

# You should know...



North Dakota Public Service Commission

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North Dakota Public  
Service Commission

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## Coal Mining and Reclamation

North Dakota has a great deal of low-grade coal known as lignite underlying the western half of the State. These deposits continue across the border into the Canadian Provinces of Saskatchewan and Alberta. The lignite occurs in seams or layers, generally parallel to the surface of the earth. Seams are found as deep as 1,200 feet beneath the surface and range in thickness from a few inches to 40 feet, though most are from 3 to 15 feet thick.

Lignite was first mined in North Dakota by underground methods. This was dangerous and not very profitable because underground mining recovered only a small amount of the coal. A lot of it had to be left in place to support the roof of the underground room created by the miners as they removed more and more coal. This type of mining was gradually replaced by the safer and more economical method of mining called surface mining, and all lignite mined in this State since 1960 has been recovered by this method.

Surface mining (also called strip mining) is basically a large-scale earthmoving operation, although a very complicated one. Before 1970 the surface mining operators in North Dakota did not have to reclaim the land but simply mined the coal and moved their equipment to another location to start another mine, leaving behind them land unfit for any reasonable use.

Since 1970, land reclamation following mining is required by law and so it is now an integral part of the mining operation. A great deal of planning and engineering go into the process to make sure that (1) impacts on the environment will be held to a minimum while mining is going on and (2) the land can be returned to its premining uses after mining is completed.

Here are the basic elements of the surface mining process:

- After all the planning and engineering are accomplished and the mining permit application has been reviewed and approved by the Public Service Commission, the operator removes and stockpiles the topsoil from the area he's initially going to mine. Then he does the same with the subsoil. After that a giant electrically powered shovel called a dragline is moved to the stripped area and digs a trench or pit about 120 feet wide down to the coal (150 feet is about as deep as the dragline can reach) and perhaps two or three miles long. The dirt the dragline scoops up is piled on the surface in a ridge that parallels the pit away from the direction the mining will take. At some point, part of the overburden is moved by larger loaders and end-dump trucks.
- Other equipment such as drilling rigs (in case the coal has to be drilled for blasting), rippers, loading shovels, and front end loaders follow to take out the coal and load it into coal hauling trucks. These special trucks, which carry about 200 tons of coal at a time, take their loads to the unloading and crushing facility, and from there it goes to the customer.
- In the meantime, the dragline (which is movable) travels back to the beginning of the pit, moves over another 120 feet and begins digging a new pit parallel to the first one. The dirt from the second pit is dumped along the length of the first pit as the digging proceeds, the dirt from the third pit goes into the second pit, and so on. If the mining continued without reclamation, the long ridges of dirt would look like a plowed field under a magnifying glass. However, the land would not be useful for any purpose.
- Instead, the ridges are leveled with

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# Coal Mining and Reclamation (cont.)

bulldozers and the land is reshaped with scrapers and motor graders to the topography approved by the Public Service Commission in the mining permit. Then the subsoil is taken from the stockpiles and respread, followed by the topsoil material. Finally, the land is seeded, fertilized and mulched. The land must be returned to its premine level of productivity before the mining operator can be released from liability.

Coal plays an important part in North Dakota's economy. The production for Fiscal Year 2007 was 30,489,000 tons, compared to 16,750,000 tons for 1980 and just 5 million tons for 1970. The highest yearly production occurred in Fiscal Year 1993 when 32,011,426 tons were produced. Most of the coal was burned to generate electricity and for conversion to substitute natural gas. Future

expansion of the lignite industry will depend in large part on changes in Federal environmental laws such as the Clean Air Act, and the development of additional uses for lignite.

Currently there are six active coalmines in North Dakota. The four large surface mines that produce lignite are the Beulah, Center, Falkirk and Freedom mines, and there are two small mines that produce leonardite (an oxidized lignite), the Ullman and GeoResources mines. In addition, there are five other mines that have closed and remain permitted and bonded for reclamation purposes. These are the Gascoyne, Glenharold, Larson and Royal Oak mines.