

**NOTE:**

All mine related information is taken from the publically available TALON PEA ([https://talonmetals.com/wp-content/uploads/2021/02/Talon-Tamarack-PEA3\\_2021.pdf](https://talonmetals.com/wp-content/uploads/2021/02/Talon-Tamarack-PEA3_2021.pdf)) and ([https://talonmetals.com/wp-content/uploads/2022/11/Final\\_NI43101\\_Report\\_Talon\\_TamarackN\\_20221102.pdf](https://talonmetals.com/wp-content/uploads/2022/11/Final_NI43101_Report_Talon_TamarackN_20221102.pdf))

# Tamarack Water Alliance

## Meeting with MN Climate and Health Program (12/5/22)

<https://tamarackwateralliance.org/>

- **About the Proposed Tamarack High Sulfide Mine**
- **Key Concerns**
- **Respecting 1855 Treaty Rights**

# The Proposed Tamarack Mine

---

- ❖ Talon Metals is a mineral exploration and marketing company registered in the British Virgin Islands with offices in Toronto Canada and Tamarack MN.
  - The Tamarack Project is currently 51% owned by Talon Metals Corp. (Talon), and the remaining owned by Kennecott Exploration Company (Kennecott / Rio Tinto) and is operated by Talon.
  - Located in a wetland area, in the 1855 and 1854 treaty territory / Anishinaabe lands, near Minnewawa and Big Sandy Lake... Mississippi and Kettle Rivers (St. Croix)
- ❖ Talon plans to build an underground high sulfide nickel-copper mine in coming years
  - Talon told us they plan to start the permitting process in early 2023
- ❖ This NOT an iron mine! Nickel-Copper-Cobalt minerals are bonded to sulfur mined as sulfide ores
  - When these ores are exposed to air and moisture, a chemical reaction occurs that generates sulfuric acid that migrates into the surrounding environment and, through leaching, releases heavy metals present in the waste rock, pit walls, and tailings basins of mining operations.
  - Tamarack sulfide deposits (and tailings) also contain cobalt and other highly toxic minerals
  - The sulfuric acid along with dissolved heavy metals released onto the land will seep into the rich aquifers below and then into streams and lakes at levels that are toxic to fish and other aquatic life
  - The close proximity of sulfide mines to valued water bodies such as lakes and rivers of the Mississippi watershed intensifies the magnitude of this issue
  - All of the water bodies in the Tamarack area are linked by multiple aquifers.

# Documented Health Risks of Sulfide Mining in Minnesota

## ❖ Sulfide Mining and Human Health in Minnesota

- [https://pubs.royle.com/publication/?i=352462&article\\_id=2624726&view=articleBrowser](https://pubs.royle.com/publication/?i=352462&article_id=2624726&view=articleBrowser)

## ❖ Risks and costs to human health of sulfide-ore mining near the Boundary Waters Canoe Area Wilderness

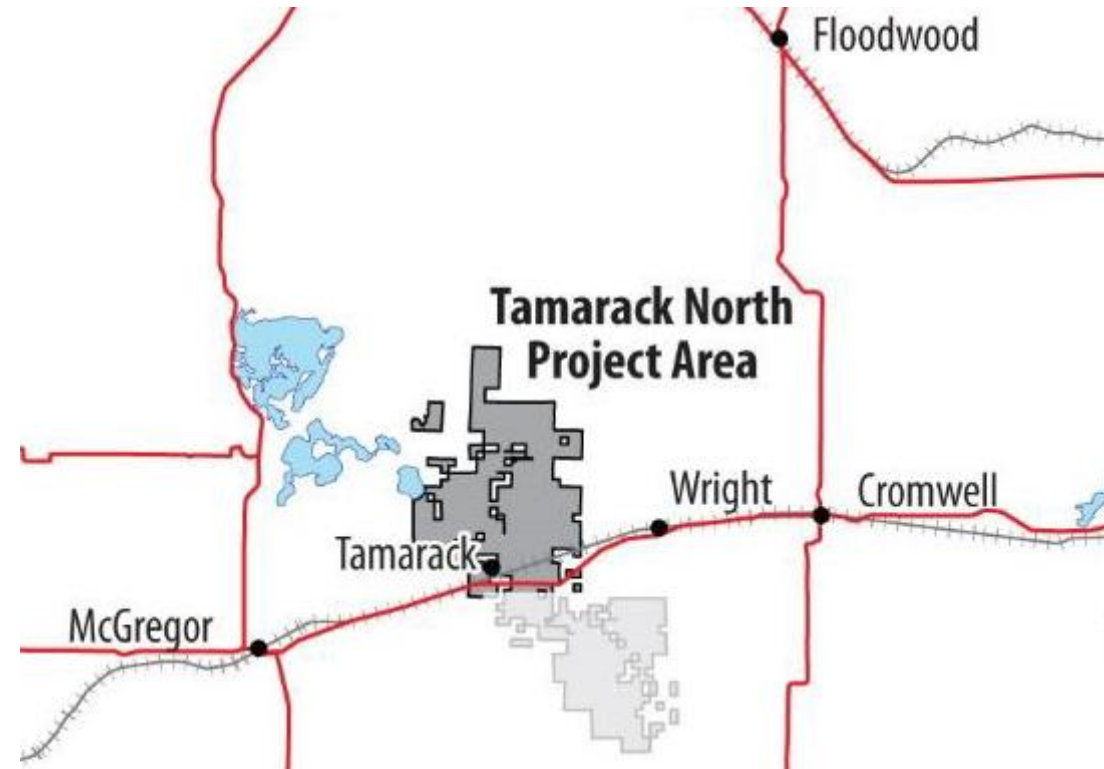
- <https://www.tandfonline.com/doi/abs/10.1080/10807039.2019.1576026>

## ❖ Sulfide-ore mining AND human health in Minnesota - WHERE ARE WE NOW?

- <https://www.savetheboundarywaters.org/sites/default/files/resource-file/MNMedicine2022.pdf>

# Proposed Tamarack High Sulfide Nickel-Copper Mine

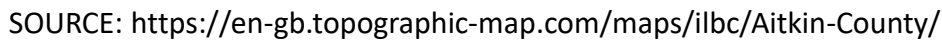
- ❖ The Tamarack North Project covers approximately 20,348 acres - Nearly **32 square miles!**
  - With plans to mine between 9-17 million tonnes of ore over an 12+ year period (page 1-7 of the 2022 PEA)
  - 8.564 million tonnes of “indicated” resource / ore
  - 8.461 million tonnes “inferred” resource / ore
- ❖ Concerns based on Talon’s Preliminary Economic Analysis – an NI 43-101 Technical Report:
  - Vented airborne dust from blasting and operations is contaminated with sulfide particles
  - Talon must pump up to 2.6 million gallons a day from the mine due water entering from the aquifers and service water used in operations – Discharge of potentially contaminated water as well as aquifer levels are of concern
  - Mine site includes temporary ore and development rock storage which should be lined - Liners and covers will eventually leak contaminating the area
  - Impact of blasting on human health (mental and physical)



- **Indicated Resources** are resources which have a high certainty of being there but are somewhat less reliable than measured resources as drill hole spacing is much greater than for measured resources.
- **Inferred resources** are not based on any drill hole campaign and are an educated guess often relying on seismic data and an understanding of the geology of the area. The market gives little to no value to inferred resources



\_\_\_\_\_



This is populated area – what is the impact of blasting on the mental health of the community?



# Concerns - Air

- ❖ Vented airborne dust from blasting and operations is contaminated with sulfide particles as well as many other toxic minerals – Eagle Mine monitors for at least 33 toxic substances
  - “Operations” includes the loading of ore in train cars to shipped to Mercer County in North Dakota for processing
- ❖ No provision in the Talon PEA to address airborne contamination
- ❖ Michigan Eagle Mine does a very poor job at managing dust – a possible cause of the water contamination demonstrated in the Eagle Mine Exception report
  - After including an air filtration system in its original permit, Eagle sought to have it removed in 2013, which the MDEQ approved, blowing a plume of unfiltered mine emissions out over the Salmon Trout River and the Yellow Dog Plains. No stack monitoring is taking place, and the emissions have not been measured since September 2014, before the mine was in full operation.  
Source: Mining Action Group <http://savethewildup.org/about/eagle-mine-facts/>
  - <http://savethewildup.org/2013/03/air-filtration-necessary-on-eagle-mine-air-stack-to-keep-air-clean/>



Mining dust has saturated and stained the Flags on the Eagle Mine bulletin board.

**Michigan Eagle Mine report:**

[https://www.eaglemine.com/\\_files/ugd/145c36\\_9fc08b466c944ef8a22dd0a5c5ff9642.pdf](https://www.eaglemine.com/_files/ugd/145c36_9fc08b466c944ef8a22dd0a5c5ff9642.pdf)

# Concerns - Water

---

- ❖ Talon must pump up to 2.6 million gallons a day from the mine due water entering from the aquifers and service water used in operations
  - No provision for water filtering in the Talon PEA
  - Aquifer levels are of concern (impacting well levels as well as wetland and lake levels)
  - Pumping requirements may actually be **substantially higher** since Talon had planned to fill mined out stopes with a cement paste made with tailings ... but tailings are no longer available since ore processing has been moved to North Dakota
- ❖ At Eagle Mine monitor point QAL023B, the mean water level readings from 10/2019 – 9/2020 were a maximum of **1.7 feet (ft) below the calculated minimum background baseline level**
  - The document also notes that water levels have generally increased since the baseline was set
  - Mine attributed this drop in water levels to pumping of the mine services well and groundwater infiltration into the mine
  - This drop in water levels is then due to an average pumping requirement of 80,000 to 150,000 gallons a day – what happens at the Talon Tamarack site where it's estimated that 2,600,000 gallons might be pumped per day ... **approximately 20 times more than Eagle Mine**
- ❖ Water levels at many of the wetland monitoring locations fell up to six inches below pre-mining baseline levels in face of the fact that regionally, the overall water levels have been increasing since the fall of 2013 with many monitoring locations near record high levels in 2020.
- ❖ Eagle mine listed at least **17 monitoring events that show levels of pollution and water chemistry changes** outside the planned benchmark range – some with sulfate levels that exceed MN wild rice standards by x1500

# Concerns – Ore/Rock Storage

---

- ❖ Tamarack Talon Mine site will include temporary development rock storage and ore storage
  - Liners and covers will eventually leak contaminating the area
  
- ❖ At Eagle Mine TDRSA (Temporary Development Rock Storage Area) is lined with both a primary and secondary lining
  - A leak detection system is installed between the liners to monitor primary lining integrity
  - A total of approximately 55 gallons of water was purged from the leak detection sump in 2020, a larger volume than 2019.
  - Thus we see that the lining system does leak after only a few years of operation
  - **The leak levels are currently very small at this point but as noted in the document, increasing slightly over time.**