

## **CASE STUDY**

# **Gribbons Basin Site Marquette County, Michigan**

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**Prepared by  
The Interstate Technology & Regulatory Council  
Mining Waste Team**

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# GRIBBONS BASIN SITE, MARQUETTE COUNTY, MICHIGAN

## 1. SITE INFORMATION

### 1.1 Contacts

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### 1.2 Name, Location, and Description

The Gribbons Tailings Basin is a tailing basin and waste rock pile from open-pit iron mining. The site receives waste from Empire and Tilden mining facilities in the Marquette Iron Range near the town of Palmer, Michigan. The Empire Mine has operated since 1963, while the Tilden Mine began operations in 1974.

The water used for processing the iron-bearing material through the concentrating process also carries the tailings to a large impoundment known as a “tailings basin.” At the Gribbons Basin, which serves the Tilden Mine, the water is decanted and clarified so it can be returned to the watershed meeting all government clean water standards.

The Gribbons North Basin tailings disposal system consists of 14 tailings discharge points, a tailings beach, a water pond, a decant structure/surface water discharge system, and a 22,500-foot dike system. Tailings are added to the Basin at a rate of approximately 12 million long tons per year. The construction of the Gribbons South Basin expansion doubles the size of the tailings disposal system, adding nine tailings discharge points, a second tailings beach, water pond, and decant structure/surface water discharge system and a second 25,500-foot dike system.

The affected media associated with this site are soil and surface water, with fugitive dust being the primary concern. The overall goals of the remedial actions are the minimization of erosion and protection of water resources. The site cleanup goals are based on this mitigation of ecological risk.

## 2. REMEDIAL ACTION AND TECHNOLOGIES

The site is regulated under the Surface Mining Control and Reclamation Act (SMCRA). However, the facility is active, and site reclamation is not required until closure. Currently, composted municipal solid waste and paper mill sludge are applied to the tailings to supply organic matter and establish vegetation. The goal is to establish cost-effective reclamation to minimize long-term liability.

### **3. PERFORMANCE**

Effectiveness of the caps and covers is evaluated with regular water sampling. The sludge application is active but has developed selenium issues. Composted municipal solid waste application is a proposed project that has pending regulatory review.

### **4. COSTS**

The primary cost associated with the remediation at this site is for operation and maintenance: \$0.50 per square yard of surface. Transportation of materials to the site is the primary expense; application varies with materials. Materials are processed waste being put to beneficial use.

### **5. REGULATORY CHALLENGES**

There are regulatory issues associated with this new technology, since Michigan currently has no standards for the use of composted solid waste.

### **6. STAKEHOLDER CHALLENGES**

None reported.

### **7. OTHER CHALLENGES AND LESSONS LEARNED**

The need for communication regarding project goals and standards is absolutely critical. The interpretation of test results and the scope of testing must be clearly defined and embraced by the regulatory agency, the mine operator, and the material supplier. The use of former waste products reduces cost but requires a higher level of monitoring of incoming materials and site dynamics.

### **8. REFERENCES**

Milner, M. P., General Manager, Tilden Mining Company L.C. to W. A. Dellies, Air Quality Division, Michigan Department of Environmental Quality. Letter dated December 23, 1998. Subject: Tilden Mining Company L.C. Dust Abatement Program.