Coal Mining & Reclamation

- The Public Service Commission is the agency responsible for regulating surface coal mining in North Dakota
- 4 large and 2 small surface mines produce about 28 million tons of lignite per year
- Most of the lignite is used for mine-mouth power plants and a coal gasification facility

Freedom Mine

Large dragline removing overburden

Beulah Mine

Dragline uncovering the lower coal seam in a multi-seam mine pit

N.D. Reclamation Law History

- North Dakota's first reclamation law was enacted in 1969
- Law changes in 1973 required saving up to 2 feet of topsoil
- 1975 changes required saving up to 5 feet of topsoil and subsoil and restoring the pre-mine level of productivity
- Federal Surface Mining Control and Reclamation Act (SMCRA) was enacted in 1977 and it created the federal Office of Surface Mining (OSM) within the Department of the Interior
- North Dakota's current law was passed in 1979

SMCRA – Federal Reclamation Law

- Sets minimum standards for coal mine reclamation across the United States
- Includes an abandoned mine land reclamation program that is funded by a coal mining fee
- Allows OSM to approve state programs that are at least as stringent as standards in SMCRA
- North Dakota's program was approved in 1980

Permitting Requirements

- **Extensive pre-mine planning and data collection is required**
- **Detailed mining permit applications must include:**

✓ **Business Entity and Legal Information**

✓ **Baseline Environmental Resource Information**

✓ **Detailed Mining and Water Management Plans**

✓ **Reclamation and Monitoring Plans**

✓ **Performance Bond**

Business Entity\Right to Mine\Legal

- Business owners, officers and directors
- Identify other coal mines in the United States and any recent violations
- Copies of documents showing the right to mines, i.e. leases, easements and deeds
- Notices that inform interested persons of their right to file comments or request an informal conference on the application

Pre-mine Baseline Information

- Land Use and Vegetation Information
- Detailed Soil Survey
- Surface and Ground Water Resources
- Geologic and Topographic Information
- Cultural Resources
- Wildlife Surveys
- Information on Manmade Features

Mining and Operations Plans

- Soil removal and storage plans
- Surface water management plans
- Haul roads and other transportation plans
- Detailed pit layout and extended mining plans
- Plans for the use of explosives
- Plans for disposing mine wastes
- Air pollution control plans
- Plans for re-locating any public roads

Aerial view of the three mile long mine pit area at the Center Mine
Reclaimed lands on the left side of the photo and undisturbed lands on the right side

Topsoil removal with a twin-engine tractor scraper at the Center Mine

Dragline removing overburden at the Falkirk Mine

Reclamation and Monitoring Plans

- Postmining land use, including landowner preferences
- Grading and post-mining topographic plans
- Topsoil and subsoil replacement plans
- Seeding and management plans
- Plans for removing long-term facilities & structures
- Vegetation monitoring and yield measurements
- Surface and ground water monitoring
- Wildlife monitoring
- Reclamation cost estimate for setting bond amount

Subsoil being respread on graded mine spoils at the Freedom Mine

Recently respread topsoil and subsoil at the Center Mine

Tillage and rock picking on reclaimed land at the Freedom Mine before it is mulched with straw and seeded

Performance Bonds

- Surety, collateral or self bonds must be provided before an application is approved
- Bond amount must cover the worst-case mining and reclamation condition
- Periodic updates are required
- Final bond release cannot be granted until at least 10 years after reclaimed areas are seeded
- In the event of forfeiture, the bond money will be used to have a contractor reclaim the disturbed lands

Reclamation Standards

- Minimize adverse impacts off the permit area
- Return mined land to the pre-mine or higher land uses
- Re-contour mined land to ensure that postmining slopes do not exceed those present before mining and blend in with surrounding land or the approximate original contour
- Redistribute all the topsoil and a sufficient amount of subsoil that has been saved
- Restore the productivity of reclaimed agricultural lands
- Replace any water supplies adversely affected by mining

Reclaimed hayland and wetland at the Center Mine

Barley being harvested on reclaimed land at the Center Mine with a field shelterbelt also planted on reclaimed land in the background

Reclaimed native grassland in the foreground and reclaimed cropland in the background at the Freedom Mine

Reclamation Division inspector holding a tray with a soil core when checking respread topsoil and subsoil thicknesses at the Falkirk Mine

Success Standards

- Pre-mine soil surveys are used to establish the target yield level that must be achieved to prove reclamation success
- Actual yield measurements must be taken near the end of the minimum 10-year revegetation liability period
- Plant ground cover and diversity standards must also be achieved for reclaimed native grasslands
- Certain stocking rates must be met for tree and shrub plantings
- Demonstrate that there were no adverse impacts to the hydrologic balance in the area

Reclamation Challenges

- Promptly stabilizing topsoil after replacement
- Soil compaction, especially in the subsoil
- Settling features can develop after lands are reclaimed
- Invasion of undesirable species in reclaimed native grasslands

Deep ripping reclaimed cropland to help alleviate subsoil compaction

SAVE and PROTECT the SOIL