

A Mining Truth Report

Will sulfide mining companies play by Minnesota's rules?

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mining sites may last for thousands of years**



**Conservation Minnesota
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**In spite of state law, costly treatment for sulfide mining sites
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Minnesota law requires that sulfide mines be “maintenance free” at closure. This means that a mine site cannot be an ongoing source of pollution when it is closed. But the waste rock generated by sulfide mining is the source of dangerous pollution that will, by at least one mining company’s own acknowledgement, remain toxic for thousands of years. Persistent pollutants at sulfide mining sites will almost certainly require some sort of maintenance into perpetuity.

**Permitting a sulfide mine in Minnesota may well defy both
law and common sense, requiring costly perpetual
treatment and monitoring for generations to come.**

Northern Minnesota’s wild forests and pristine lakes are the focus for new mine proposals that could forever change the region. The two major mine proposals, the NorthMet and Twin Metals projects, may leave a legacy of treatment and monitoring costs for generations. These new mines, different than Minnesota’s traditional iron mines, would extract copper, nickel and other metals from sulfide ore (hence the name “sulfide mining”). They will also leave behind huge volumes of waste rock containing toxic pollutants that will require long-term care, monitoring and treatment, possibly for thousands of years.

Pollutants created by sulfide mining are persistent and dangerous

Not all naturally occurring substances on Earth are benign or “safe” to humans or our environment. Sulfides are just one example. When left deep within the Earth, unexposed to air, they present no problem. But when brought to the surface, as is done with mineral extraction, sulfide ores are exposed to air and water and can oxidize to form sulfuric acid. The acid produced from this chemical reaction can contaminate the water, and the plants and animals that depend on that water, for long periods of time. Also, the waste rock that is produced from sulfide mining may contain toxic metals such as mercury, cadmium, copper and nickel. Sulfates too are a common pollutant from mining sites. These compounds are harmful

to wild rice and aid in mercury methylation – the process that allows mercury to enter the food chain.

All of these pollutants - acid mine drainage, toxic metals, and sulfates - can be discharged from a variety of places in the operation of the mine, such as open pit walls, waste rock piles, tailings, and underground tunnels – any place where the ore comes into contact with air and water. To keep Minnesota’s surface and ground waters free from sulfide mining pollution, these mountains of sulfide ore must be contained and monitored for as long pollutants persist, which can be hundreds or thousands of years, possibly even forever. So far, mining companies have not identified a sulfide mine that has operated and closed without generating water pollution. The industry also cannot point to a single closed mine that can contain these pollutants into perpetuity.

The pollutants and dangerous chemical reactions are far more prevalent with sulfide mining than with taconite mining. While traditional Minnesota iron mining has impacts on the landscape and produces some pollution, iron mining does not produce acid mine drainage, at least not in nearly the same quantities. The duration of the pollution is another stark difference between the two kinds of mining. Pollutants from sulfide mining exist at the site for hundreds or thousands of years, even indefinitely. The U.S. Environmental Protection Agency (EPA) estimates that pollutants from a proposed sulfide mine in Alaska will produce acid drainage “anywhere from 10 to 40 thousand years.” Toxic metals do not break down in the environment, but rather persist as contamination sources for long periods of time. The production of acid drainage will continue as long as sulfides, water and air mix.

Is Minnesota prepared to shoulder these long-term pollution problems?

Mine sites will require treatment and monitoring indefinitely

Mine pollution sources remain after mine operations cease and the site is closed. The risk of pollution from these sources does not change over time. PolyMet’s Draft Environmental Impact Statement (DEIS) concedes that pollutants will persist inside the mine pit itself. After the PolyMet mine is closed, the pit will ultimately fill with water and overflow into the Partridge River, potentially discharging contaminants into the St. Louis River watershed. (DEIS, pgs. 4.1-45, 4.1-64, 4.1-113, 4.1-123).

Similarly, the tailings basin, the place where mine processing wastes are deposited, also contains pollutants that will need to be monitored and contained for as much as 2,000 years. The tailings basin is predicted to leak into surface water. The tailings dam, the impoundment holding back the semi-liquid waste, is predicted to be structurally unstable with a “low margin of safety” and may also ultimately fail. (DEIS pp. 4.1-75; 4.1-120; Chambers 2011). Finally, the

mine site will contain huge piles of waste rock that will be sources of persistent pollutants as rain and snow run off the piles.

Perpetual treatment at a mine site is unsustainable

Concerns of chronic pollution and mine designs that fail are not merely conjecture. The Tulsequah Chief Mine, a sulfide mining operation in British Columbia, Canada, is contributing acid mine drainage and heavy metals pollution into adjacent rivers, even though the original owners of the mine shut down operations more than fifty years ago. Pools of waste water remain and continue to pollute the nearby Taku River, a tributary of the Tulsequah River, a productive salmon fishery.

The original Tulsequah Mine closed more than fifty years ago, and yet the site still requires a wastewater treatment plant.

The mine has transferred hands twice, each with abortive and discouraging outcomes. The first company to take over the mine ignored numerous cleanup orders and eventually fell into bankruptcy. In 2010, Chieftan Metals, Inc. purchased the mine, and built a \$9 million Interim Water Treatment Plant (IWTP). The plant, however, has not worked as expected and in August 2012 it was shut down in order to address the persistent and “acutely lethal” water pollution problems. In the interim, the company has to reevaluate the IWTP operations, leaving the future of the plant in doubt.

The Tulsequah mine project is precisely the type of outcome that Minnesota law is designed to avoid. Operating plans rarely, if ever, provide a strategy for how pollutants will be monitored and treated for thousands of years after closure and who is responsible for conducting monitoring and treatment for thousands of years. States have found it extremely difficult to force companies to take responsibility for cleaning up mining pollution, and efforts to hold them accountable may encounter barriers such as bankruptcy and other efforts to limit corporate liability. Is it ethical to permit a project that will hoist the responsibility for maintaining and cleaning up mine sites on Minnesotans for generations to come?

Minnesota Department of Natural Resources (DNR) rules state that a mine site be “maintenance free” at closure. It is not clear that any sulfide mine proposal can meet this standard. It also appears that the DNR does not plan to enforce the law.

DNR's rules (Minnesota Rule 6132.3200) regarding closure and postclosure maintenance of mines state that a mine should be "stable, free of hazards, minimizes hydrologic impacts, minimizes the release of substances that adversely impact other natural resources, and is maintenance free." The original Tulsequah Mine closed over fifty years ago, but the site still requires a wastewater treatment plant. Planners for Minnesota's proposed PolyMet mine have been vague on specifics of postclosure maintenance in the DEIS, stating the details regarding technical and financial planning for closure need not be done until the permitting process – after environmental review is complete (DEIS, 3-48.)¹

Despite Minnesota's law calling for a maintenance-free closed mine site, PolyMet acknowledges that "[i]nspection, maintenance, and reporting activities would be required at the Mine Site and Plant Site after the Closure activities are complete" (DEIS 3-49). Examples of this predicted on-going maintenance include:

- Treating water from the plant at the waste water treatment facility
- Monitoring the effluent from the waste water treatment facility
- Disposing of waste generated at the waste water treatment facility off-site
- Repairing erosion around the tailings basin
- Collection of seepage from the tailings basin (DEIS 3-49)

The Draft Environmental Impact Statement was produced with the Minnesota DNR as a lead agency.

The prospect of perpetual treatment is disturbing. Additionally concerning is that it can be extremely difficult for the state to determine how much money should be set aside by the mining company to pay for such maintenance and difficult to ensure the state or a mining company actually conducts the required maintenance.

The DEIS also notes that Minnesota's tribal agencies believe the impact of the project and the potential need for post closure activities would continue for hundreds or thousands of years, even into perpetuity, and as a result, the project violates the goal of Minnesota's reclamation statute (DEIS 3-49, footnotes 14-16).

By its own description, PolyMet notes its mine site will require multiple forms of treatment and monitoring after closure and into perpetuity, in violation of Minnesota law.

It also is unclear whether DNR will enforce its own rules. DNR has already allowed Polymet to avoid examining the long-term treatment and maintenance of its mines in the initial

¹ Although the EPA and other commentors objected to this delayed approach, and the issue may be rectified to some extent in the SDEIS due out in 2013.

environmental review process. DNR may also attempt to exploit potential regulatory loopholes that may be used to permit a mine that is practically guaranteed to generate dangerous pollutants for centuries.

Will the DNR do the right thing and enforce its own rules regarding closure, requiring sulfide mines to prove that they can properly reclaim their sites without ongoing maintenance?

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