

A Taconite Story: Mining in Northern Wisconsin

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Introduction

In the Great Lakes area, the mining of metallic ores helped to shape the economy and culture of the Midwest. Today, within the Penokee Hills of northern Wisconsin there is a current proposal from a mining company to begin a taconite iron mine. Taconite is a lower grade of iron ore rock that has to be crushed in order for the iron to be extracted. At 21 miles long, over 4 miles wide and over 800 feet deep, the proposed open pit mine would be the largest in the world. The company, Gogebic Taconite LLC (GTac), promises an increase in employment and a reinvigoration of the local economy.

My approach was to first document the mining history of the Great Lakes Area. I then researched the potential costs and benefits of this type of mining in the Penokee Hills at this time in order to determine whether mining here is advisable. To aid in making this decision, I also studied related mining situations to get a better sense of how mining in the past has been dealt with scientifically, socially, and politically.



Photo of the Penokee Hills, the area where GTac wants to mine. Photo take by Joel Austin via <https://wmccoop.files.wordpress.com/2012/11/view-from-the-penokee-hills.jpg>

Taconite Mining Process



• Because taconite is a very hard rock, dynamite is used to blast it into smaller pieces.



• The pieces are scooped up by giant backhoes that can hold over 80 tons of rock.
• They are then transported to the processing plant.



• The rocks get crushed into even smaller pieces and ground in rotating mills with water to create a fine powder.



• The iron ore is separated from the powder using magnetism.
• The waste rock is dumped into tailings basins.



• The wet powder is then rolled in rotating cylinders into marble sized taconite pellets.
• These pellets are heated and cooled, ready to be transported wherever they are needed.

Figure 1: The process of mining taconite, as outlined by the DNR. <http://www.dnr.state.mn.us/education/geology/digging/taconite.html>

Benefits of Mining

The primary benefit from mining taconite is economic gain. GTac has estimated that their operations will provide jobs for as many as 700 people directly through mining—2,000 in surrounding towns—for the expected 35-year lifespan of the proposed mine.

Costs of Mining

At 4 1/2 miles long, .5 miles wide and more than 800 feet deep, the proposed mine would be the largest in the world. Thus, the general environmental costs like deforestation and habitat loss/fragmentation would be exacerbated.

Particular to this area is the presence of six watersheds with an area the size of Rhode Island that would be affected by runoff and pollutants (see Figure 2 below). Also, the massive amounts of sulfide ore that would need to be processed can react with oxygen and water to create carcinogen-heavy acid mine drainage (Figure 3 to the right).

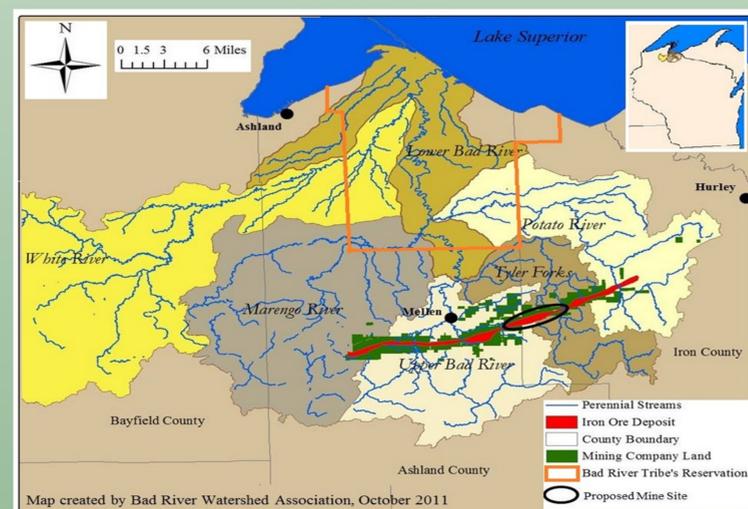


Figure 2: This map shows each watershed that would be affected by the proposed mining operation. Note that the flow of many of these rivers is northward, as the Penokee Hills lay on a ridge. Image via http://urbanmilwaukee.com/wp-content/uploads/2013/04/BRWA_mine_site_in_brw_map.jpg

Discussion

Mining is an extremely sensitive issue politically, with constant lobbying for legislation to rewrite laws and regulations concerning environmental quality standards. This case was particularly controversial: owners of GTac helped fund ads supporting the reelection of (R) Gov. Scott Walker, who in turn let them rewrite laws reducing mining regulations. It also exempted their operations from Wisconsin's established Prove-It-First law which mandates proof that they can safely operate a mine.

It should also be noted that during the research of this topic and thesis writing, GTac abandoned all mining activity in northern Wisconsin, leaving just one employee in their office in Hurley. While this can be seen as a temporary victory for activists, efforts to mine this area are unlikely to completely cease.



Figure 3: Acid mine drainage (AMD) is the result of sulfide-bearing material, such as iron ore, is exposed to water and oxygen. AMD carries heavy metals and other carcinogens through waterways. Image via <http://cdn.physorg.com/newman/gfx/news/ires/2012/bookaboutind.jpg>



Figure 4: Picture of Lake Wazee, in Wisconsin. Lake Wazee is an example of a successful reclamation effort by a mining company to convert their open-pit mine into a lake. Image via <http://www.co.jackson.wis.us/vertical/Sites/%7B4C09F8F2-8A82-4929-9E2A-A836851B00C%7D/uploads/%7B1C3E3E-A9-5072-43B2-84A7-0BA7A093BF47%7D.JPG>

Related Mining Situations

Unsuccessful Mining Operations:	Successful Mining Operations:
Situations where there were significant environmental infractions or lack of cooperation with governing bodies and/or public.	Situations where company cooperated with regulations/permitting process, reclamation efforts were successful, and mine was productive.
Crandon, WI: Exxon Coal and Minerals Company discovered zinc and copper deposits in Forest County. However, since the deposits lay in Ojibwa territory, tribes were able to set higher water quality standards through the Clean Water Act that made mining economically infeasible.	Black River Falls, WI: For 13 years beginning in 1969, 11 million tons of taconite pellets were shipped during the mining of the Seven Mile Mound iron deposit. Of note is the reclamation efforts put forth by the company after operations: the 200 acre mining pit was filled and is now known as Lake Wazee, a popular recreational body of water (See Figure 4 above).
Sevilla, Spain: Bill Williams, current CEO of GTac, is currently being indicted for environmental crimes at a mine owned by Cobre Las Cruces. In Spain, Williams approved the extraction of water from an aquifer reserve to use in mining operations. After refilling the aquifer, the water was found to contain elevated levels of arsenic.	Hibbing MN: The Hull-Rust Mahoning Mine is currently the largest open-pit iron mine in the world. Since its opening in 1895, it has produced over 700 million tons of iron ore, and maintains an annual production of 8 million tons of taconite pellets.



Photo of the Bad River in the Penokee Hills. Photo by JJ Roske

Conclusion

There are an exceptionally high number of likely negative effects on the ecosystem, watersheds, and the local water supply. Even if GTac did meet EPA water quality standards, they would be losing money trying to meet them because taconite is a lower grade iron and requires increased labor and improved technology to extract the iron from the rock. Therefore, based on the examination of the costs and benefits of mining in this particular area along with the study of related cases, the mining of taconite iron in northern Wisconsin is inadvisable at this time.