

Mining Information Sheet

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Reclamation and Long-Term Care Requirements for Metallic Mining Sites in Wisconsin

Introduction

The Department of Natural Resources is the primary state agency authorized by the legislature to regulate metallic mineral mining in Wisconsin. Metallic mineral mining includes the mining of ores of iron, copper, lead and zinc along with the precious metals silver and gold. A company must obtain a mining permit, along with other permits, approvals and licenses, from the Department before beginning to mine metallic minerals. A very important component of the mining permit is the reclamation plan. The reclamation plan, once approved, becomes part of the mining permit.

This information sheet describes the requirements for a reclamation plan and explains its role in protecting the environment during and after mining. In addition, it describes the responsibilities of the mining company for the long-term care of the entire mining site including any waste disposal facilities that may exist.

Mine Reclamation

Successful reclamation means the restoration of all areas disturbed by mining activities including aspects of the mine itself, waste disposal areas, buildings, roads and utility corridors. It is the product of thorough planning and execution of a well conceived reclamation plan. Restoration means returning of the site to a condition that minimizes erosion and sedimentation, supports productive and diverse plant and animal communities and allows for the desired post-mining land use.

To better understand how the reclamation plan functions to achieve the goal of revegetation, it is helpful to provide a brief overview of state law and how it relates to successful reclamation.

There are several **minimum standards** for reclamation that guide the development of a company's reclamation plan. These standards are:

- 1) Topsoil from the areas disturbed by mining must be salvaged and either stockpiled or used in on-going reclamation or stockpiled for use in final reclamation.
- 2) Disturbed areas must be revegetated or otherwise stabilized as soon as possible after disturbance.

- 3) Native species of vegetation are required for final reclamation unless this is shown to be impossible or undesirable.
- 4) All toxic and hazardous wastes, refuse and mine tailings must be safely disposed.
- 5) Surface structures must be removed unless they are converted to a beneficial function in accordance with the approved post-mining land use.
- 6) Tunnels, shafts or underground openings must be sealed.
- 7) Measures must be taken to prevent subsidence. If subsidence occurs, corrective actions must be taken.

In order for reclamation to be considered successful, the following **environmental protection goals** must be met:

- 1) Ensure that surface water quality is maintained by designing erosion and sedimentation control systems.
- 2) Protect the surface water from non-point sources of pollution and sedimentation.
- 3) Ensure that vegetative cover is established and that it functions to promote soil conservation, site stabilization and enhances the infiltration of precipitation into the soil (helps to restore the local hydrologic balance).
- 4) Protect against slope failures on steep slopes by incorporating additional stabilization measures in those areas.
- 5) Control wind erosion and thereby air pollution which might otherwise result from fugitive dust.
- 6) Promote species diversity in plant, insects and wildlife in accord with the goal of reestablishing native communities.

The Reclamation Plan

The reclamation plan is a detailed technical document designed to meet the goals which lead to successful reclamation. In order to better understand how the reclamation plan is developed and how it functions to achieve the goals of reclamation, a more complete summary follows:

Pre-mining Planning Phase - An applicant for a mining permit must prepare a reclamation plan for review by the Department and the public. The goal of this reclamation plan is to achieve successful reclamation of the site disturbed by mining. In addition, the plan addresses the proposed final land use and the relationship of the reclaimed mine site to the surrounding local land use. The responsibility of the Department is to ensure that the plan would comply with the law and protect

the environment.

Selection of Plants to be Used in Site Revegetation - The key to ensuring that the site is returned to a condition that is capable of supporting the approved post-mining land use is successful revegetation. It is also important to select species that are compatible with the approved post-mining land use. For example, if the goal is to provide wildlife habitat, then the seed mix is selected to provide good browse and cover. In general, the seed mix used for reclamation will consist of native species that are ecologically suited to the area.

Revegetation And Site Stabilization Activities During Mining - During the construction and the mining phase of a project, erosion control and site stabilization are of primary importance. State law requires that areas disturbed by mining must be revegetated and stabilized as soon as practicable. The erosion control system is installed prior to and concurrently with construction activities and would be maintained during the life of the mine to protect surface water.

To control erosion it is necessary to minimize the surface water that contacts the disturbed area by diverting the water around the disturbed area when possible. Next, to address the runoff that results from direct precipitation on the disturbed area, measures must be taken to lessen its erosive potential and to collect it for treatment prior to its discharge to surface water courses.

Treatment of runoff containing sediment is usually accomplished by detention in a sediment pond to allow for the settling of solids.

In addition to revegetation, numerous other stabilization measures are employed at the disturbed area to control surface water runoff and minimize erosion and sedimentation. These include the use of mulch, erosion control blankets, tackifiers (binders used to hold mulch in place), rip-rap, slope control and many others.

Final Site Reclamation - Once a mining operation is completed, all surface structures are removed and underground openings (if any) are sealed, unless other uses for the structures are deemed appropriate. Next, any impermeable caps or cover layers are installed if needed. The site is then graded both to achieve the designated contour and to prepare the site for the redistribution of the topsoil that has been stockpiled.

After final grading has been accomplished to approximate the pre-mining landscape condition, the topsoil and in some cases the subsoil is/are redistributed at the thickness necessary to facilitate revegetation. The results of a soil analysis are used to prescribe the proper rate of fertilizer application.

In addition to commercial fertilizer, soil amendments such as manure, sludge, or compost may be applied to further enhance the soil and facilitate plant establishment.

The application of mulch is often required in order to conserve moisture, suppress weed growth and keep soil temperature at a level conducive for plant growth.

Bonding and Bond Release

After a mining company has received approval of its mining permit application, but before mine construction or mining begins, the operator must file a performance bond, or the equivalent. The purpose of this guarantee is to ensure that the state has the financial resources to complete the reclamation activities contained in the reclamation plan in the unlikely event that the company fails to do so. The reclamation plan is used as the basis for calculating the estimated cost of reclamation. This cost is reflected in the bond provided to the state by the mining company. Annually thereafter, the Department reviews the mining and reclamation plans and may change the amount of the bond posted to cover the estimated reclamation costs if they have changed.

When mining has been completed and the reclamation of the site is finished, the company will notify the Department. A minimum of four years after the Department concurs that reclamation is complete, the operator may petition the Department to issue a certificate of completion of reclamation for the site and reduce the amount of the bond. After a public hearing, the Department must issue a certificate of completion if it finds that the operator has successfully completed site reclamation. The main criteria used to evaluate reclamation success are cover, productivity, and diversity.

Good **cover** allows the vegetation to protect the soil against the impact of rainfall and protect the soil against runoff, thus minimizing erosion and sedimentation.

Productivity is used as a measure to ensure that plant regrowth is acceptable and sustainable.

Diversity can be used to evaluate the stability and vigor of the plant community.

Additional monitoring activities may include periodically evaluating the system used to isolate potentially deleterious materials such as mining waste from the environment.

For at least the next 20 years the operator must continue to monitor and maintain the mining site. After that time, if the operator has met the environmental protection goals stated in their reclamation plan, the Department must release the remaining portion of the bond.

Maintenance, Monitoring and Management

There is a need to evaluate the success of the revegetation program after plants are established to ensure the reclamation is proceeding as planned. Monitoring of revegetation success and the effectiveness of systems designed to protect surface or groundwater and provide erosion control occurs during the active mining phase and continues after the mining company notifies the Department of completion of its reclamation activities.

Should monitoring reveal that any systems designed to protect the environment are not functioning properly or that the revegetation is not completely satisfactory, corrective maintenance would be performed by the mining company.

Long-term management is critical during the post mining period and before the bond is released. The management must be ecologically sound and correspond to the designated post-mining land

use. Thus, the effect of state regulations, as implemented by the reclamation plan, is to ensure that the local environmental and socioeconomic needs are met.

Long-term Care of the Mining Waste Site

Many mining operations would include mining waste disposal facilities. The operator/owner of mining waste disposal facilities is required to provide and maintain proof of financial responsibility (such as a bond or other financial security) for long term care of the waste facility. Following closure, the operator/owner is required to maintain the waste facility and periodically monitor the site as well as the local environment to assure that no problems are developing. The monitoring plan, approved during the permitting process, would identify the types of monitoring required from before mining started, during operations and throughout the long-term care period. After a minimum of 40 years following closure, the owner may petition the Department to terminate the owner's obligation to maintain proof of financial responsibility. However, the landowner's responsibility for long term care activities at the mine waste disposal facility **does not end**.

In addition, at the time of the mine permit application, the owner is required to submit a proposal for an Irrevocable Trust Agreement. This proposal will be evaluated for levels of funding, methods of investment and payment schedules at the time of the Master Hearing. These requirements will be then determined and incorporated into the Mine Permit. This Irrevocable Trust Agreement will designate the Department as the sole beneficiary and only the Department could authorize withdrawals from this Trust Fund. The Irrevocable Trust fund will be for perpetuity and all interest accumulated by the fund will be incorporated into the account.

The purpose of the Irrevocable Trust Fund is to ensure adequate financial funding is available to pay for remedial activities taken to mitigate any hazardous substance release from the mine after closure, repair failures to the mine waste disposal facility and repair components at the Mine Waste Disposal Facility after financial responsibility obligations and bonding requirements of the owner are released. The Irrevocable Trust fund has been created to pay for any costs for long term care of the mine site in perpetuity.

Reclamation Violations

If the Department finds a violation of law or a deviation from the approved reclamation plan, it must issue the mine operator an order requiring compliance. If an operator fails to comply with the Department's order, the Department must cancel the mining permit held by the operator. In a case where the reclamation of the mine site is not proceeding as specified in the reclamation plan the Department must order compliance within a certain period of time. If the operator still has not corrected the problem the Department must reclaim the mine site using the money that was held as a bond. The operator is liable to the state for the full cost of reclamation.

For More Information

Reclamation and long-term care requirements associated with mining are spelled out in more detail in Wisconsin Administrative Codes Chapter NR 132, Mineral Metallic Mining, and Chapter NR 182, Regulation of Metallic Mining Wastes. Reclamation requirements also have been established for mineral exploration (see Chapter NR 130, Metallic Mineral Exploration) and prospecting (see Chapter NR 131, Metallic Mining Prospecting).

A reclamation plan was prepared by the Flambeau Mining Company for its project near Ladysmith, Wisconsin. During the review of that project, the Department proposed numerous conditions of approval for the plan, which were subsequently approved in the written decision on the project. This reclamation plan and the approval conditions are in Department files and are available for public review. Reclamation of the pit began in early 1997 and was completed in late 1998. Additional details are described at the Department's Web page: <http://www.dnr.state.wi.us/org/aw/wm/mining/metallic/flambeau/>

If you would like additional information or want to discuss any mining-related issues, please contact:

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This mining information sheet is one in a series prepared by the Department of Natural Resources to explain how metallic mining in Wisconsin is regulated and to explore other aspects of mining. Copies of the following mining information sheets are available from Department offices in Madison and Rhineland, and the Internet:

- *The Permitting Process for a Metallic Mineral Mine*
- *How the Department of Natural Resources Regulates Metallic Mining*
- *Protecting Groundwater at Metallic Mining Sites*
- *Reclamation and Long-Term Care Requirements for Metallic Mining Sites in Wisconsin*
- *Local Decisions in Metallic Mining Projects*
- *Addressing Public Concerns With Wisconsin's Laws Governing Metallic Mining*
- *Wisconsin's Net Proceeds Tax on Metallic Mining and Distribution of Funds to Municipalities*
- *Cumulative Impacts of Metallic Mining Development in Northern Wisconsin*
- *Potential Metallic Mining Development in Northern Wisconsin*

The Mining Regulations (Administrative Code) can be viewed at the Department's Mining Web site:

<http://www.dnr.state.wi.us/org/aw/wm/mining/metallic/index.htm>.