Caps will only be placed on soils above 1,000 ppm, per the 1991 ROD. Costs of tailings removal and capping of contaminated areas is estimated at over $40M. While the wetlands have not been constructed, the removal and capping activities being performed are consistent with the intent of the 1992 ROD and represent an insignificant change. Wetlands, if constructed, will most likely be located in a different area of the site. A change in the location of the wetlands is an insignificant change from the ROD. If wetlands are not constructed, this will be addressed in a separate decision document.

In lieu of complete removal of mine waste for limited areas in the Smelterville Flats, approximately 60 acres south of the interstate (east end) were evaluated for potential diversion of precipitation from mine waste. In this area, tailings are located above the groundwater table and therefore only provide metals loading to the aquifer (and later the river) through rainfall/snowmelt events. Based on design alternatives presented, the Agency proposed to the community at public meetings and in fact sheets that a storm drain and/or ditch be constructed in this area. This will cost about $750,000. The action will divert precipitation from the tailings/mine waste (preventing wetting/drying cycles) such that metals loading is minimized. The diversion would also result in less disturbance of areas south of I-90 where heavy community development is expected to occur. Since the 1992 ROD proposes only removal and capping of tailings, the precipitation diversion represents a significant change from the original remedy. This change assumes that the area will soon be developed and paved, with surface water runoff diverted to the constructed pipeline/ditch.

**Special Area Management Plan**

The State has proposed the development of a Special Area Management Plan (SAMP) under the Clean Water Act 404 program for the Smelterville Flats. The SAMP was not included in the ROD. This SAMP would involve future Federal, State, and local agency review. Currently, all parties are involved in a collaborative planning effort to provide for environmental protection and reasonable community growth within the Smelterville Flats (Flats) reach of the SFCDR system. This effort is intended to establish a common understanding with respect to remediation of the Flats, interaction with future development, long-term floodplain function, and establishment of a streamlined permitting process for future activities.

The SAMP effort provides a long-term, comprehensive plan for maintaining remedial

stabilization and floodplain management that considers federal, state, and local interests, and would satisfy the requirements of Section 404 of the Clean Water Act. The SAMP will define permissive local development, associated permitting requirements, remedial stabilization maintenance and interaction with development, and floodplain resource protection. This will allow development interests and local governments predictability while environmental interests and agencies assurance that impacts are identified, acknowledged, and accepted as part of an overall strategy for the final Flats configuration, stabilization, and function. The SAMP does not represent an incremental cost to the Smelterville Flats cleanup and is an insignificant change to the remedy; it is included in this ESD at the request of the State.

**Principal Threat Materials**

The 1992 ROD as amended called for consolidation of PTMs in the lined cell within the Smelter Complex Closure Area. While Pintlar Corporation had control of the site in the early 1990's, approximately "...30,100 tons (18,600 CY) of zinc plant residues, sinter stockpiles cleanup, copper dross, and soil....." (CIA closure RDR, August, 1993 by MFG, page 2-11) were staged on the CIA for later disposal in the Smelter Closure. After extensive visual inspection of the CIA, which is in excess of 200 acres, these materials can not be found. -The CIA will be closed with at least a $10^{-7}$ impermeable cap (versus the original capping goal of $10^{-6}$ cm/s in the 1992 ROD). This provides a greater level of protection to contamination capped in the CIA. Accordingly, the impoundment will be closed without removing this limited amount of PTM material. This represents a significant change from the ROD. All other PTMs that have been identified have been consolidated in the PTM monocell (over 100,000 cubic yards), or stabilized as required by the 1992 ROD and 1996 ROD Amendment, as appropriate.

**Stacks Demolition**

The 1992 ROD did not require demolition of the lead smelter and zinc plant stacks (4 stacks total, 3 in the lead smelter and one at the zinc plant); it did require that the stacks be decontaminated (See page 9-6, Non-Populated Area ROD, dated September 1992). Demolition was evaluated against decontamination since it had the potential to be more cost effective than stack decontamination and maintenance. Stack demolition was subsequently selected as part of the smelter complex remedy with extensive input from the community (at task force meetings and solicitation of written comments). A fact sheet was sent out in April of 1996.

Several concerns influenced the decision to demolish the stacks. For example, all stacks ultimately had to be demolished because of predictable wear and tear of the concrete building material. Unless removed prior to Closure of the Smelter, demolition would have been more dangerous, difficult, and expensive as commercial and residential development occurred nearby the structures. In particular, with the lead smelter stack in such close proximity to the Smelter closure area, future demolition could have damaged the closure, thus potentially releasing the hazardous materials contained therein to the environment.

In addition, long-term maintenance of the stack lighting systems, as required by the U.S. Federal Aviation Administration, could have cost approximately $25,000 annually and would only escalate with time. At the time the of the evaluation, there were no known parties capable of assuming this responsibility. Alternately, stack demolition cost $75,000.

The stacks were demolished on May 26, 1996. Zinc plant debris were buried where they fell with a clean soil cover placed overtop. Debris from the lead smelter stacks were buried in the Lead Smelter closure landfill (since the stack fell directly into the closure area). This action represents a significant change from the ROD.

**Zinc Plant Concentrate Handling Building and Warehouse Building**

All aboveground Zinc Plant structures, were to be demolished per the 1992 ROD (See page 9-9, Non-Populated Area ROD, dated September 1992). However, at the request of Shoshone County, the Concentrate Handling Building and the Zinc Plant Warehouse Building were not demolished. The Agencies determined that demolition of these structures was not necessary in order to minimize leaching of metals to the SFCDR, or mitigate direct human exposure to contaminants.

These buildings will be decontaminated and preserved to be turned-over to the State of Idaho for final conveyance to Shoshone County for use as maintenance facilities. This is a significant change from the remedy which called for complete demolition of the zinc plant and represents a cost savings to the project of $330,000.

**Phosphoric Acid Fertilizer Plant Warehouse**

The fertilizer warehouse was excluded from the selected remedy (demolition) for the Phosphoric Acid Fertilizer Plant (See page 9-9, Non-Populated Area ROD, dated September 1992) due to its potential for decontamination and redevelopment. However, this building has been demolished.

Pursuant to the 1992 ROD, a search was conducted for potential purchasers of the building. After several unsuccessful attempts to market the building, the Agencies concluded that further attempts to find a developer would not be fruitful. Also, research during remedial design for Government Creek remediation revealed historical evidence that the creek should pass through where the warehouse was constructed. Lastly, roof leaks had developed over the years due to a lack of maintenance, rotting a substantial portion of the roof's structure. In 1997, snow loads combined with the rotting roof superstructure caused a portion of the roof to collapse. Collectively, these occurrences led to the conclusion that the warehouse could not be redeveloped. Instead, the warehouse was subsequently demolished in 1997 at a cost of $168,016.

IV. Support Agency Comments

IDHW/DEQ had no comments on this ESD.

## V. Affirmation of Statutory Determinations

Considering the new information that has been developed and the changes that have been made to the selected remedy, EPA and DEQ believe that the remedy remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions and treatment technologies to the maximum extent practicable for this site.

## VI. Public Participation Activities

Public comments regarding the potential for demolishing the Lead Smelter and Zinc Plant stacks were solicited early August 1995 during the Bunker Hill Task Force meeting and were also solicited in the August 1995 Fact Sheet. A public meeting was also held late August 1995 to receive comments regarding the potential for not demolishing the Lead Smelter and Zinc Plant stacks. Comments received during the public comment period are available for review at the above-mentioned information repositories. All other activities described above were discussed at regularly scheduled public task force meetings (held every other month), described in Table 3, below.

| **Table 3. Task Force Meeting Summaries** | |
|---|---|
| April 24, 1995 | Phos. Plant, Smelterville Flats, Milo Creek Updates |
| June 27, 1996 | Stack, Hillsides, and Gulches update. |
| August 15, 1996 | Smelterville Flats, Hillsides, and CIA update. |
| November 7, 1996 | Gulch, Smelterville Flats, Hillsides, and Demolition update. |
| January 30, 1997 | Demolition, Gulch, and Smelterville Flats update. |
| May 29, 1997 | Smelterville Flats, McKinley Avenue, Grouse Creek, and Milo Creek updates. |
| July 31, 1997 | Gulch and Smelterville Flats update. |
| October 2, 1997 | Gulch, CIA, and Smelterville Flats update. |
| December 4, 1997 | Gulch, Smelterville Flats, and Grouse Creek/Hillsides update. |

Activity updates were also published in fact sheets, described in Table 4, below.

| Table 4. Fact Sheet Summary | |
|---|---|
| August, 1995 | Stack demolition comments solicited, information on Phos. Plant Warehouse, and Smelterville Flats. |
| December, 1995 | Summary of stack comments, discussion of criteria necessary to save the stacks, and update on Milo Creek work. |
| April, 1996 | Notification of plans to demolish stacks, discussion of upcoming ESD to include stack demolition and McKinley Avenue Repairs. |
| July, 1996 | Recap on stack demolition, discussion of proposed buildings to 'save' for community use in the Zinc Plant, Gulch soil removal, and Smelterville Flats update. |
| January, 1997 | Gulch soil removal, CIA/Smelterville Flats, and Milo Creek update. |
| January, 1998 | Smelterville Flats, Gulch, and Milo Creek update. |

Further information on both Table 3 and Table 4 may be found in the administrative record. Once this ESD is finalized, it will be announced in the next fact sheet and task force [public] meeting.

Mike Gearheard
Associate Director, Environmental Cleanup Office
Region 10
U.S. Environmental Protection Agency

April 8, 1998
Date

Concurrence - Bunker Hill ESD#2, March, 1998

| | Sheldrake | Yackulic | Kowalski | Krueger | |
|---|---|---|---|---|---|
| Initials | SS | TY | [illegible] | CW | |
| Date | 3-19-98 | 3/31/98 | [illegible] | 4/7/98 | |