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Agency

Solid Waste and
Emergency Response
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EPA

Superfund At Work

Hazardous Waste Cleanup Efforts Nationwide

Bunker Hill Site Profile

Site Description:
A smelting facility in the heart of Silver Valley, Northern Idaho

Site Size: 21 square miles

Primary Contaminants:
Lead, arsenic, cadmium and zinc

Potential Range of Health Risks:
Inhalation or ingestion can cause brain and central nervous system damage, chronic kidney and cardiovascular disorders, and impaired fetal development

Nearby Population:
6,000 within the site boundaries

Ecological Concerns: Contaminated ground water, the South Fork of the Coeur d'Alene River, barren hillsides, and airborne dust

Year Listed on NPL: 1983

EPA Region: 10

State: Idaho

Congressional District: 1

Success In Brief

Restoring the Environment: EPA's Efforts at Bunker Hill

Residents in the communities surrounding the Bunker Hill smelter facility in northern Idaho faced a dangerous problem: extensive lead contamination from decades of refining mined ores. Stack emissions caused a variety of environmental and human health problems throughout Silver Valley. In response, the U.S. Environmental Protection Agency's (EPA) Superfund Program, the Idaho Department of Health and Welfare (IDHW), the local Panhandle Health District, and other organizations intervened to conduct a variety of activities including:

- A lead health screening and education program;
- Removal and replacement of contaminated soil at public parks and playgrounds;
- Removal and replacement of contaminated residential yard soil from the homes of small children and pregnant women;
- Efforts to rebuild the local economy following the facility's closure.

EPA identified the liable parties and negotiated several interim cleanup actions. Comprehensive remedial plans for the smelter and ground water treatment will take seven to 10 years to complete, beginning in 1994.

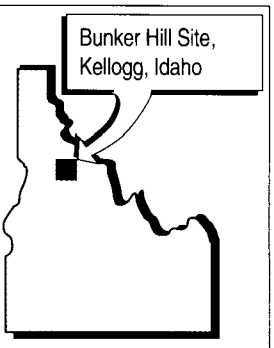
The Bunker Hill smelter facility caused extensive lead contamination of Silver Valley.

The Site Today

Under EPA and IDHW supervision, the liable parties have taken over interim cleanup actions for the "Populated Area" and have already removed the top 6 to 12 inches of contaminated soil in the yards of over 400 high-risk residences. Cleanup plans require the removal and replacement of an additional 1,200 to 1,500 residential yards over the next seven years.

The liable parties have constructed erosion control terraces and sediment control structures, and have planted the surrounding barren hillsides with over 750,000 trees to date.

A Site Snapshot



The Bunker Hill site spans 21 square miles in the heart of Silver Valley in northern Idaho, one of the largest Superfund sites in the nation. Approximately 6,000 people live within the site boundaries including the communities of Kellogg, Smelterville, Wardner, Pinehurst, Page, Ross Ranch, and Elizabeth Park. The site also includes the Bunker Hill mine, mill and concentrator, a lead smelter, an electrolytic zinc plant, a phosphoric acid fertilizer plant, a cadmium plant, and sulfuric acid plants. The South Fork of the Coeur d'Alene River runs through the site.

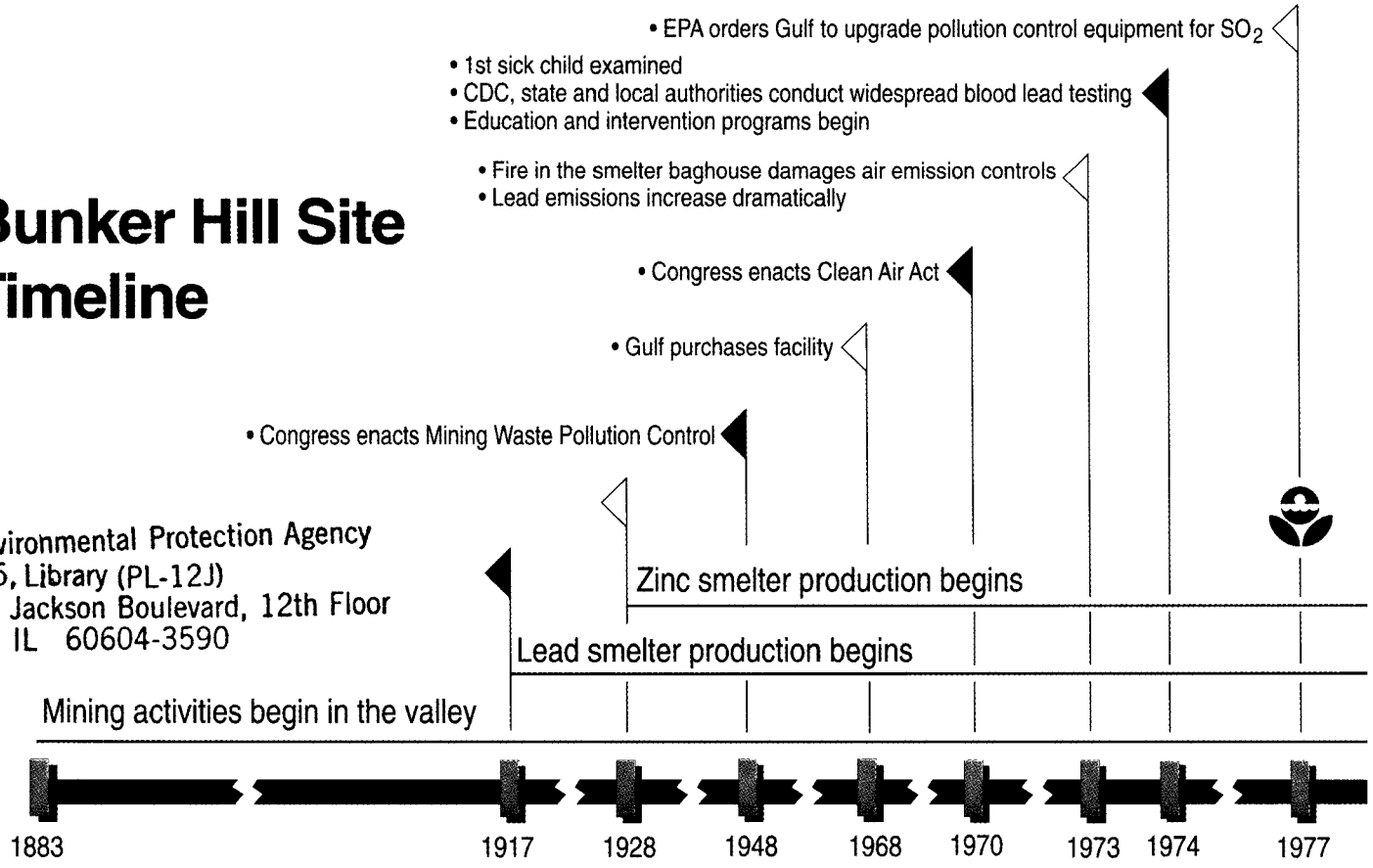
Mining activities in the valley began in the late 1800s and in 1917, a smelting facility began to process mined ores including lead, zinc, cadmium, silver, and gold. Emissions from smelting operations were poorly controlled at the stack; additional fugitive dust emissions of heavy metals and sulfur dioxide were deposited throughout the surrounding valley.

Early in the century, mine tailings (fine crushed waste rock) from the mills were deposited in the South Fork of the Coeur d'Alene River, causing contamination of the river bed. Subsequent periodic flooding spread the contaminants further along the valley floor.

Although the ground water, sediments, soil and surface water are all contaminated with a variety of heavy metals, the primary contaminant 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 present in dust blown from some of the barren areas of the site, but recent dust control efforts have significantly reduced this problem.

Bunker Hill Site Timeline



Responding to Widespread Lead Contamination

Lead smelting, which followed on the heels of ore mining, began in 1917. Solid waste from the smelting activities (slag) was piled on the western end of a large outwash plain near the town of Kellogg. A zinc processing facility opened in 1928. Most mill tailings were discharged directly to the river, although as early as 1926 some companies began building tailings impoundments.

In 1928, the Bunker Hill complex began discharging mine drainage and process water from the mill into a large unlined pond called the Central Impoundment Area. Water from this unlined pond discharged into the nearby river.

Until 1948, when the Mining Waste Pollution Control Act was passed, the federal government had no authority to monitor mining operations. Even after this law was enacted, years passed before all direct discharges of mill tailings to the river were stopped. These discharges, and leachate from the tailings ponds infiltrating the ground water, have severely damaged the environment.

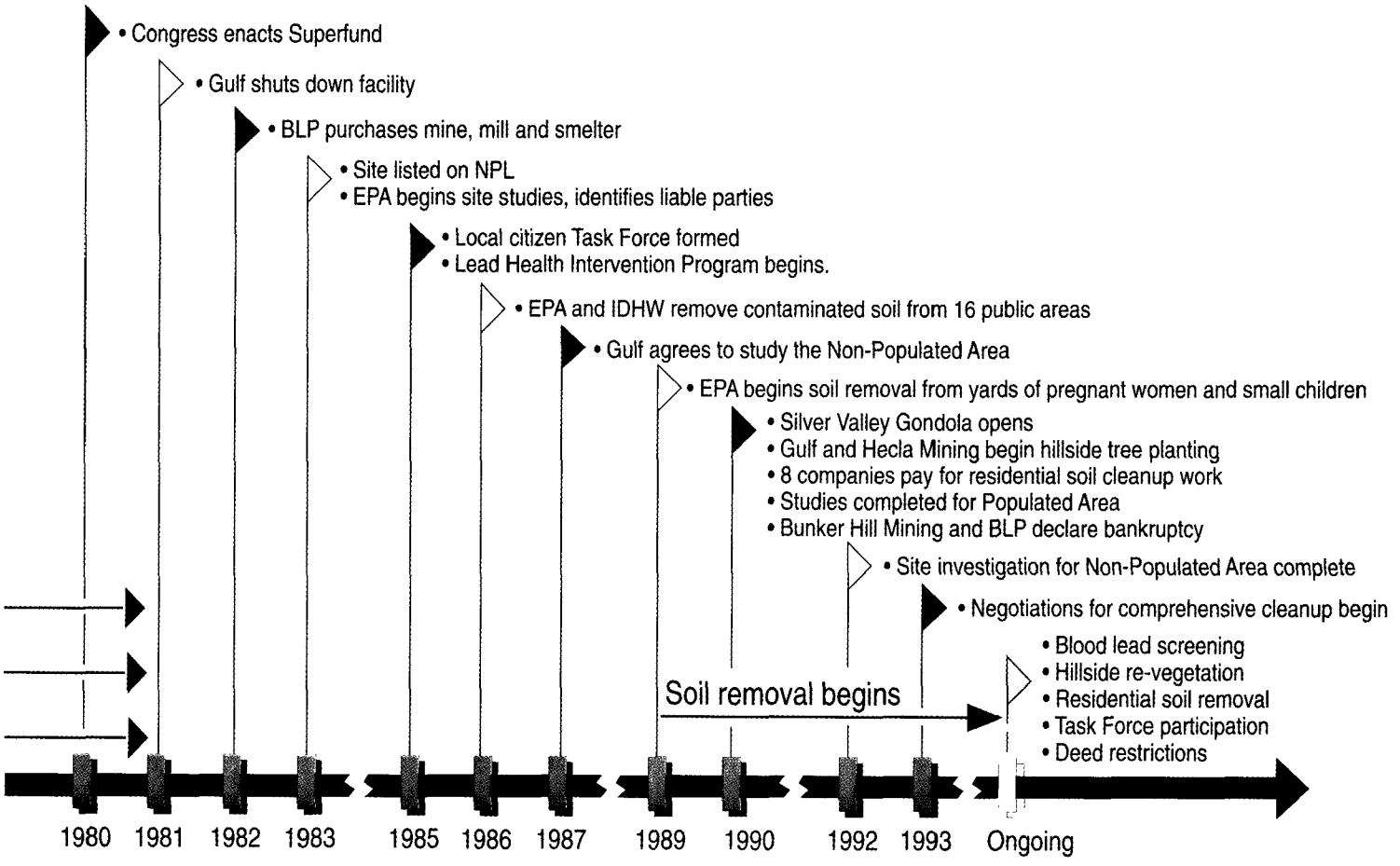
Discovery of Public Health Problems

In 1968, Gulf Resources and Chemical Corporation (Gulf) bought the Bunker Hill facility and continued operations. In 1973, a fire at the Bunker Hill baghouse (a system of cloth bags that filtered lead-contaminated dust from the smokestack emissions) crippled the smelter's air pollution control capability. As a result, lead emissions from the smelter dramatically increased for months until the baghouse was repaired.

Less than one year later, a sick child was brought to a doctor in the nearby town of Coeur d'Alene. Blood tests indicated extremely high levels of lead in the child's system. The doctor asked the local Panhandle Health District to conduct an investigation. The Health District's tests revealed lead contamination in the child's yard and in airborne dust.

Comprehensive Testing Reveals Elevated Blood Levels

Suspecting that the problem was not confined to one home, the



Panhandle Health District called the Idaho Department of Health and Welfare (IDHW) and the Centers for Disease Control and Prevention (CDC) for assistance in testing children throughout the valley. The three organizations discovered that 99 percent of the children within a one-mile radius of the smelter had very high blood lead levels. One area infant tested four times higher than the currently-accepted level. In response, the CDC and IDHW developed education and intervention programs to inform residents in these communities about preventing exposure to lead. A yearly blood lead screening program was initiated to monitor area children.

Area children had elevated blood lead levels

Air Emissions Spread Contaminants Far and Wide

In 1977, in response to IDHW reports, EPA ordered Gulf to upgrade its pollution control equipment to meet SO2 standards under the Clean Air Act. In response, the company built its smokestacks higher and threatened to shut down the facility unless EPA relaxed its regulations. Gulf was the largest employer in the valley, and closing the facility would leave more than two thousand people unemployed. Despite the company's threats, for three years EPA pursued legal actions against Gulf to meet emission standards.

In 1981, as a result of a decrease in metal prices, Gulf shut down the Bunker Hill mine, mill,and smelting complexes, andsold them in 1982 to Bunker Limited Partnership (BLP). Although the mine and mill re- opened for several years in the late 1980s,the smelting complex remained closed.

Superfund Takes Over

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishing the Superfund program to address hazardous waste sites nationwide. CERCLA authorized EPA to compel those responsible for contaminating the sites to undertake prescribed cleanup actions.

In September 1983, the site was added to the National Priorities List (NPL), a roster of hazardous waste sites eligible for comprehensive cleanup under the Superfund program. EPA subsequently identified 17 private companies believed to be responsible for remediating the site.

Division of the Site

EPA and IDHW began a series of investigations to determine the nature and extent of the contamination, dividing the studies into two parts. The first consisted of residential soil in the "Populated Area". Because the risks were more apparent, IDHW and EPA agreed to address this area first.

The second part included the smelter complex, tailings impoundments, surrounding hills, ground water, sediments and surface water, ambient dust, and adjacent commercial properties in the "Non-Populated Area".

Restoration of Residential Soil

In 1986, EPA and the IDHW removed and replaced an estimated 8,750 cubic yards of contaminated soil from public areas, parks, and playgrounds. The soil was stored in a fenced containment area away from residences. One of the liable parties later reimbursed EPA for these emergency actions.

In 1989 and 1990, EPA found high concentrations of lead near residences and removed the soil from the yards of small children and pregnant women. During those two years, EPA replaced the yards and gardens of 219 homes and two large apartment complexes. Because of concern about the local economy and high unemployment in the area, EPA hired local residents whenever possible to do the work.

The IDHW also investigated how contaminated dust could be removed from home interiors. Lead-contaminated dust is difficult to remove completely from carpets and furniture. Nevertheless, the liable parties agreed to purchase high efficiency vacuums for residents to clean house interiors.

Closure of the facility left 2,000 people unemployed

Liable Parties Begin Interim Activities

In November 1989, EPA ordered Gulf and BLP to take immediate action in response to deteriorating conditions at the inactive smelter complex. EPA identified exposed waste piles, uncontrolled salvage activities, lack of site security, dust from the barren hillsides, asbestos from deteriorated pipes and insulation, and other potential hazards.

In October 1990, EPA entered into a consent order with Gulf and

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Responding to Contamination

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Hecla Mining Company to address the barren hillsides surrounding the site. In the summer of 1991, these companies began reducing erosion of contaminated soil from the hills by re-establishing the native forest of the Silver Valley. The companies constructed 50 miles of terraces and numerous sediment dams and erosion control structures. By the end of 1993, almost 750,000 trees had been planted; one million will be planted over 3,200 acres by 1996.

Earlier that summer, EPA proposed a cleanup plan for the remaining contaminated yards in the "Populated Area". This plan included the excavation of the yards and gardens of 1,200 to 1,500 homes. These actions are expected to take seven years to complete.

Reducing the Source of the Problem

In 1987, Gulf agreed, under EPA oversight, to investigate the "Non-Populated Area" of the site. Studies were completed in 1991 and in the summer of 1992, EPA proposed a comprehensive cleanup plan that included:

- demolition of the smelter complex structures;
- removal of the worst-contaminated materials;
- continued erosion control and re-vegetation efforts;
- treatment of ground water and surface water;
- capping of tailings impoundments;
- protection of cleaned up areas through the use of local regulations and deed restrictions.

These activities will last seven to 10 years and are scheduled to begin in 1994.

EPA Recovers Cleanup Costs

In 1990, eight of the 17 companies agreed to contribute a total of $3.18 million to pay for the soil removal work that EPA performed in 1990.

In September 1991, EPA issued a unilateral order to BLP requiring cleanup of the inactive smelter complex. Both Bunker Hill Mining Company and BLP declared bankruptcy that year, but EPA filed claims against them in bankruptcy court based on their cleanup liability.

On July 13, 1992, the U.S. Bankruptcy Court confirmed BLP's Reorganization Plan, which required a deposit of approximately $5 million into an account to fund cleanup activities at the site. This amount was in addition to an initial $2 million ordered by the court earlier that year. To date, approximately half of this money has been spent on cleanup activities at the smelter complex.

Addressing the Community's Concerns

EPA's Bunker Hill Team worked hard to inform and educate local residents about the cleanup process. Community relations staff used a variety of tools including site fact sheets, progress updates, public meetings, small group sessions, public

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Community Adjusts to Change

The closing of the mine and smelter deprived the community of income and left many local residents unemployed. Undaunted, the community took a fresh look at other natural assets in the area. For years, local residents had enjoyed excellent skiing on St. Joe Mountain and decided to build a ski resort.

The key to the entire project is a single-stage aerial gondola, the longest in North America. The gondola runs between the town of Kellogg and the Silver Mountain ski area, and serves as a year-round tourist attraction. This project is considered a cornerstone for rebuilding the economy of the Silver Valley.

Construction of the gondola was the result of cooperation among state and federal agencies, the City of Kellogg, residents, and local businesses. Everyone involved realized that the environmental restoration of the area would mean little if area residents were forced to move due to economic hardship. Tourism would bring a new source of income for local residents. In 1987, a $6.4 million Forest Service appropriations bill was passed that paid for half the construction costs of the gondola. To help cover the remaining costs, the local residents voted to increase their own taxes.

The gondola opened in 1990 and tourists have started to come to Silver Valley. Jobs are still scarce, but the community remains optimistic that the economy will recover. Hotel/motel occupancy rates were up 20% from 1991 to 1992, and the ski resort showed a 40% increase in business.

Lead Contamination

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information repositories, and incorporation of individual comments in proposed cleanup plans. Two of the Bunker Hill project team members also live in the area and have an open and accessible relationship to the community.

In 1985, the Shoshone County Commissioners established a Superfund Task Force comprised of local citizens to facilitate communication among all the agencies involved at the site and the affected communities. The group has held over 40 public meetings and has been a key participant in the decision-making process. In addition, there have been over 100 meetings with local civic organizations and several workshops to better educate financial institutions and investors.

One workshop sponsored by Congressman LaRocco in March 1992 focused on the economic development of the community. Concern over Superfund liability caused many investors to hesitate to develop in the area. Lending institutions and investors are better informed now about Federal Housing Administration (FHA) procedures to insure bank loans. In addition, efforts are under way to develop a large tract near Smelterville as an industrial park and to attract other enterprises to help diversify the local economy.

Success at Bunker Hill

EPA and the liable parties have conducted many cleanup actions at the site. These actions, coupled with ongoing education to minimize exposure to lead, have resulted in an average blood lead level decrease from 65 micrograms per deciliter in 1974 to 8 micrograms per deciliter in 1992.

Contaminated soil and sod from more than 400 yards and gardens and 16 public properties have been replaced. Approximately 750,000 trees are growing on the once-barren hillside slopes. Controls are in place for windblown dust, erosion and sediment movement. Mercury acid sludges have been removed from a fertilizer plant and shipped off-site for disposal.

Negotiations for the remaining cleanup actions of the old smelter complex and area ground water are ongoing.

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