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WHAT IS METALLIC MINING?

Metallic mining refers to mining for metals such as copper, gold, silver, zinc, and iron. These metals are found in ore deposits bonded to other minerals. Metallic ores in Wisconsin are generally found in metallic sulfide deposits. Metallic mining can occur as open pit or underground mines. The type of mine depends on the shape and spatial orientation of the deposit and how close the deposit is to the surface.

Many metal ores are found bonded to sulfide minerals. When exposed to air or water, sulfuric acid forms. This is known as acid mine drainage (AMD) and can have harmful effects on surrounding environments. If uncontrolled, AMD results in ecosystems with high levels of metals, dissolved solids, sulfates, and acidity.

Metallic mines are major undertakings that take many years to plan, operate, and remediate. The process is broken down into several steps:

- **Exploration**: In the exploration stage, mining companies gather ore samples from underground in order to understand what minerals are present and assess if a mine would be economically viable. Drilling core samples, sometimes hundreds of feet deep, is one method. Some exploration processes, called bulk sampling or prospecting, are more destructive and involve excavating layers of soil and rock above mineral deposits to draw down larger samples.

- **Mining**: If sufficient economic metal concentrations are found, a mining company must develop extensive plans and acquire the necessary permits before operating. Mining consists of stripping the surface of a site, removing and storing waste soils and rock, excavating a pit or boring underground tunnels to access ore, processing ores to extract metals, and depositing wastes including mineral “tailings” - the uneconomic wastes produced from processing.

- **Waste Storage**: Even after a metallic mine ceases operation, the leftover wastes must be managed for decades and often centuries to prevent contamination of the surrounding environment. This involves the construction of specialized waste facilities and ongoing maintenance and monitoring of those facilities.

ENVIRONMENTAL IMPACTS

Metallic mining substantially alters the landscape and poses environmental risks such as the contamination of soil, waterways, drinking water, and air from metals and chemical processing wastes. In fact, according to the U.S. Environmental Protection Agency, the metallic mining industry is the largest source of toxic pollution to the environment in the country. Impacts to surrounding environments can continue for decades or even centuries after a mine closes.

Impacts of mining activities outside reservations can impact Tribal lands and waters as well as treaty-reserved rights to hunt, fish, and gather in ceded territory. Mine permits must consider impacts on Tribal nations and be protective of their people and resources. For more information on Tribal impacts of metallic mining, see Metallic Mineral Mining: The Process & the Price (2016) published by the Great Lakes Indian Fish and Wildlife Commission.
Wisconsin Metallic Mining Regulation

Wisconsin regulates ferrous (iron) and non-ferrous metallic mining differently.

**Ferrous mining.** 2013 Wisconsin Act 1 created new regulations for iron mining, as overseen by the Department of Natural Resources. This new law streamlined the permitting process and reduced environmental protections. The largest iron deposit in Wisconsin is the Gogebic Range, running east to west from Michigan’s Upper Peninsula to Lake Namakagon in Bayfield County. This is a low-grade taconite ore deposit.

PUBLIC INPUT OPPORTUNITIES

- Preapplication notices for prospecting and mining
- Mining permit applications, an environmental impact statement, and any other permits required for the proposed project

**Non-ferrous mining.** Also known as sulfide mining, this means mining for metals other than iron. Most known metallic mineral deposits are in northern Wisconsin. 2017 Wisconsin Act 134 marked a major change in how non-ferrous mining is regulated in the state. The Act repealed a requirement that companies demonstrate a mine that had successfully operated for 10 years and another that has been closed and reclaimed for 10 years without polluting the surrounding environment. It also removed mining-specific wetland protections and weakened requirements that ensured money was set aside by a mining company in case of future contamination. Finally, the Act narrowed public input opportunities in the mining permitting process. In 2021, DNR finalized new rules based on this law.

PUBLIC INPUT OPPORTUNITIES

- Preapplication notices for prospecting and mining
- Prospecting and mining permit applications, an environmental impact statement, and any other permits required for the proposed project
- Informational hearing if requested by 5 or more individuals on prospecting or mining plan modifications
- Certificate of completion of reclamation and reclamation bond release

* Licenses for exploratory drilling and bulk sampling do not require a public comment period and hearing. However, DNR is required to provide notice of project applications.

**Federal Regulation**

The Bureau of Land Management generally controls permitting for mining on federal lands such as National Forests. Small exploration proposals can be approved without public input. Rules for more extensive exploration generally allow for public review and input as part of an Environmental Assessment. Mining proposals likely to cause significant impacts require an Environmental Impact Statement (EIS) with public input. Federal and state regulators often collaborate to issue a joint EIS where the state has established mining laws.
In 1975, a battle began over a metallic sulfide ore deposit in northern Wisconsin. Exxon proposed a zinc/copper mine at a site in Forest County near the Mole Lake Reservation and the Wolf River headwaters. A broad coalition of Tribal groups opposed the mine as a violation of their treaty rights. They were joined by environmental and fishing groups seeking to protect the Wolf River and its tributaries. In 2003, the Mole Lake Band of Lake Superior Chippewa and the Forest County Potawatomi purchased the over 5,000-acre mine site, permanently protecting it from mining.

Back 40 Mine

Canadian mine development company Aquila Resources has been seeking to develop a metallic sulfide deposit containing gold, zinc, copper, silver, and lead in the Upper Peninsula of Michigan on the banks of the Menominee River. Such a mine would threaten groundwater, wetlands, and the Menominee River. It would also desecrate irreplaceable cultural resources, including burial mounds of the Menominee Indian Tribe of Wisconsin.

Bend Deposit

The deposit is 3 to 4 million tons of low-grade copper and gold on public land in the Nicolet-Chequamegon National Forest in Taylor County. The Bureau of Land Management (BLM) controls most of the surface and mineral rights, though some are held by private owners. Mining would occur underground due to the shape of the deposit. Gold prices would need to be high to justify development and ore would likely be shipped to the Back 40 site for processing. Aquila held BLM leases until selling its interests to a new company - Green Light Metals - in August 2021.

Crandon Deposit

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WISCONSIN METALLIC MINERAL DEPOSITS

Flambeau Mine
The Flambeau Mine was an open-pit copper/gold mine that was permitted by the Wisconsin Department of Natural Resources and opened in the summer of 1991. The mine operated for about eight years, and then the open pit was backfilled as part of the reclamation process. The mine was closed, and the site reclaimed by the end of 1999. The site is not fully reclaimed due to surface water contamination and runoff issues. The mining company took only a high-grade portion of the ore, leaving several million tons of lower grade ore buried.

Penokee Range Taconite Deposit
In 2013, a Florida-based company called Gogebic Taconite (GTAC) began to develop plans for an iron mine in the Penokee Hills, shortly after the Wisconsin state legislature had loosened environmental regulations on the iron mining industry. However, the project faced swift condemnation from the Bad River Band of Lake Superior Chippewa, who felt it threatened the ecological health of the Bad River watershed and negatively impacted the exercise of their treaty rights to hunt, fish, and gather in ceded territory. In 2015, GTAC withdrew the project application.

Lynne Deposit
The Lynne metallic sulfide deposit in western Oneida County consists primarily of zinc sulfide with significant silver, lead, gold, and copper. The deposit lies beneath a wetland within Oneida County forest land. A previous developer proposed a 65-acre open pit with waste disposal in 210 acres of pits. Treated wastewater was proposed to be dumped into the Willow River or tributaries of the Willow. Voters approved a county-wide non-binding referendum opposing development of Lynne in 2018, and no development has progressed since that time.

Reef Deposit
Reef is a series of small gold deposits very near the surface with less than half a million tons of total ore located east of Wausau in the town of Easton. Open pit mining would be used for extraction, but the deposits are too small to host on-site processing and waste storage. The gold would likely also be shipped to Back 40 for processing. Aquila held leases at Reef with options to purchase until selling its interests to Green Light Metals in August 2021.

Other Sub-Economic Deposits
The discovery of the Flambeau and Crandon deposits led to dozens of companies exploring northern Wisconsin for additional minerals in the 1970 and 80s. So-called economically viable deposits such as Lynne, Bend, and Reef were discovered along with more than a dozen smaller or low-grade deposits. These are all considered sub-economic or not viable for development into mines. They are mostly found in Rusk, Price, Lincoln, Oneida, and Forest Counties. Exploration for additional deposits in recent years had been limited to the areas of the known “economic” deposits until Canadian exploration company Badger Minerals gained permits in 2020. Badger drilled six holes at the small “Wolf River” deposits discovered in Oneida County in the 1970s, but it did not report finding economic minerals and halted exploration. The passage of 2017 Act 134 has made mine permitting easier in Wisconsin and may motivate other companies to explore deposits previously thought uneconomic.