



ACID MINE DRAINAGE AND THE GOGEBIC TACONITE MINE



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What is acid mine drainage?

Acid mine drainage is the flow of acidic water from mine sites. It is one of the largest environmental problems facing the U.S. mining industry.

What causes acid mine drainage?

It occurs when sulfur-containing ore or waste rock is exposed to the environment. The sulfur in this rock reacts with water and oxygen to release the hydrogen ions that lower pH.

Is it true that taconite mines don't produce acid mine drainage?

Unfortunately not; no type of mine is immune to acid mine drainage. Things like the waste rock removed as part of the mining process can contain acid mine drainage causing material, even if the ore body itself doesn't contain sulfides.

How much acid mine drainage will result from the proposed GTAC mine?

It's impossible to determine the extent of acid mine drainage that will occur without significant research and testing into the composition of the rock that will be disturbed.

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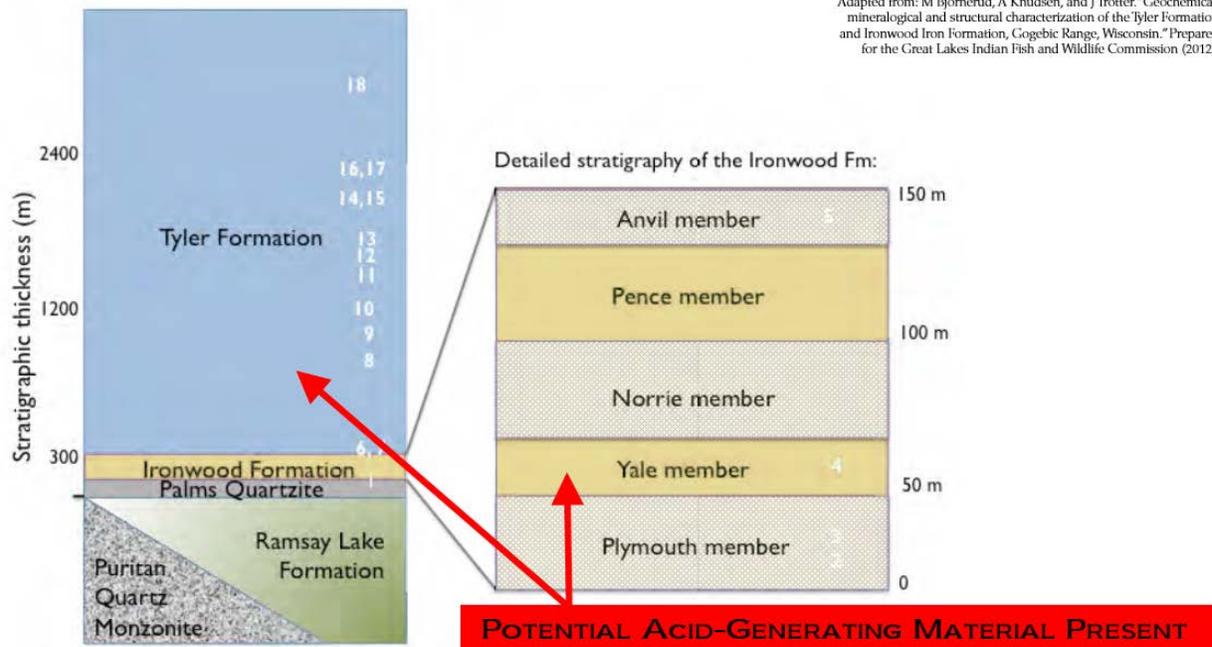
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What does acid mine drainage do?

- Flows outward from mine sites, acidifying surrounding water and soils
- Increases leaching of metals like toxic arsenic and cadmium
- Kills wildlife that can't live in acidic or contaminated conditions

Acid Generating Material around Ironwood Iron Formation

Adapted from: M Bjornerud, A Knudsen, and J Trotter. "Geochemical, mineralogical and structural characterization of the Tyler Formation and Ironwood Iron Formation, Gogebic Range, Wisconsin." Prepared for the Great Lakes Indian Fish and Wildlife Commission (2012).



The Tyler formation overlying the Ironwood Iron formation, and the Yale member of the Ironwood Iron formation, contain sulfide materials such as black pyritic shale and slate.

Mining into the Ironwood formation would expose Acid Mine Drainage generating rock from the surrounding area.

Are there examples of taconite mines causing acid mine drainage?

Yes. The Dunka taconite mine in Minnesota is noted among others where “the potential to generate acid was either not considered or not expected but later developed” by the U.S. Environmental Protection Agency.¹

At the Dunka site, samples from waste rock stockpiles had pH values as low as 5.0. This is 100 times as acidic as distilled water – about halfway between water and vinegar.

Could this happen around the Gogebic Iron Range?

Yes. The U.S. Geologic Survey has identified a number of pyritic shale containing groups (material that can cause acid mine drainage) in and around the iron formation.²

Sources:

1. U.S. Environmental Protection Agency, “Technical Document: Acid Mine Drainage Prediction.” EPA 530-R-94-036 (1994).
2. W. Cannon et al, “The Gogebic Iron Range—A Sample of the Northern Margin of the Penokean Fold and Thrust Belt.” U.S. Geological Survey Professional Paper 1730 (2007).

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