

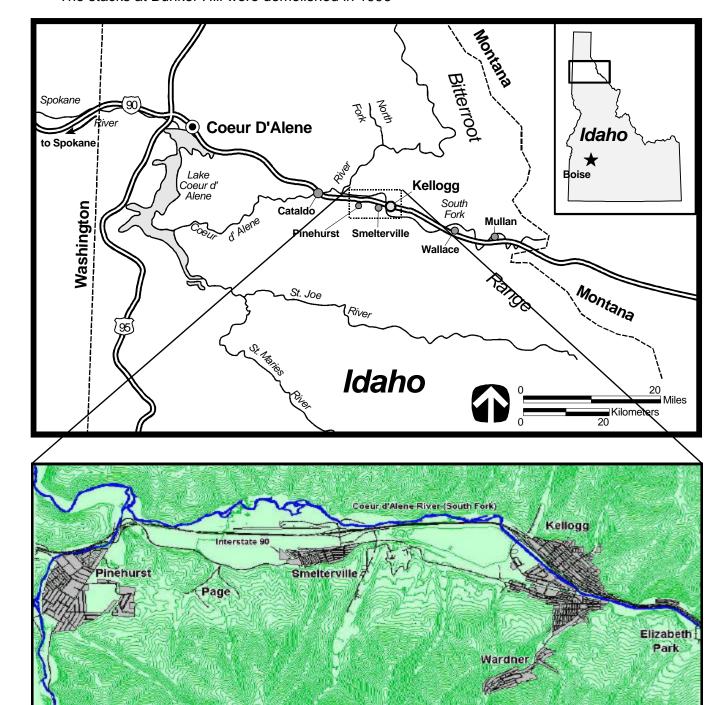


Aerial Hydroseeding of Bunker Hill Hillsides, September 1998

Bunker Hill Facts

Did You Know . . . ?

- Blood lead levels are steadily decreasing among Silver Valley children, and nearing the national average
- A total of 1.3 million cubic yards of waste have been removed from Smelterville Flats
- Over 1,400 residential yards were cleaned up by the end of 1998
- Helicopters began hydroseeding hillsides in September 1998
- The stacks at Bunker Hill were demolished in 1996.



The Bunker Hill Study Area is a former smelting facility located along I-90 in the Silver Valley in northern Idaho. It encompasses the towns of Pinehurst, Smelterville, Wardner, and Kellogg and the communities of Page, Ross Ranch, Elizabeth Park, and Montgomery Gulch.

Who's Helped with the Bunker Hill Cleanup?

- U.S. Environmental Protection Agency (EPA)
 - ĆH2M Hill (EPA's contractor)
- Idaho Department of Environmental Quality/Department of Health and Welfare (IDEQ)
 - Terragraphics Environmental Engineering (contractor)
- Bunker Hill Superfund Task Force

- Agency for Toxic Substances and Disease Registry (ATSDR)
- U.S. Army Corps of Engineers (ACOE)
 - Morrison-Knudsen (contractor)
- Panhandle Health District (PHD)
- Coeur d'Alene Tribe
- Community Leaders and Citizens

How Can You Get Involved?

This brochure gives an overview of the history, completed work, and future work for the Bunker Hill Study Area.

EPA encourages community members in the Silver Valley to become involved in the Superfund cleanup process by participating in community education and involvement activities and giving input to EPA as the cleanup continues. Some of the ways you can become involved are:

Attending Bunker Hill Task Force Meetings

In 1985, a Superfund Task Force, made up of local citizens, was established to provide a public forum to discuss the Bunker Hill cleanup project. The Task Force and other citizens have played important roles in the cleanup decision-making process. You can find announcements of upcoming activities in local newspapers, fact sheets, and meeting notices mailed to community members.

Participate in Technical Assistance Grants with PAC

EPA Technical Assistance Grants (TAGs) are awarded to citizen's groups affected by Superfund sites. These grants enable community groups to hire independent technical advisors to help them translate site-related information, participate in cleanup decisions, and share information with the community.

In the spring of 1997, EPA awarded a Technical Assistance Grant (TAG) to the Silver Valley People's Action Coalition (PAC). The PAC has been holding meetings with EPA and the community to discuss the findings of their technical advisor. To find out more about the PAC's TAG and how you can become involved, call (208) 784-8891.

Attending Local EPA Activities

In addition to the Task Force meetings, EPA occasionally holds community meetings to discuss the project. You can find out about upcoming community involvement activities through fact sheets, the newspaper, or contacting the Panhandle Health District.

Reading EPA's Fact Sheets

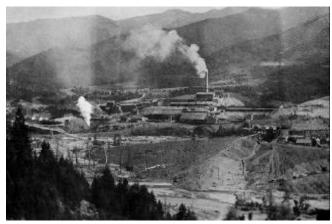
EPA writes and distributes fact sheets for community members. The fact sheets offer current information about the studies, enforcement and cleanup activities relating to the Bunker Hill Study Area.

For more information, or to be included on EPA's mailing list, call Marianne Deppman, Community Involvement Coordinator, at EPA's Seattle office at (206) 553-1237, or toll-free at 1-800-424-4372.

Bunker Hill History

History - How Was the Study Area Contaminated?

The 21-square mile Bunker Hill Study Area was contaminated by years of mining and smelting operations. Mining started in the area in the late 1800's and smelting operations followed in the early 1900's. The mines and smelters produced lead, zinc, cadmium, silver, gold, and alloys of these heavy metals. Other plants in the Bunker Hill complex produced sulfuric acid, zinc oxide, and phosphate fertilizers. Lead, arsenic, cadmium, and zinc are the main contaminants at Bunker Hill. "Tailings" are materials left over from mining and milling processes. Some mine tailings were discharged to area flood plains, some were discharged directly into the river, and others placed in holding areas (called "impoundments") that were built to prevent tailings from washing into the South Fork of the Coeur d'Alene River. As the river changed its course, the tailings from upstream moved throughout the valley floor. Past air emissions, particularly from the smelters at Bunker Hill, also contributed to widespread lead contamination. In 1973, a fire at the smelter damaged the air emissions controls and dramatically increased lead emissions from the smelter. The smelter closed in 1983.



Bunker Hill Lead Smelter, 1920's. Photo Provided Courtesy of the Kellogg Public Library

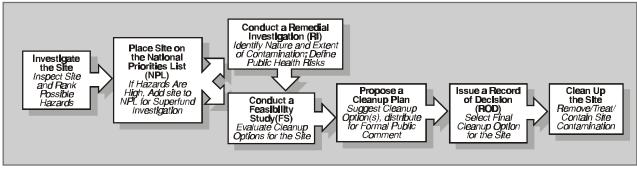
What is Superfund?

The Superfund program was established by Congress in 1980 to respond to chemical emergencies and investigate and clean up abandoned hazardous waste sites. The U.S. Environmental Protection Agency (EPA) administers the Superfund program in cooperation with individual states and tribal governments.

After a hazardous waste site has been reported, EPA screens the site to determine if action is necessary. The first step in the Superfund process is often referred to as the "Remedial Investigaton/Feasibility Study" (RI/FS), and is the process by which cleanup decisions are made. If a site poses an immediate threat to human health or the environment, or may cause such a threat in the near future, EPA will take a "removal action." Typically, these actions are taken to prevent direct human contact with contaminants, remove hazardous materials from the site, and prevent contaminants from spreading off the site.

Sites having extensive contamination are placed on EPA's National Priorities List (NPL) for further investigation and cleanup. Once a site is placed on the NPL, it is investigated to discover the nature and extent of contamination, health and environmental risks posed by the site, and options for cleaning it up. EPA then proposes cleanup options to the community and asks for public comment on all the options. Once public comments are considered, EPA selects a cleanup remedy and works toward cleaning up the site. Cleanup may involve treating, removing or containing the hazardous wastes in order to protect the people living near the site and the environment.

The Federal Superfund Process



Bunker Hill Cleanup Milestones and Decisions

Bunker Hill was added to the National Priorities List (NPL) in 1983, and EPA and the State of Idaho began investigating the nature and extent of the contamination in order to determine the type of cleanup needed. EPA and the State of Idaho divided the studies into two parts. The "Populated Area," which encompasses the residential communities, was addressed first due to the high risks to human health from lead contamination. The "Non-Populated Area" includes the smelter complex, tailings impoundments, surrounding hills, ground water, sediments and surface water, dust and adjacent commercial properties. Cleanup decisions are documented in two Records of Decision (RODs).

- In 1991, the ROD for the Populated Area was signed, covering residential yard and commercial property cleanup. In 1992, the ROD for the Non-Populated Area was signed, documenting cleanup decisions for the rest of the Bunker Hill Study Area.
- In 1994, 20 buildings in the smelter complex area were demolished.
- In 1995, the EPA and the Army Corps of Engineers (ACOE) led an emergency removal of 80 buildings at the smelter zinc plant.
- In 1996, the stacks at Bunker Hill were demolished.
- In 1997, the South Fork of the Coeur d'Alene River was diverted to perform tailings removal.
- In 1998, the removal of contaminated materials from Smelterville Flats was completed.
- In 1998, hillsides hydroseeding revegetation began.

EPA has identified 17 private companies believed to be responsible for contamination at Bunker Hill, some of whom are working in partnership with EPA and the Idaho Division of Environmental Quality (IDEQ) to perform cleanup.

Who Pays for the Bunker Hill Cleanup?

By the end of 1998, approximately \$87 million had been spent in construction costs on the Bunker Hill cleanup, primarily on the Non-Populated area where no Potentially Responsible Party (PRP) is performing cleanup. EPA estimates it will cost approximately \$58 million to clean up the remainder of the Study Area.

To date, cleanup of the Bunker Hill Study Area has been paid for by money from the EPA Superfund Trust Fund and money from companies who are liable for the contamination, known as Potentially Responsible Parties (PRPs). Under the Superfund law, EPA has the authority to make those companies and individuals responsible for contamination at a Superfund site perform and pay for the cleanup work at the site. If the responsible parties cannot be located or cannot clean up the site, EPA may use money from the Superfund Trust Fund to pay for the cleanup. This money comes mainly from taxes on the petroleum and chemical industries. Under the law, the State of Idaho is required to match 10% of Federal funds used for cleanup, and conduct and pay for all operation and maintenance (O&M) costs thereafter.

About The Institutional Controls Program (ICP)

Cleanup at the Bunker Hill Study Area involves both engineering and non-engineering controls. Nonengineering solutions are called "Institutional Controls."

The Bunker Hill Institutional Controls Plan (ICP) is a locally enforced set of regulations designed to ensure the integrity of clean soil and other protective barriers placed over contaminants left in place throughout the Bunker Hill Study Area. This program includes permitting and inspection procedures, monitoring, educational efforts, and records maintenance. It was adopted by the Panhandle Health District (PHD) as part of its Environmental Health Code in February 1995. Call the PHD at (208) 783-0707 if you are interested in a video explaining the ICP and services offered in more detail.

Bunker Hill History

What Are the Health and Environmental Effects of the Contaminants?

The metals that contaminated the Bunker Hill Study Area have both health and environmental effects.

Health Effects

Lead, arsenic, and cadmium are the contaminants of primary concern for human health at Bunker Hill. The following provides a general discussion of the health effects associated with exposure to these metals.

Lead can cause severe health impacts, particularly in small children and fetuses. The nervous system is the most sensitive target for lead poisoning. In children, neurological effects have been documented at exposure levels once thought to cause no harmful effects.

Arsenic exposure has been proven to increase a person's risk of developing cancer. Arsenic can also cause other problems such as dark or light spots on the skin, small "corns" on the palms, soles and trunk of the body, and blood and nerve disorders.

High **cadmium** levels severely damage the lungs and can cause death. Lower levels over years leads to accumulation of cadmium in the kidneys that can cause kidney disease.

Environmental Effects

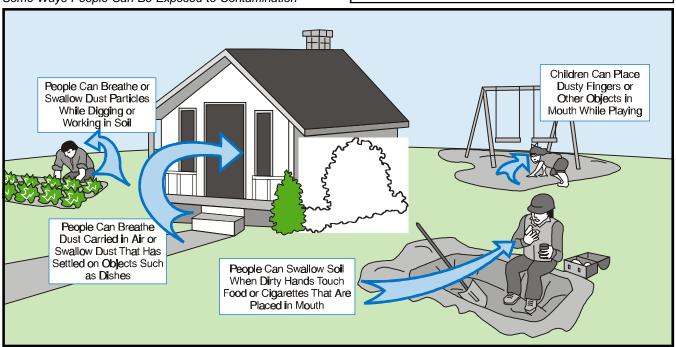
The metals have had adverse effects on the surrounding environment by contaminating soils, surface water, groundwater, and air. During the mining boom of the late 1800s and early 1900s, local timber was harvested to support the mining business. Lack of trees caused severe hillside erosion (the wearing-away of land by wind and water). The lack of soil and emissions from the industrial facility made it difficult to successfully re-grow the forest. In addition, the wind picked up contaminated soils from the barren hillsides, spreading them throughout the valley.

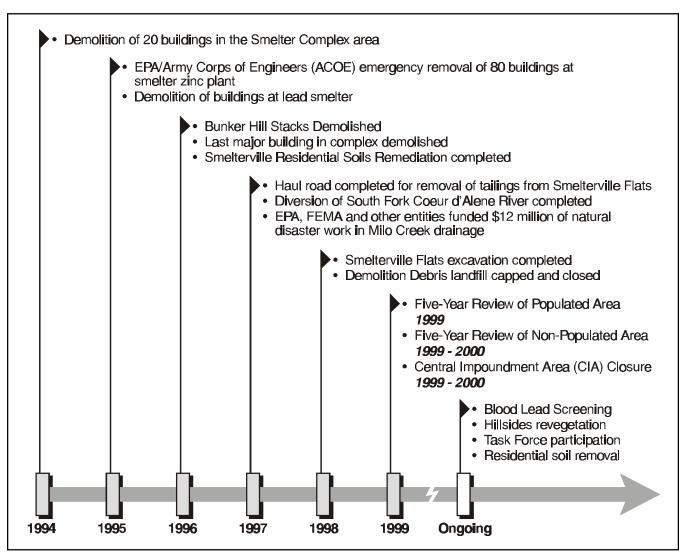
Lead Levels in Blood Decrease

For children in the Silver Valley, average blood lead levels in 1974 were above 40 µg/dl (micrograms/ deciliter), but ongoing cleanup and education activities at the Bunker Hill Study Area have resulted in the steady decrease of blood lead levels. Since 1985, the Panhandle Health District (PHD) has made regular, voluntary blood lead screening available for the children of Wardner, Page, Smelterville, Kellogg, Elizabeth Park and Ross Ranch. In 1990, blood lead screening services were made available to the community of Pinehurst.

Each year, the results of the blood lead survey are presented at the Task Force meeting. The 1998 average blood lead level was 4.8 µg/dl. The goal is to continue working toward reducing blood lead levels.

Some Ways People Can Be Exposed to Contamination





This timeline covers the major cleanup activities at Bunker Hill since 1994.

Yard Remediation Update

Under the 1994 Consent Decree between EPA, IDEQ, and the Upstream Mining Group (UMG), UMG excavates 200 contaminated residential properties per year with lead concentrations greater than 1,000 parts per million (ppm). The UMG is a group of mining companies that are PRPs, including Sunshine, Hecla and Asarco. Each year, the UMG creates a workplan including target sampling and cleanup areas. In general, each yard takes about three weeks to excavate and fill; property owners can continue to live at the residence throughout the project. The State of Idaho Department of Environmental Quality (IDEQ) oversees these residential cleanups.

By 1996, the UMG had completed cleanups for all residential yards and commercial areas in the community of Smelterville. *Major components of the 1996 Yard Remediation Project were filmed and are available on VHS videotape. If you are interested in viewing a copy, contact Jerry Cobb of the Panhandle Health District at (208) 783-0707 or see the Kellogg Public Library.*

In 1998, the UMG completed 204 yard cleanups on the north side of I-90 in Kellogg. After this area is completed, the UMG will focus its efforts on the portion of Kellogg south of I-90. By the end of 1998, EPA and the UMG had cleaned up a total of 1,402 properties in the communities of Smelterville, Pinehurst and Kellogg. The UMG performs its cleanup work under the oversight of IDEQ.

Between 1989 and 1998, the UMG and others completed the following cleanup work in the populated area:

- 1,402 residential yards and discrete areas
- 109 commercial properties
- •84 rights-of-way
- 15 wells closed

At this point, approximately 1,000 yards remain to be cleaned up. The UMG projects this work will be completed by the year 2004.



Cleanup of a yard in a Silver Valley Community.

Demolition Work Complete

Emergency Removal

In 1994, EPA Region 10 received \$5 million from EPA Headquarters in remediation funds. Using these funds, beginning in late 1994, the U.S. Army Corps of Engineers (ACOE) and their contractor demolished approximately 20 wooden buildings in the smelter complex which posed a fire hazard. Between December 1994 and July 1996, over 100 structures at the Smelter and Zinc Plant areas were demolished.

Landfill Closure

In 1998, cleanup crews capped and closed a demolition debris landfill at the site of the old lead smelter. It contains the remains of more than 200 industrial structures demolished in previous years. This work finished ahead of schedule in the fall of 1998.

Stacks Demolished

During public meetings in 1995, comments were invited regarding the demolition of the Bunker Hill stacks. This input from the community, as well as environmental impacts of all of the stacks, were major considerations in deciding whether or not to demolish them. EPA worked on estimated costs of maintenance versus demolition, and provided this information at the Bunker Hill Task Force public meeting in August 1995.

Following the public comment period, EPA and IDEQ decided to demolish all four stacks at Bunker Hill. Two of the stacks, the Smelter Stack and the Zinc Plant Stack, were over 600 feet high. The demolition occurred on May 26, 1996. Dust control measures, including watering the area surrounding the stacks and perimeter monitoring, were taken beginning one week prior to the demolition. A video of this work is available on a CD Rom produced by EPA in April 1998; contact Debra Packard at (206) 553-0247 or toll-free at

1-800-424-4372. EPA acknowledges the work of our partners in the demolition project: Local Silver Valley governments and citizens, the Superfund Task Force, the Army Corps of Engineers and contractors, the Idaho Department of Environmental Quality (IDEQ), and the Panhandle Health District (PHD).



Demolition of the Zinc Plant Stack, May 1996



What Other Work Has Been Done?

Sampling Work Ongoing

Sampling continues at the Bunker Hill Study Area. This work is an important part of the cleanup, as it is used to determine type and depth of contaminants, in order to thoroughly and safely plan for their disposal. Sampling also helps planners determine how quickly metals are released under different conditions. This helps in the design of engineering plans prioritizing tailings disposal.

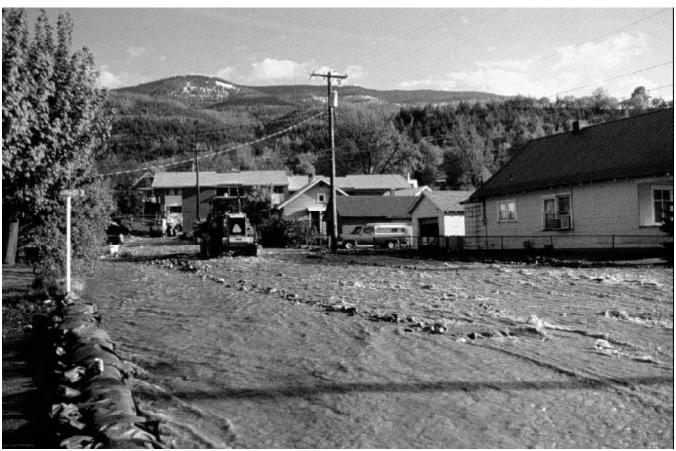
Milo Creek Flood

Milo Creek flooded in May 1997. In excess of 50 homes and approximately five miles of public rights of way were damaged and/or recontaminated with mine tailings as a result. EPA, the Federal Emergency Management Agency (FEMA), the State of Idaho and others cooperated to fund \$12 million for flood control projects, which occurred in two phases: short-term emergency construction, and a long-term permanent fix. The permanent solution was designed to stabilize the entire creek channel, from upper Milo Creek to the Coeur d'Alene River.

Gulch Cleanup Update

In 1996, Morrison-Knudsen began work on contaminated soil removal in Government Gulch. Over 500,000 cubic yards of this soil was removed from areas around the Industrial Complex and taken to the Closure Area at the former Lead Smelter for disposal. Nearly 200,000 cubic yards of clean fill and cover material were brought back into Government Gulch as part of completing the remedy.

In the summer of 1998, workers removed soils contaminated with heavy metals from several gulches and ravines within the Bunker Hill Study Area. After workers cleared these areas of buildings and contaminated soils, they brought in clean materials and re-planted the areas. Three miles of creeks, complete with grade control structures and check dams, have been reconstructed.



Oak Street, in Kellogg, during the May 1997 Milo Creek Flood.

What Other Work Has Been Done?

Smelterville Flats Excavation Complete

In September 1997 the haul road used to transport excavated tailings from Smelterville Flats, an area along the South Fork of the Coeur d'Alene River, was finished. In 1998, workers completed the excavation of contaminated materials from Smelterville Flats, a major cleanup accomplishment. Excavation took place on both the south and north sides of I-90. Contractors excavated down to four feet in most areas, and deeper in areas where contamination was found to be deeper. By September 1998, 1.3 million cubic yards of waste had been removed from the Flats. This removal project was the joint effort of EPA's contractor, CH2M Hill, the U.S. Army Corps of Engineers, and Terragraphics Environmental Engineering, the State of Idaho's Contractor. IDEQ, EPA, and ACOE inspected this cleanup afterwards to ensure the work was completed properly.

South Fork of the Coeur d'Alene River Diverted

In 1997, the diversion of the South Fork of the Coeur d'Alene River was completed, a crucial part of the removal/river reconstruction work. Re-channeling the river for winter 1998 was an important accomplishment to prevent flooding of the flats and consequent spreading of contamination, and enabled workers to remove contaminants under "dry" conditions.

The re-routing of the South Fork of the Coeur d'Alene River has created a new river course within the existing floodplain. Approximately 2½ miles of the river were reconstructed. Clean fill was added to reshape the river channel as the tailings were removed, as well as topsoil to revegetate the Flats. The contaminated tailings were permanently deposited in the Central Impoundment Area (CIA), the largest impoundment area in the Bunker Hill Study Area. Cleanup managers foresee that this project will improve fish habitat by creating more pools, meanders and in-stream structures for shade, as well as reduce further downstream damage from contaminated sediments originating from Smelterville Flats. Flats revegetation is projected to be completed in 1999.

Union Pacific Railroad/Stauffer Work

In 1995, the public was invited to comment on a Consent Decree requiring cleanup of the Union Pacific Railroad (UPRR) right-of-way within the Bunker Hill Study Area. The Consent Decree outlined responsibilities of companies in performing cleanup work. Companies included Stauffer, Rhone Poulenc, and Union Pacific. The EPA and IDEQ are also parties involved in this settlement agreement.

In 1995, the Consent Decree was finalized and UPRR began removing railroad tracks in August 1996. Before the Decree was signed, UPRR had completed lead sampling along the right-of-way and excavation of soils containing high lead levels.

The 1.5-mile long Kellogg Greenbelt area (from the old Kellogg Railroad Depot to the Gondola parking lot) is planned to be paved in the future for use as a recreational trail/multiple use area. In 1997, this area was cleaned up and covered with a gravel and soil barrier.



South Fork Coeur d'Alene River - Theatre Bridge Diversion, 1997

What Other Work Has Been Done?

Hillsides Project Update

Planting trees and other vegetation on hillsides is an important part of the cleanup at Bunker Hill. Planting reduces erosion, helps prevent contaminated sediments from moving down the hillsides into residential yards and the river, and is part of the EPA/IDEQ chosen remedy.

In September 1998, crews used helicopters and hydroseeding equipment to begin hillside revegetation. The hillsides targeted for 1998's efforts were the east and west slopes of Government Gulch and hillsides near Deadwood Gulch. Because many of the hillsides were inaccessible by land-based equipment, a Sikorski sky crane helicopter was used to apply some of the revegetation materials. In this first phase of a three-year project, approximately 200 acres were revegetated. In the spring of 1999, EPA

Helicopter Hydroseeding Bunker Hill Hillsides, Fall 1998.

plans to lime soils on other hillsides, and do more revegetation work in the fall of 1999.

Hillsides Project Background

In the late 1970's, Gulf Resources planted over one million trees which have had a 90% growth success rate. These trees are flourishing today and have greatly helped to reduce erosion.

In 1990, EPA, Pintlar Corporation, and Hecla Mining Company signed an agreement to revegetate and stabilize hillsides within the Bunker Hill Study Area. Approximately 1.75 million seedlings had been planted on Bunker Hill hillsides before EPA began its hillsides work. By December 1994, nearly a million additional trees were planted and over 50 miles of terraces constructed.

In 1995, EPA and IDEQ worked with the City of Smelterville to address hillside sloughing problems, and ordered seedlings, grasses, and shrubbery which were planted in the spring of 1996. In 1997, EPA oversaw the planting and monitoring of test plots to collect data that assisted with developing a design for full-scale revegetation.



Bunker Hill Hillsides.

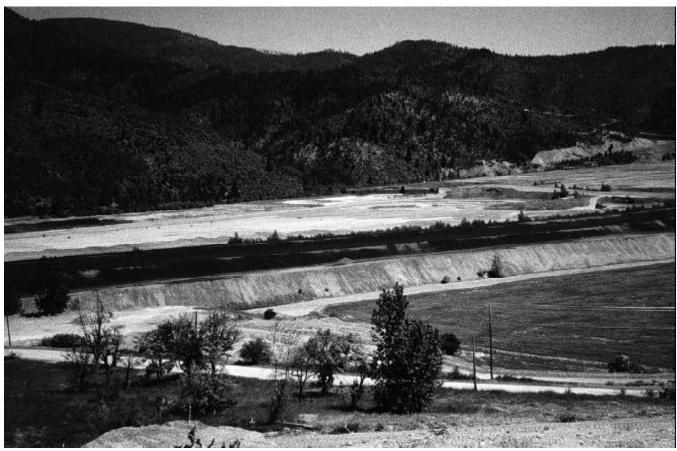
The Future for Bunker Hill

CIA Closure

In 1999, a major step in the cleanup process at Bunker Hill will be the closure of the 260-acre Central Impoundment Area (CIA), which contains soils and waste material removed from on and around the smelter complex. The closure design was completed in February 1999; the State of Idaho had the lead on this with support from contractors Terragraphics and CH2M Hill. Closure will involve installing a waterproof PVC (polyvinyl chloride) cover to prevent any rainwater from leaching metals out of the CIA. Because the CIA has been identified as the largest source of metals loading to the river, this will be a major step forward in reducing pollution. Closure will continue through the rest of 1999, to be completed in the year 2000.

Property Transfer Status and Brownfield Grant News

Under the Superfund Program, after cleanup is complete and performance standards are in place, EPA will transfer this remediated property to the State of Idaho for long term operation and maintenance (O&M) activities. The State is currently working on a plan that will describe the specific O&M procedures that will be used, and will work with the community on this project over the next several months. In addition, under an EPA Brownfields Grant, the Panhandle Health District is working with the Silver Valley **Economic Development Corporation and** Shoshone County to assist local citizens in planning possible redevelopment projects. Brownfields grants are awarded by EPA to help communities develop vacant or underutilized properties where environmental concerns complicate or delay property sale and redevelopment.



Central Impoundment Area (CIA) looking Northeast, July 1998.

The Future for Bunker Hill

Five-Year Review in 1999

In 1999, EPA will be conducting a Five-Year Review of the populated areas to evaluate the protectiveness of the cleanup remedies chosen for the Bunker Hill Study Area. EPA hopes to complete this part of the review in 1999. The Five-Year Review is mandated under the Superfund Program and is the primary tool for determining effectiveness of remedies in protecting human health and the environment. During this review, EPA seeks community input and peer review. Any part of the remedy not found sufficiently protective of human health or the environment will be evaluated for further action. Aspects of the populated area remedy being reviewed include:

- Barrier Effectiveness
- Blood Lead Levels
- House Dust Levels
- Institutional Controls Program (ICP)
- Fugitive dust recontamination
- Other Recontamination Sources
- Arsenic, Cadmium Risks
- Sampling Accuracy
- Review Applicable Federal, State and Local Regulatory Requirements

EPA will use previously gathered information, literature searches, interviews, new sampling events, and potentially a re-evaluation of portions of the risk assessment to coordinate the 1999 Five-Year Review. Sampling has already occurred in yards, rights-of-way, and hillside areas for the 1999 review.

The Five-Year Review for the Non-Populated areas of the Bunker Hill Study Area will also begin in 1999. During this review EPA will look at cleanup goals to see what has been accomplished to date and what remains to be completed. Monitoring data from the Bunker Hill Study Area will be summarized to look at any trends or patterns. EPA will also consider Operation and Maintenance (O&M) issues.



Sikorski sky crane helicopter used for hydroseeding Bunker Hill hillsides, Fall 1998.

For More Information



Contact the Following People

Earl Liverman, EPA Project Manager Coeur d'Alene, Idaho (208) 664-4858

Sean Sheldrake, EPA Project Manager Seattle, Washington **(206) 553-1220**

Cami Grandinetti, EPA Project Manager Seattle, Washington (206) 553-8696

Mary Kay Voytilla, EPA Project Manager Seattle, Washington (206) 553-2712

Marianne Deppman, EPA Community Involvement Coordinator Seattle, Washington (206) 553-1237

(EPA's Seattle staff can also be reached toll-free at **1-800-424-4372**)

Mike Thomas, State of Idaho/IDEQ Boise, Idaho (208) 334-5879

Scott Peterson, State of Idaho/IDEQ Kellogg, Idaho (208) 783-5781

Jerry Cobb, Panhandle Health District Kellogg, Idaho (208) 783-0707

Richard Kauffman, ATSDR Seattle, Washington (206) 553-2632



Visit the Site Office

State and EPA officials are available during working hours to talk with citizens:

1005 W. McKinley Kellogg, Idaho 83837 (208) 783-5781

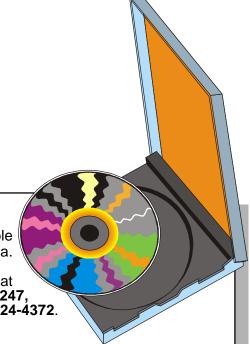


Visit the Information Repositories

All documents related to the Bunker Hill Study Area are placed in the following locations for public review:

Kellogg Public Library 16 W. Market Kellogg, ID

Pinehurst/Kingston Library 107 Main Street Pinehurst, Idaho



A CD Rom, created in April 1998, is also available with information on cleanup at the Bunker Hill Study Area.

To order, please call **Debra Packard** at EPA's Seattle office at **(206) 553-0247**, **or toll-free** at **1-800-424-4372**.

To ensure effective communication with everyone, additional services can be made available by calling EPA's toll-free number 1-800-424-4372

Web Surfing for EPA Region 10: check out our homepage at:

http://www.epa.gov/r10earth