'Like a World War II battlefield': How one of Northern California's most polluted properties may finally be cleaned up

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The legacies of California's 1849 Gold Rush and the relentless search for gold that continued decades later are well known: the rise of San

Francisco, statehood, Wells Fargo, Levi's jeans, and a Bay Area football team named after the fortune-seeking miners.

But along the shores of Clear Lake, just north of Napa Valley's famed wineries, is another gold-rush legacy: toxic pollution.

From the 1860s until it closed in 1957, the Sulphur Bank Mine was one of the largest mercury mines in the United States. Gold miners in the Sierra Nevada used the mercury dug from its deep tunnels and craggy cavities to separate gold from the ore that held it.

Today, what's left is a rocky, open pit as large as 20 football fields, filled with murky blue-green acidic water 90 feet deep and surrounded by a barbed wire fence adorned with "Danger EPA Superfund Site" signs. Massive piles of mining waste around the rest of the 160-acre landscape, enough to fill 250,000 dump trucks, are contaminated with arsenic, mercury, and other toxics.

"It's got kind of a bomb-crater character to it," said Jeffrey Mount, former chairman of the geology department at UC Davis. "It's like the surface of Mars. It's highly polluted. Nothing much grows there. The whole place looks like a World War II battlefield."

Now a major effort has begun to clean up the historic mess and reduce health threats to people who have called the area home for thousands of years.

In November, the U.S. Environmental Protection Agency approved a $94 million project to clean the mine site. The plan, funded in part by the bipartisan infrastructure law that President Biden signed in 2021, is the largest cleanup funded by the government at any of the 97 Superfund sites in California, a list that includes many of the most polluted properties in the state.

Scientists say the abandoned mine's pollution is leaching into Clear Lake, only 500 feet away. The pollution is contaminating bass and other fish in one of the oldest and largest freshwater lakes in California, and endangering the health of those who eat them.

Compounding the threat, directly adjacent to the site is the Elem Indian Colony, a Native American community that has been exposed to the toxins for generations.

"This is one of the most serious mercury sites, if not the most serious mercury site, in California," said Carter Jessop, the EPA's project manager for the cleanup. "It has contaminated a lake that is of profound tribal significance and regional significance. It has dramatically diminished the lake."

Work is scheduled to begin next year.

Crews will move waste rock from nine huge piles into as few as three. They will seal it with a plastic barrier, and cover it with soil at least two feet deep. They'll plant grasses, shrubs and other plants, and will remove and replace roughly half of a large waste rock dam located between the pit and the lake, tear down old mining buildings, and channel stormwater away from the pit.

The project, when finished around 2029, should reduce the amount of mercury going into the lake by 95%, EPA officials estimate.

Leaders of the Elem Indian Colony, a Pomo tribe, are thankful for the work, but they say it has taken too long. And they'd like it to be even more extensive.

"I'm 41 years old," said Agustin Garcia, chairman of the Elem Tribal Council, based in Santa Rosa. "When the EPA first came in to do

sampling here, I was 8 or 9. Our people are still fighting the fight. We are hoping the remediation will be done in our lifetime. But I inherited it from my parents, and they inherited it from their parents, and they inherited it from their parents. It's grim."

The rural area, roughly 30 miles north of the tony shops and vineyards of Calistoga, is a world away from the Bay Area.

Lake County's median household income of $53,399 is far below the state average of $84,097, and less than half of most Bay Area counties. Many of the jobs in Lake County are low-wage, causing young people to leave.

"It's unfortunate this cleanup has taken so long," Garcia said. "We weren't on the top of the priority list. It seems like we never are."

EPA officials say that since they first placed the site on the Superfund list in 1990, they have completed eight other cleanup operations at the mine, gradually improving the site as federal funding became available.

"We've made incremental progress," said Mike Montgomery, the EPA's regional Superfund director. "But this is a big step forward."

In many ways, Sulphur Bank Mine, named for the bubbling pools of sulfur that existed there when Abraham Lincoln was president, is a large, and costly tip of a very big problem in California and the American West.

There are roughly 47,000 abandoned mines in California dating back to the 1850s, according to the state Department of Conservation. More than 5,000 still pose environmental risks. In many cases, the original owners are long dead. Bradley Mining Company, which operated Sulphur Bank from the 1920s until it closed in the 1950s, went bankrupt.

Left holding the bag? Taxpayers.

Old mercury mines, including the former New Almaden quicksilver mine south of San Jose—for which the San Jose Mercury News was named in 1860—and the New Idria Mine, a Superfund site in rural San Benito County, have been among the most difficult to clean up.

"When people came out West in the 1800s, it was an infinite landscape of resources and opportunity," said Mount, the former UC Davis geologist, now a senior fellow at the Public Policy Institute of California in San Francisco.

"The goal was to grab as much as you could. Sulphur Bank Mine is just one example of that," he said. "Basically the cleanup now is a taxpayer subsidy for historic mining efforts. So much damage was done. They left these truly intractable problems. It's almost like you want to hang somebody for it. But you'd have to go dig them up."

Previous generations clear cut forests. But forests grow back eventually. They overgrazed landscapes, but those recover when the cattle move on. They dammed rivers. Yet even dams can be taken down when they outlive their usefulness.

But the damage from mines can last hundreds, potentially thousands of years, Mount said.

Permits for new mines are very difficult to obtain because of local opposition and strict environmental regulations. Cleanup plans are required when operations are finished.

But mines that closed generations ago operated when few if any rules were in effect.

"They can spend millions to clean up the Sulphur Bank Mine," Mount said. "But the legacy of the mine is all the mercury in the sediments of Clear Lake. They will shut off the new sources, but there is already a load of mercury in the lake."

To remove that could involve a huge dredging operation, or capping it with clean sediment, or piping oxygen into the water to reduce the chances of the mercury being absorbed by fish and wildlife. Any such project is years away.

So the risk continues.

When mercury flows into bodies of water, bacteria can convert it into a form called methylmercury that is easily absorbed by small plants and animals, and accumulates in larger, older fish. When people eat the fish, it can harm the brain and nervous system, especially in unborn babies and children.

After scientists discovered fish with large amounts of mercury, state health officials issued an advisory against eating bass, carp and other fish in the lake in 1987. Clear Lake was among the first major bodies of water in California to have such a warning, which urges children under 17 and women of child-bearing age to eat no more than one fish of most species a week from Clear Lake, and no bass.

But generations of Elem tribe members, whose people date back in the area an estimated 12,000 years, ate lots of fish.

"I was born in 1982 and I remember eating fish from there until I was 12 or 13 years old," Garcia said. "My uncles and I would put traps around the lake and we would have big fish fries all the time. I don't think the residents really became aware of the problem until the late 2000s. Everybody was fishing in the area."

The tribe has 120 members today. Decades ago, many lived on 49 acres of tribal land next to the mine. In the 1970s the Bureau of Indian Affairs paved roads and filled areas there with waste rock from the mine, unknowingly exposing the residents to even more arsenic and other hazards. Most of the waste rock in the residential area has since been removed by the EPA and its contractors. But many of the people in the community moved away. Today only about 10 homes remain.

"We were here before the mine site. We were here during the mining. And we'll be here after," said Piyaco Brown, one of the remaining residents.

Elem tribal members all have stories of serious health problems, from developmental disabilities to cancer.

"None of our parents are still alive. They all died of cancer in their 50s and 60s," Brown said during a recent visit to the site.

Proving a direct cause-and-effect relationship is difficult in many polluted areas. Cancer can be caused by lifestyle choices, including diet and smoking. Some people have higher family history risk than others.

A 1992 federal study of 63 Elem tribal members, most of whom lived adjacent to the mine, found that the average concentration of organic mercury in their blood was significantly higher than the average U.S. resident, but not at the level where symptoms of mercury impairment usually develop.

A more recent EPA study in 2020 found that for every 10,000 people who lived along the lake near the mine, there would be an additional seven cases of cancer due to the toxins at the mine, mainly from arsenic in the soil. While still relatively low, that's seven times higher than the risk EPA considers serious enough to trigger cleanups of environmental

contaminants.

The study also computed a "hazard index" for people living in the area. The score, which estimates total risk of exposure to toxic substances, was 39 for adults and 107 for children. A normal score is 1.

"We were the last generation of kids who played out here," said Clifford Brown, a tribal member. "There were still open mine shafts. I never swam in there," he said on a recent visit to the site, pointing to the huge pit, which smelled of rotten eggs. "But I had friends who did."

"In a perfect world, it never would have happened," Brown said. "But it did. We want to keep making progress. We want the cleanup done. We are tired of it. We want it fixed for our children and our grandchildren so that we can say we left them something better than we had."