An Unexpected Silver Lining in the Silver Valley

Environmental Impacts Requiring Remediation

I. Intro – Bunker Hill is a unique site for two primary reasons. 1) one of the first community wide lead cleanups setting a precedent for successful approaches.; 2) Also a watershed scale contamination site requiring watershed scale remediation. National Academy of Sciences book about Bunker Hill -"Superfund and Mining Megasites"

II. 1973 Baghouse Fire at the Bunker Hill Smelter
   a. Before the fire particulate emissions were 10 to 20 tons per month; After fire 15 to 160 tons per month containing 50 to 70 % lead
      i. 30 tons of lead per square mile deposited in Kellogg
      ii. 25 tons of lead per square mile deposited in Smelterville
      iii. House dust lead levels measured up to 40,000 PPM
   b. Health impacts
      i. 98.8% of children had blood level greater than 40 micrograms per deciliter
      ii. One child had 164 micrograms per deciliter in blood – one of highest ever measured
      iii. Perspective - Flint, Michigan levels 2.33 in 2006 to 1.15 in 2016 (a historic low)
   c. Large scale epidemiology study
      i. Began regular annual testing as well as soil and house dust testing.

III. 1983 Superfund listing – driven by Human Health impacts
   a. Federal Law – EPA requires State involvement; State's goal across several Governors was to recreate healthy communities in the Silver Valley; State worked closely with Governor appointed Silver Valley Task Force; Local leaders helped guide cleanup based on the need to reinvigorate the local economy by addressing concerns of being called a "dirty town"
   b. RIFS process including risk assessment that leads to ROD – the decision of how to cleanup sites
   c. 21 square mile area – topo map 3 x 7 sections that covered smelter impacted areas with elevated blood lead levels. This is the Bunker Hill Box.
   d. Data from Bunker Hill was used to create the Integrated Exposure Uptake Biokinetic (IEUBK) Model
   e. Acceptable lead levels since 1970 decreased over time from 40, 30, 25, 10, 5 micrograms per deciliter of blood
   f. Lead health effects – primary concern is neurological development in children and exposure to baby in womb. Also, long term impacts on adults, mimics calcium in the body.
   g. Decrease in acceptable levels drove expansion based on risk cause primarily by smelter impacted areas to mine tailings areas. Still in the Box but cleanup expanded to include Pinehurst

IV. RODs 1991, 1993 Focused on Human Health
   a. Populated Areas – Soil removal and replacement
   b. Control of industrial and other source areas – mine operations area, demolition of Bunker Hill Complex including smelter
   c. Populated Area work completed by mining companies in 2008 have been remediated
   d. Institutional Controls Program and Lead Health Intervention and education – Play Clean

V. Site Expansion RODs 2002 and ROD Amendment 2012
   a. Addressed human health risk in Upper Basin communities and in Lower Basin. Did not include CDA.
   b. Remedial plans to address surface water cleanup – Water treatment, control upstream sources Not a final remedy because so many of the tailings are not accessible for removal.
   c. Protect existing remedies from small side drainage flooding – doesn't address SFCDR and Pine Creek flooding
   d. Notice I didn't mention groundwater – there are some GW remedies, but are designed to improve water quality

VI. Surface Water Remediation to protect fish and wildlife
   a. Metals of concern lead, cadmium, arsenic and zinc
   b. Lead and zinc move down the river system by different mechanisms – lead in sediment flows and zinc is dissolved
   c. Lead ladened sediment deposition during flood events has contaminated the flood plan in the Lower Basin
   d. We would use references like 3 times the standard for metals
   e. Lake Management Plan for CDA Lake that has an estimated 44 – 50 M of contaminated sediments on the lake bottom. Lake meets DW standards except during high water events when sediments are mobilized from river bottom and upstream sources.
   f. During low-flow periods, total lead loads as low as 30 pounds per day have been measured in the Coeur d'Alene River at Harrison. By contrast, during the 100-year flood event in February 1996, an estimated 1,400,000 pounds of lead were discharged to Coeur d'Alene Lake in a single day.
   g. Remedial approach – Source control – removing tailings and other mine wastes from contact with water and disposing in repositories, capping in place, and some collection and treatment at adits and the Bunker Hill Central Impoundment Area.

VII. Current status –
   a. Human health cleanup continues – for rec sites and new development through the ICP, health intervention and education
   b. Water quality works is focusing on upstream sources in Canyon Creek and constructing a GW collection and Treatment system around the CIA.
   c. Lake Management Plan is still in place for the Lake, but there is some pressure for more EPA resources to address the problem
   d. Community has evolved since 1983 – fewer mining jobs, bedroom community to CDA, more recreation focused, trying to diversify economy, recently completed over $50M in road projects from cleanup and extensive sewer and water line work


BUNKER·HILL·SMELTER

Table 1[756] Mean blood lead levels of children at varying distances from the smelter stack in 1974 and 1975 (ug/dl).

	1 mi. or less	1-2.5 mi.	2.5-6 mi.	6-15 mi.
August 1974	68.3	49.1	34.7	33.3
August 1975	47.1	39.3	31.4	26.7

Wednesday
August 1, 1990

Seattle Post-Intelligencer

The voice of the Northwest since 1863

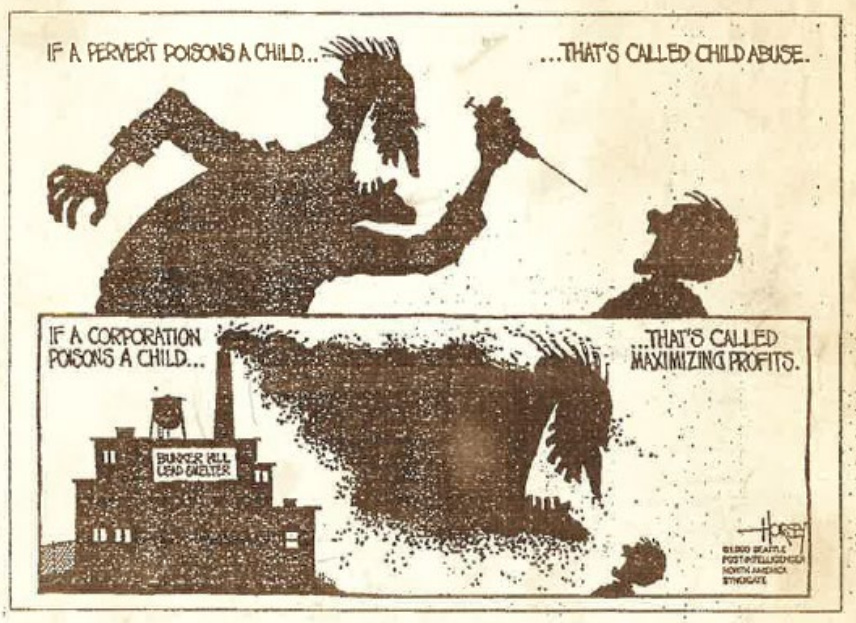
Editorials

The awful lesson of Bunker Hill

Even 16 years after the fact, the news that managers of the Bunker Hill smelter near Kellogg, Idaho, endangered people and the environment by allowing the plant to spew out massive amounts of lead is shocking and infuriating.

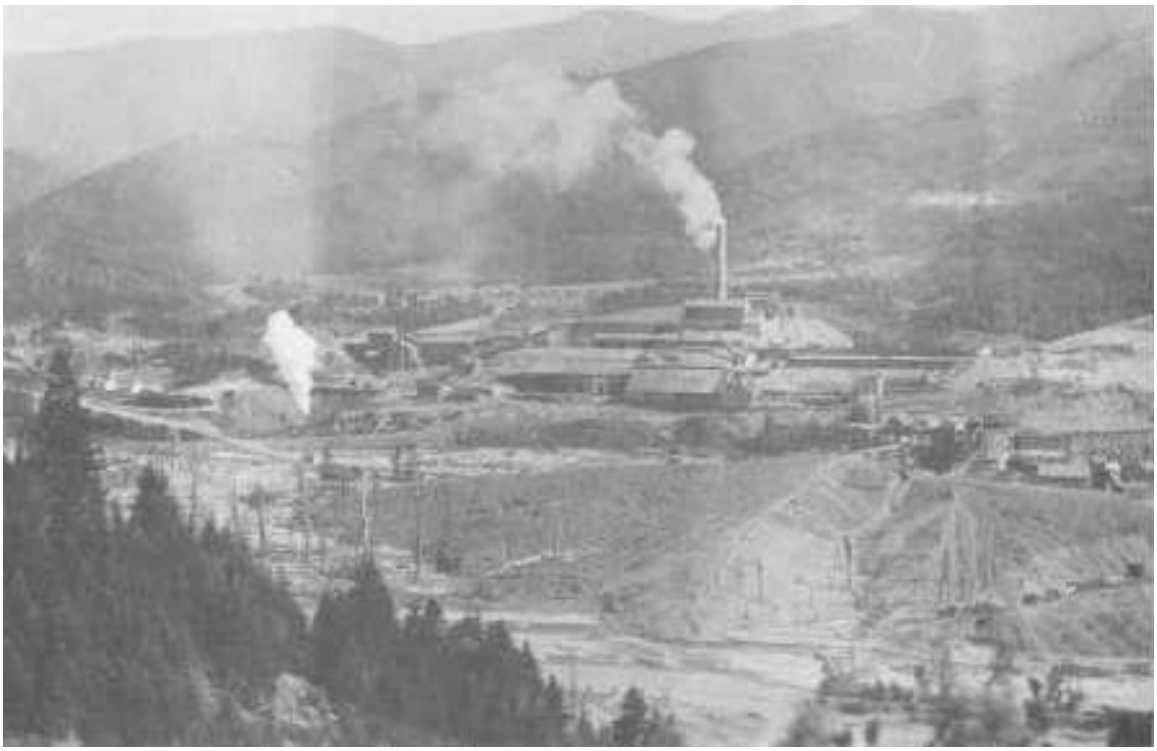
Federal court records, made public only a month ago, and detailed in a story Monday by Post-Intelligencer reporter Bill Richards, show that in 1974 officials of the plant, then owned by Gulf Resources & Chemical Co., decided to pump thousands and thousands of pounds of lead directly into the air. Bunker Hill's vice president for environmental affairs said they did so because lead prices were high and they didn't want to stop production long enough to fix the fire-damaged baghouse which normally filtered out lead from the emissions.

In other words, profit was more important than the hundreds of Kellogg-area children who absorbed lead from the plant into their blood and thereby risked nerve, brain and kidney damage. Researchers found that 98 percent of the community's children had



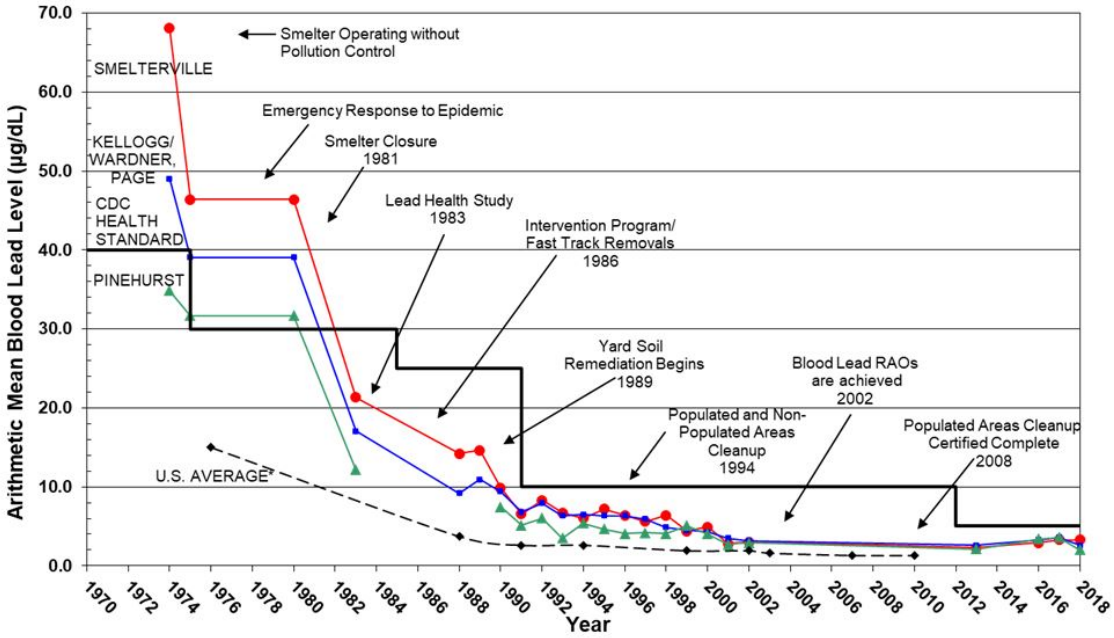
these years later, there is yet reason to dwell on this deplorable episode: The Bunker Hill mistakes are a warning to avoid similar ones today.

facts about Bunker Hill's dirty emissions because a judge agreed to seal court records after Gulf paid $9 million to settle a lawsuit involving the alleged lead



We may or may not want to show the video. It is almost two minutes long. Sound is interesting.

Bunker Hill Box Average Blood Lead: 1974-2018



*Ref.=(Mahaffey et al. 1982; Pirkle et al. 1994; Pirkle et al. 1998 ; Lofgren et al. 2000; CDC 2013)


COLORING CONTEST
Excelsior Cycle
Kellogg Pool
Wallace Pool
WE PLAY CLEAN
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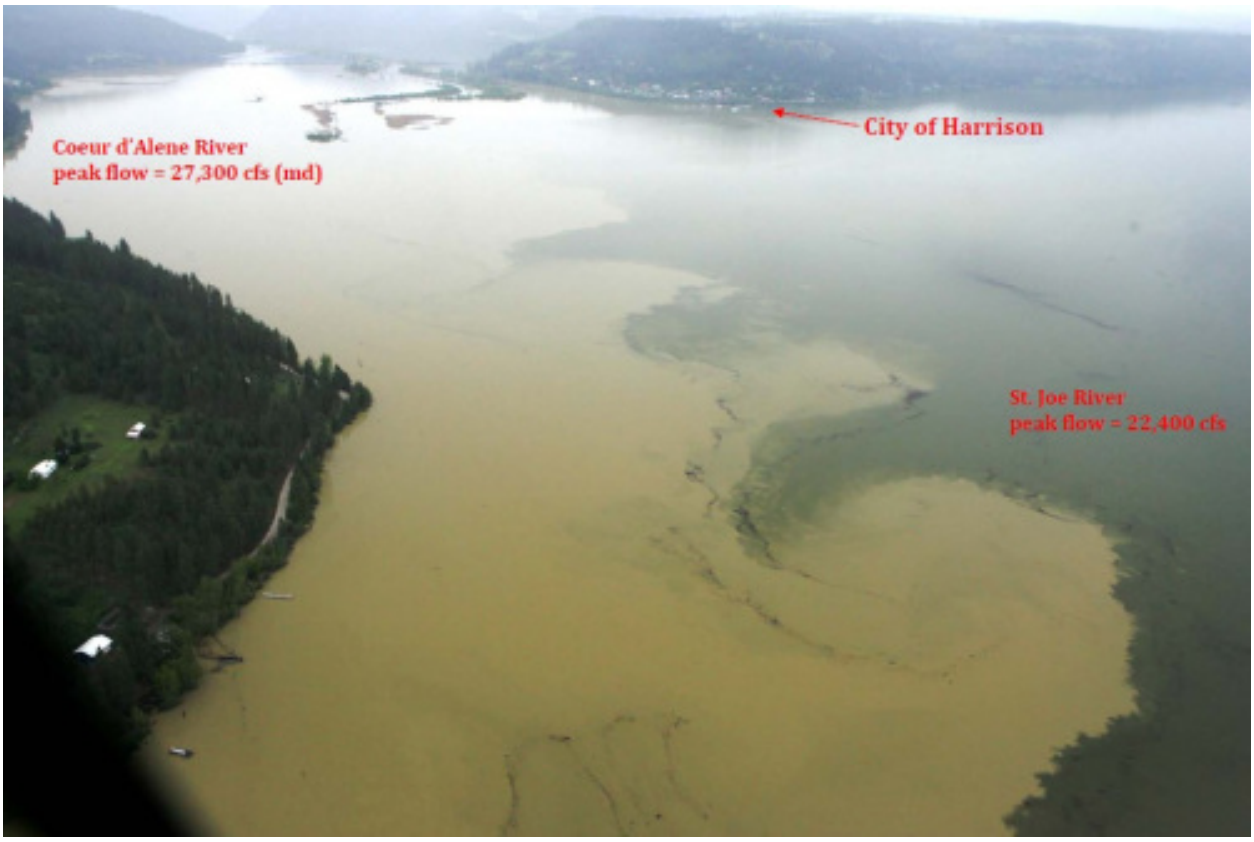
City of Harrison
Coeur d'Alene River
peak flow = 27,300 cfs (md)
St. Joe River
peak flow = 22,400 cfs

Airport Rd
Theater Rd
W McKinley Rd
Smelterville
K St
H St
Silver Valley Rd
Page Rd
Eichel St
Utah St
Helen St
Kellogg
Teddy Ave
W Park
E Portland Ave
E Market Ave
Division St
Price St
Main St
Image U.S. Geological Survey
Google earth
Tour Guide
Imagery Date: 7/8/1998
eye alt 22157 ft


Airport Rd
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Page Rd
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Imagery Date: 5/29/2014 47°32'25.72" N 116°09'29.74" W elev 2471 ft eye alt 22157 ft