



Water Quality

The area encompassing the proposed NorthMet Mining Project (mine, transportation and utility corridor, processing plant, and tailings basin) is located in northeastern Minnesota near the Partridge and Embarrass rivers, which flow into the St. Louis River and, ultimately, Lake Superior. The project would not affect the Boundary Waters Canoe Area Wilderness. Models were developed to help analyze potential effects on water quality and develop measures to avoid or minimize the effects. The U.S. Environmental Protection Agency has delegated authority to issue air permits, such as those required for the NorthMet Mining Project, to the Minnesota Pollution Control Agency.

How could the NorthMet Mining Project affect water quality?

Natural waters contain elements that reflect the area's geologic setting, land cover, and biological activity. Left uncontrolled, the proposed project has the potential to elevate three types of constituents:

- Sulfate could be released during the chemical reactions of minerals in the waste rock, exposed pit wall, and tailings.
- Metals including copper, cobalt, and nickel, could be released as part of the chemical reactions of minerals in waste rock, exposed pit wall, and tailings. These metals occur naturally as a result of local geology, but elevated values could affect water-based organisms, even at relatively low concentrations.
- Mercury could be present in very small amounts in ore and waste rock.

How were the effects determined?

The potential effects of the NorthMet project on water in the area were modeled using three computer models and a comparison to an existing mine pit that has historical data. Many of the water quality constituents naturally vary with seasonal flows and other conditions. The models estimated the likely effects of the project on water quality in the area, taking into account the natural variability and uncertainty around many of the model input assumptions.

What did the modeling predict would be the effect on water quality?

Based on a 90 percent probability, the modeling predicted that no pollutants would cause an exceedance or increase an existing exceedance of the established water quality evaluation criteria, with the exception of aluminum and lead. Levels of aluminum and lead would increase in waters north of the tailings basin, in the Embarrass River watershed, as a side effect of the NorthMet Project and not as a result of discharges or releases from the project area itself. Other pollutants, such as sulfate and mercury, would be reduced overall from existing conditions as a result of the proposed project. Both wastewater treatment facilities will meet the wild rice sulfate standard.

What would be done to avoid or minimize these effects?

During operations, PolyMet would implement a variety of measures to protect waters in the area, such as:

- Wastewater treatment to remove pollutants, including reverse osmosis for sulfate, at the mine site and the plant site for as long as needed to meet any permit requirements.
- Advanced liner systems for the temporary waste rock stockpiles and the hydrometallurgical residue facility, to capture precipitation that falls on the stockpiles preventing it from moving into surface and groundwater.
- Groundwater containment systems at the permanent waste rock stockpile and tailings basin to control and direct captured water to the wastewater treatment facilities.
- Underwater disposal of the most reactive waste rock to limit reactivity.
- Treatment and reuse of process wastewater to reduce water consumption needs.
- Installation of a bentonite cap for the tailings basin and an engineered geo-membrane cover system for the least reactive rock stockpile.

Additionally, PolyMet would monitor water quality during operations, reclamation, and closure at water discharge points and downstream. This information would be used to understand the actual effects, improve predictions of future effects, and inform possible mitigation measures, including adaptive management, which could be used to prevent environmental impacts. Financial assurance could be set aside to ensure funding of these activities.

For more information about how water quality in the area would be affected by the NorthMet Mining Project and Land Exchange, see the Executive Summary, Sections 4.2.2 and 4.3.2 (Affected Environment, Water Resources), Sections 5.2.2 and 5.3.2 (Environmental Consequences, Water Resources), and Chapter 6 (Cumulative Effects) of the SDEIS. Also, refer to additional Fact Sheets about the NorthMet Mining Project and Land Exchange SDEIS:

1. **What is the Environmental Review Process?**
2. **Effective Commenting**
3. **A Guide to the SDEIS Document**
4. **What's Changed Since the DEIS?**
5. **Project & Land Exchange Overview**
6. **Land Exchange**
7. **Reclamation and Financial Assurance**
8. **Water Quality**
9. **Wetlands**
10. **Air Quality**
11. **Wild Rice**
12. **Mercury**
13. **Threatened & Endangered Species**
14. **Cumulative Effects**
15. **Cultural Resources**
16. **Water Quantity**