

Examples of Modern Mines that Damaged Rivers & Fisheries

(Compiled by Mara Bacsujlaky, October 2004)

The mines that are featured here are all mining operations whose main components were developed within the last 30 years, using “state-of-the-art”, modern hardrock mining technology. A few are located at places where previous mining had occurred (Summitville, Baia Mare, Molycorp). Unfortunately, the leakages and dam failures that caused both short and long term damage to aquatic resources are not examples of isolated, unusual accidents, but are common characteristics of hardrock mines with large tailings impoundments and dams. These accidents and/or chronic leaks differ only in level of severity and duration of impact to aquatic resources, and in some cases, public health. In all cases, contaminants from the hardrock mining process were the cause of pollution; additionally, in all examples cited here, the operations were subject to extensive engineering design and environmental review processes conducted by governmental bodies – both local and federal. Water pollution occurred both to ground and surface waters – and involved releases of either cyanide, heavy metals and acid generated from mine waste.

BAIA MARE GOLD MINE, Romania

- *Operated jointly by an Australian and Romanian mining companies, Baia Mare reprocessed mine waste from earlier activity to recover gold, silver and other metals.*
- *In January 2000, the tailings impoundment dam failed, resulting in the release of 130 cubic yards of mine waste contaminated with cyanide and heavy metals.*
- *Result was disruption of drinking water supplies in 24 locations and for 2.5 million people and massive fish kill in the Tisza River.*



A Hungarian fisherman gathers dead fish from the Tisza River, © Pearson Education, 2000

Summary:

Located in Romania, in Eastern Europe, Baia Mare was a recovery operation intended to mitigate chronic pollution problems from previous mining activity, while at the same time, its operator, Aurul, recovered precious metals still remaining in the mine waste. Aurul was a joint venture company formed by Australian and Romanian mining interests. The Baia Mare tailings dam was designed to be the most modern in the region, with the dam fully lined so there would be zero discharge of mine waste to the environment.

Environmental and Public Health Impacts

On January 30, 2000, as a result of snow and rain, water in the tailings impoundment overtopped the dam, resulting in a break in the dam. One hundred and thirty cubic yards of mine waste containing approximately 75 tons of cyanide flowed into the Sasar River, and then into the Somes. The Somes is a branch of the Tisza river, the second largest river in Hungary. All of these rivers are part of the larger Danube River system. In all, over 1,200 miles of the Danube River system were contaminated. The spill threatened the drinking water supplies of 2.5 million people and caused enormous damage to wildlife in Hungary and Yugoslavia. It was estimated that 80% of all fish in the Tisza River died as a result of the spill.

As CNN reported on February 14, 2000, “dozens of volunteers, fishermen and locals, wearing protective rubber gloves, removed hundreds of dead fish from the Tisza so that they could be buried. ‘Everything's dead, cyanide destroyed the entire food chain,’ said fisherman Slobodan Krkjes, 43, in a broken voice. ‘Fishing was my job. I don't know what I'm going to do now.’”

Long-term Effects

Cyanide quickly breaks down in natural systems, so its impacts are very short term (i.e. acute). Although the cyanide spill from Baia Mare killed nearly all of the fish in the Tisza River system, toxicity of the cyanide plume quickly diminished in the days following the spill. On the other hand, the heavy metals contained in the waste did not cause immediate harm to aquatic resources, but because they do not move out of an aquatic system, and some may bio-accumulate, these are more likely to cause long-term (chronic) effects to fish and wildlife. The rivers that were impacted by the Baia Mare dam failure already contained elevated levels of heavy metals as a result of a lengthy history of mining activity in the region.

In the years since the spill, the Tisza River recovered faster than expected, but its upper reaches remain severely impacted. Additionally commercial fishermen found they couldn't sell their fish because despite expert assessments that Tisza fish are now safe to eat, the negative publicity from the contamination remains. Tisza fish used to be famous in Hungary for their fresh taste – but in the months after the spill, demand for Tisza fish dropped to less than 20% nationwide. Although the market has recovered since, the adverse publicity from the spill still has a lingering effect on the Tisza fishing industry.

Sources:

Tailings Spill Accident in Baia Mare, Romania, January 30, 2000, Mineral Resources Forum, United Nations Environment Program.

Spill Of Liquid And Suspended Waste At The Aurul S.A. Retreatment Plant In Baia Mare, United Nations Environment Programme, UNEP /Office for the Co-ordination of Humanitarian Affairs, OCHA, Assessment Mission, Romania, Hungary, Federal Republic of Yugoslavia, 23 February - 6 March 2000

Signs of Life on Tisza and Danube, David Langencamp in the Christian Science Monitor, March 8, 2000

Gold Mine Company Denies Responsibility for Huge Cyanide Spill, Wire Report, CNN, February 14, 2000.

SUMMITVILLE GOLD MINE, Colorado

- *Open pit, cyanide leach gold mine, operated 1986 – 1991.*
- *17 miles of the Alamosa River downstream of the mine no longer supported aquatic life after cyanide, heavy metals and acid leached from the mine site.*
- *Site is currently a Superfund Site, with the US Environmental Protection Agency and the State of Colorado expending over \$170 million in clean up and stabilization of the site.*



Summitville CO, Oct. 1993, from aerial photo by IntraSearch Inc.

Summary:

Located in south central Colorado, the Summitville Gold Mine was an open pit heap leach gold mine that used cyanide to extract gold from the ore. The mine operated from July 1986 through October 1991 – when it was abandoned and its operator, Summitville Consolidated Mining Corp. Inc. declared bankruptcy. Since then the US Environmental Protection Agency and the State of Colorado have spent over \$170 million cleaning up and stabilizing the mine site.

Legal attempts by the United States government to hold the mine operators accountable and fiscally responsible for cleaning up the pollution and reclaiming the mine site failed.

Environmental and Public Health Impacts:

The Alamosa River downstream of the Summitville Mine is used extensively for livestock watering and agricultural irrigation. Principle crops include wheat, barley, alfalfa and potatoes. Wetlands associated with the Alamosa are important habitat for migratory waterfowl and the endangered whooping crane. As of 2001, 10 years after the mine ceased operations, 17 miles of the river downstream of the mine still supported no aquatic life.

Contamination of ground and surface waters down-gradient of the mine began shortly after open pit mining started. Cyanide-laden solution leaked into groundwater below the heap leach pad and on several occasions leaked from transfer pipes directly into Wightman Fork, a tributary of the Alamosa. Additionally, acidic, metal bearing drainage seeped from numerous sources around the mine site, including a mine waste dump. The metals that contaminated the Alamosa included copper, cadmium, zinc, lead and aluminum. The ph of the mine acid discharge was about 3 (rivers are generally a neutral 7). The acid and the metals came from the decomposition of sulfide-bearing minerals in the ore and waste rock mined at Summitville. These include chalcopyrite and pyrite, which are found in abundance at Pebble.

In 1990, all stocked fish in the Terrance Reservoir and in farm holding ponds along the Alamosa River disappeared. Acid and metal contamination from the mine site is assumed to have been the cause.

Sources:

OF 95-23, United States Geological Survey, 1995

Newsletter, Vol. 5. No. 4, The Clean Water Action Council of Northeast Wisconsin, June 2001

Colorado Department of Public Health and Environment at:

<http://www.cdphe.state.co.us/hm/summitville.asp>

SNAPSHOTS OF OTHER MINES & INCIDENTS

GILT EDGE MINE, South Dakota

- An open pit cyanide gold mine, the Gilt Edge was abandoned by Dakota Mining in 1999, when the company declared bankruptcy. Dakota Mining also abandoned the Illinois Creek gold mine near Kaltag, Alaska – leaving the State of Alaska with the financial burden of reclaiming the mine.
- Production began at the Gilt Edge in 1988; by 1992, acid mine drainage had developed, and over the remaining years of operation, Dakota was cited numerous times for environmental violations and lack of compliance with pollution limits. Numerous cyanide spills occurred, and cyanide was detected in groundwater and nearby creeks.
- As a result of the mine's acid mine drainage, local streams no longer support viable fish populations; for example, the ph level in Ruby Gulch Creek dropped to 2.1.

- Current estimates for clean-up and reclamation of the mine are about \$15 million. Since the company had posted an insufficient bond of \$6 million, the burden of paying for the remainder will likely fall on taxpayers.

GROUSE CREEK MINE, Idaho

- A cyanide vat leach operation, the Grouse Creek gold mine began operation in 1994, shutting down for good three years later. Operated by Hecla Mining Company, the mine not only failed to produce the predicted amount of gold, it left behind a legacy of pollution.
- In 1994, a major landslide at the mine buried nearby Jordan Creek; numerous cyanide spills and leaks also occurred. In 1996, Hecla was fined \$85,000 by the US Environmental Protection Agency for violating its discharge permits. Cyanide and mercury exceeded allowable discharge levels by more than five times over a period of 13 months.
- Two years after the mine quit operations, cyanide was still flowing into Jordan Creek at over 12 times the levels at which chronic exposure to the chemical negatively affects fish and other aquatic organisms. Jordan Creek is important habitat for endangered Chinook salmon, steelhead and bull trout.

MOLYCORP MOLYBDENUM MINE, New Mexico

- Current operations began in 1964 as an open pit mine; Molycorp is now mining underground. Over 100 tailings slurry spills into the Red River were documented in a five-year period.
- As a result of acid mine drainage and heavy metal contamination leaching from the mine, at least eight miles of the Red River downstream of the mine are biologically dead. This portion of the Red River once was habitat to a blue-ribbon trout fishery.
- Residents of Questa, the small town nearby, reported the Red River just below the mine turned milky blue from the aluminum coating the riverbed. Other heavy metals such as copper, lead, zinc and cadmium have been detected at both acute and chronic levels in a 20-mile stretch of the Red River.
- Toxic dust containing lead often blew into Questa from the enormous tailings storage ponds. The local high school had to be relocated, at the mine's expense, because of ongoing problems with the dust clouds.

Source:

Six Mines, Six Mishaps: Six Case Studies of What's Wrong with Federal and State Hardrock Mining Regulations and Recommendations for Reform, Mineral Policy Center, September 1999