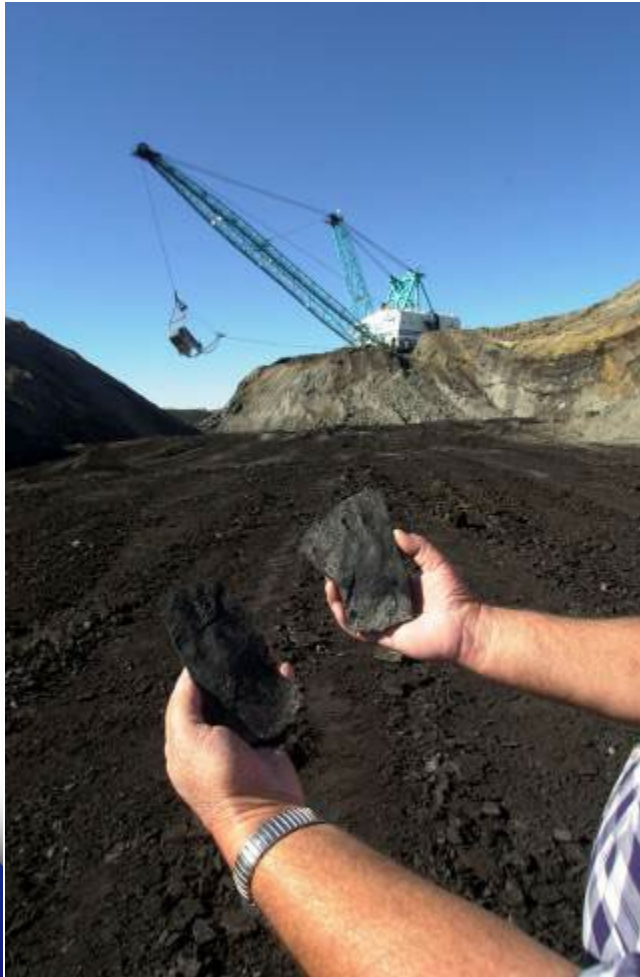




Lignite Mining and Reclamation Process

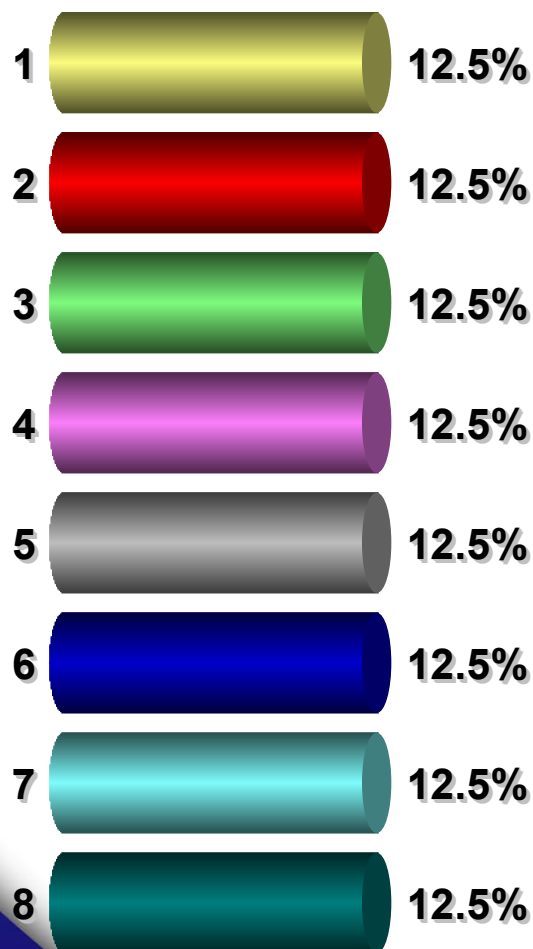
*Jon Rudnick, PE
BNL Coal, Ltd.*

Presentation Overview



- **History of Regulation**
- **The Process of Mining and Reclamation**
- **Community Engagement**

Which of the following are not currently active lignite coal mines in North Dakota?



- 1) The Center Mine
- 2) The Gascoyne Mine
- 3) The Freedom Mine
- 4) Indian Head Mine
- 5) The Falkirk Mine
- 6) Both 1 and 5
- 7) Both 2 and 4
- 8) Both 1 and 4

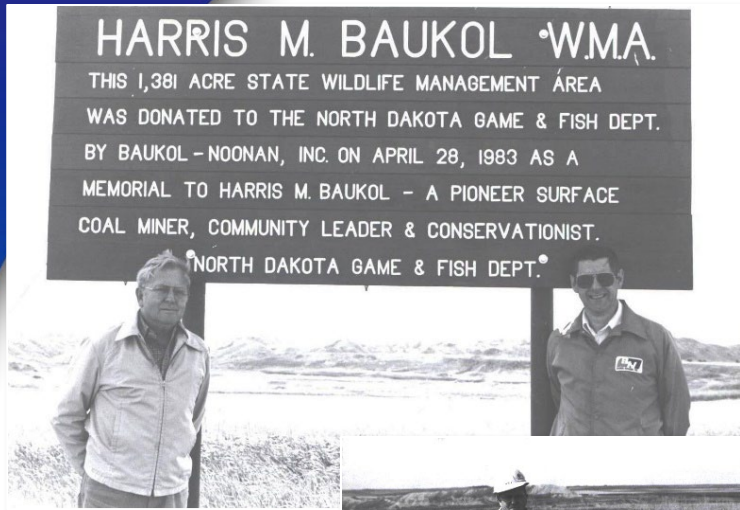
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- 7) Both 2 and 4
- 8) Both 1 and 4

History of Regulation



- ***Increased surface mining in the early 1900s***
- ***first reclamation laws in the 1930s***



- ***14,000 acres of abandoned mined lands in ND.***
- ***Managed for wildlife habitat and hunting***



Regulatory Developments

- **1969 - North Dakota Strip Mined Lands Act**
- **1971 - Grade spoils to accommodate farm machinery**
- **1973 - Save and replace topsoil**
- **1975 - Mined lands must be returned to 100% of pre-mine productivity**



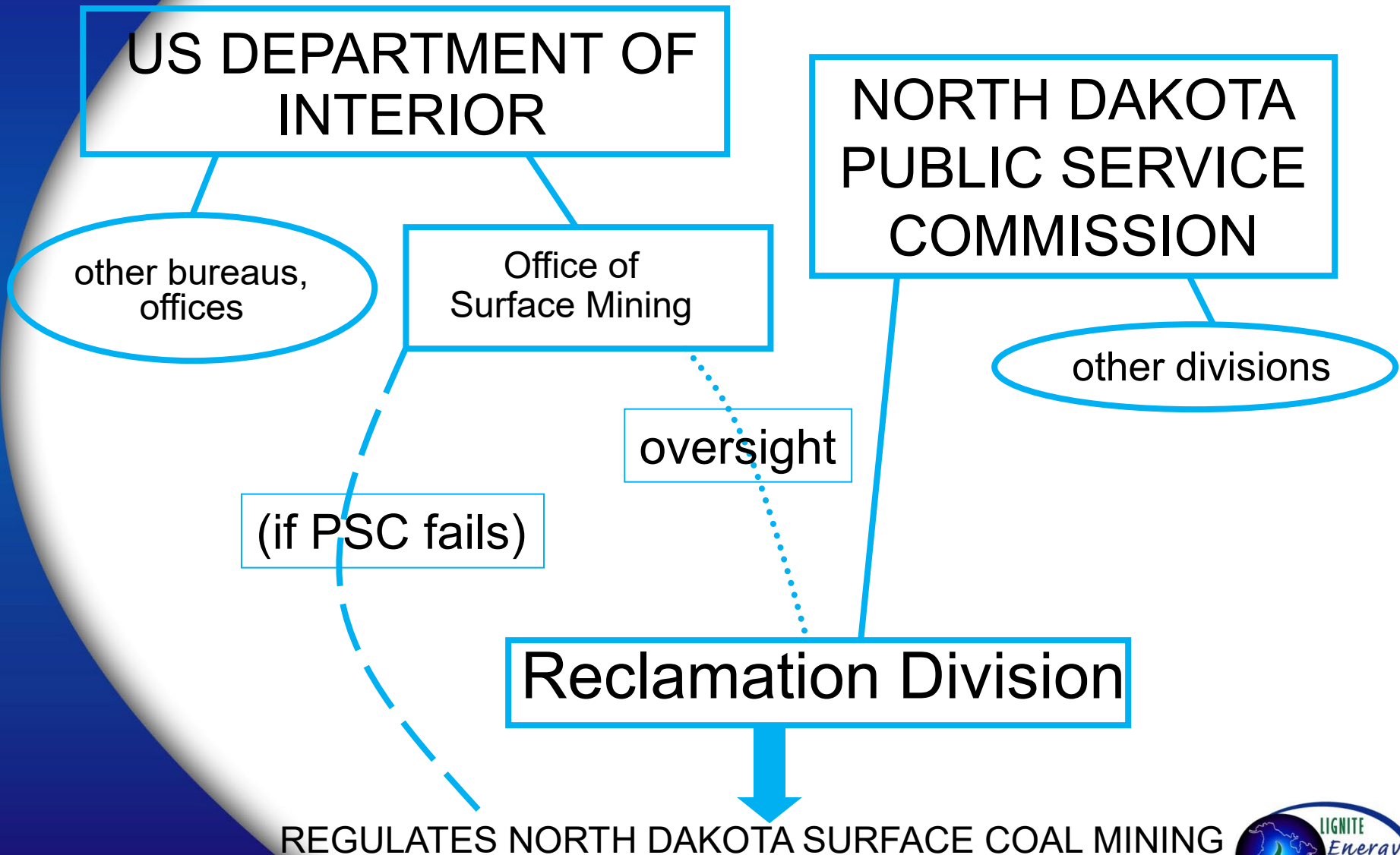
***Early reclamation:
rolling landscape,
seeded grasses***

Orphan spoils



***North Dakota reclamation history in the
landscape***

1977 Passage of the Federal Surface Mining Control and Reclamation Act (SMCRA)



HOW DO YOU DETERMINE WHERE TO ESTABLISH A COAL MINE?

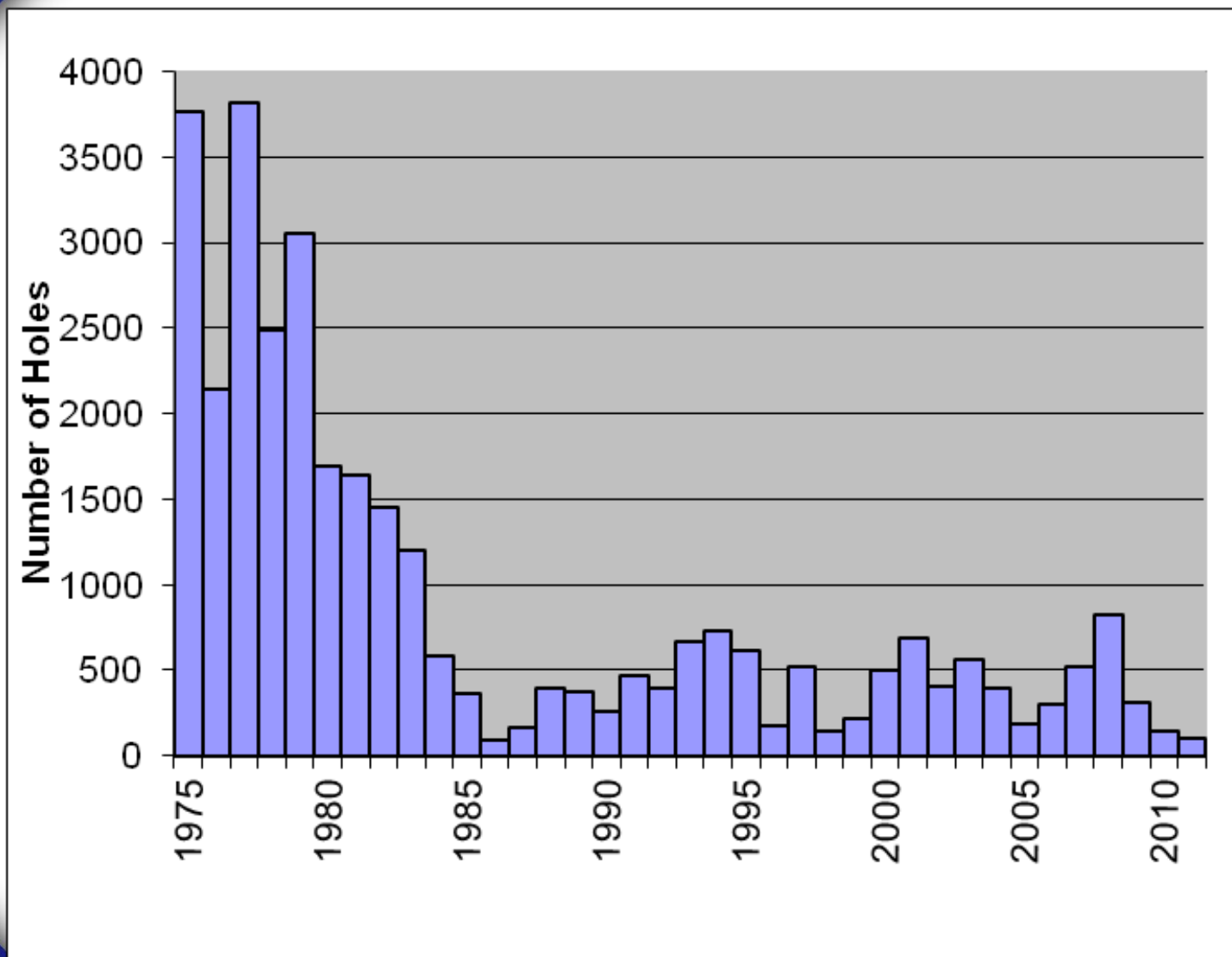








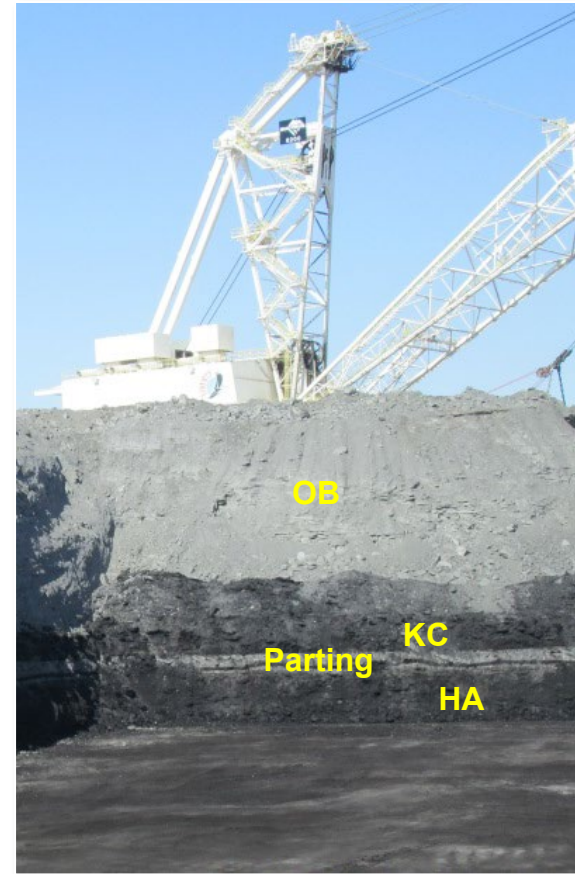
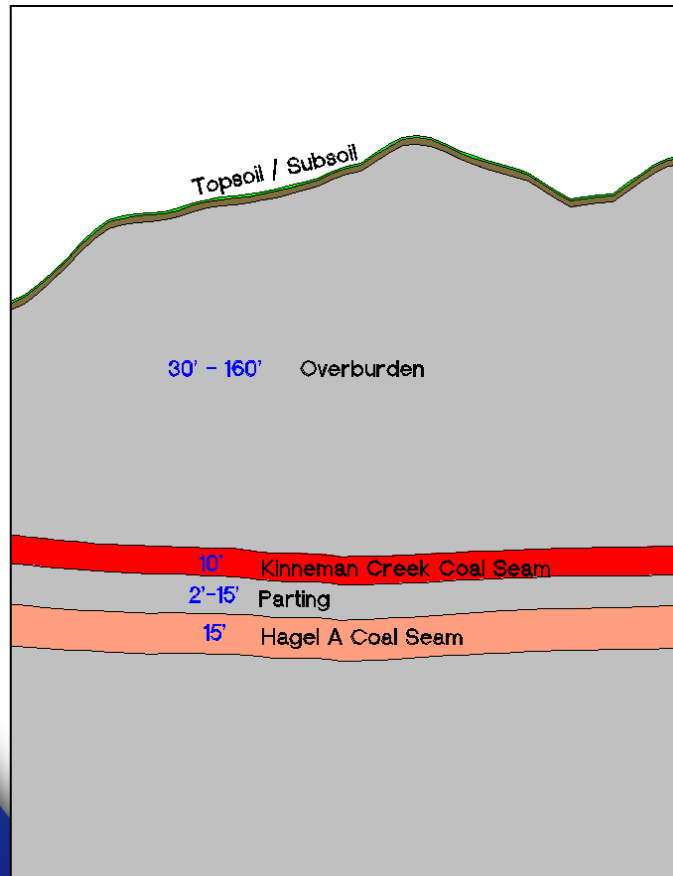
Coal Exploration Drill Holes In North Dakota



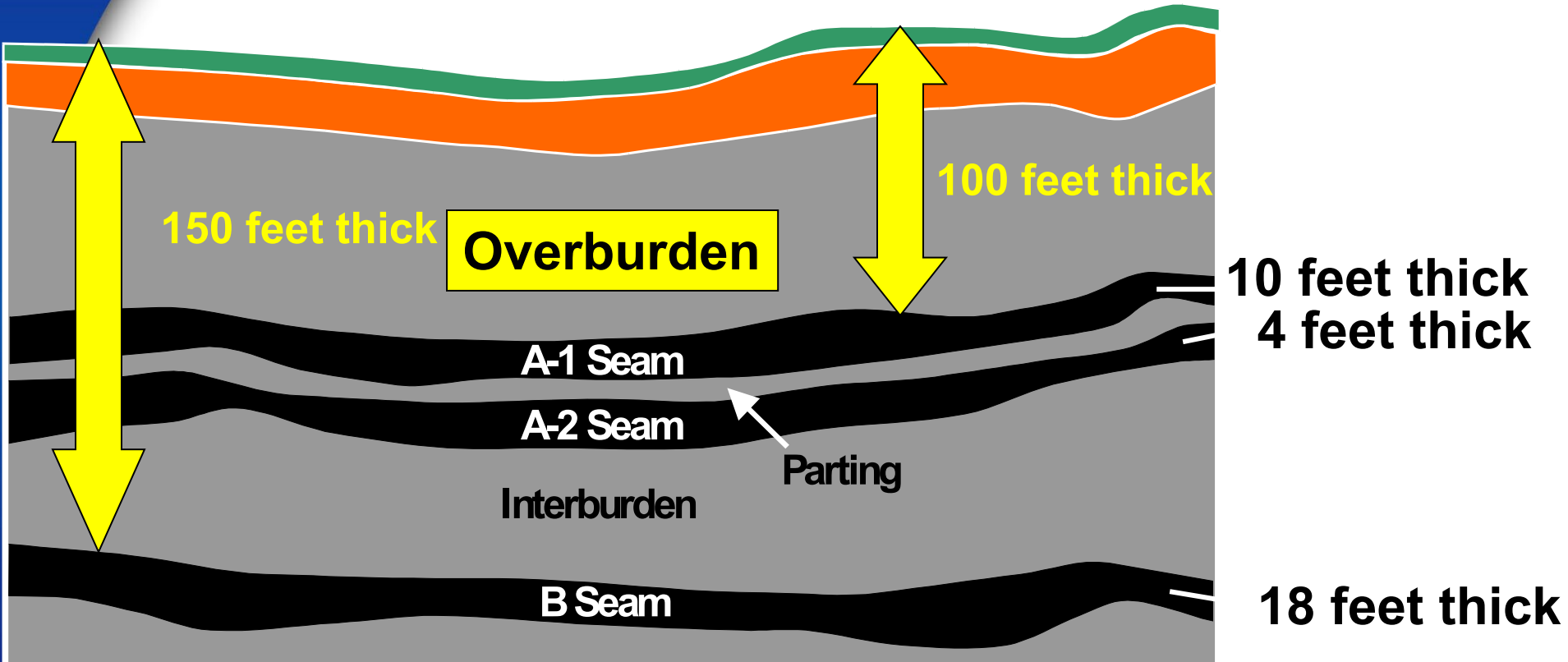
Criteria For Economically Recoverable Coal

- **Minimum 10 feet cumulative thickness in not more than two beds** (no bed less than 2.5 feet thick)
- **More than 25 feet beneath the surface**
- **Not more than 175 feet beneath the surface**
- **Stripping ratio of not more than 10:1** (i.e., not more than 10 feet of overburden per every foot of coal)

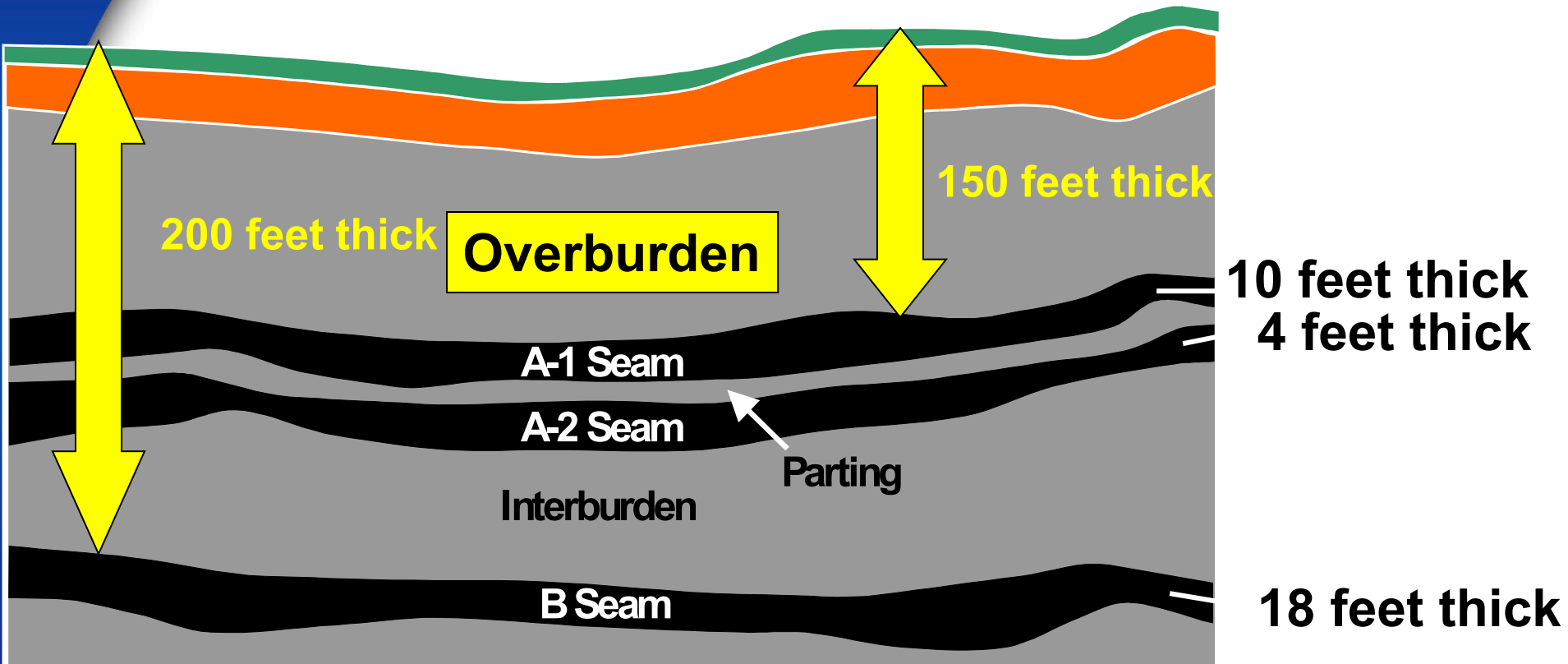
Coal Seams and Overburden



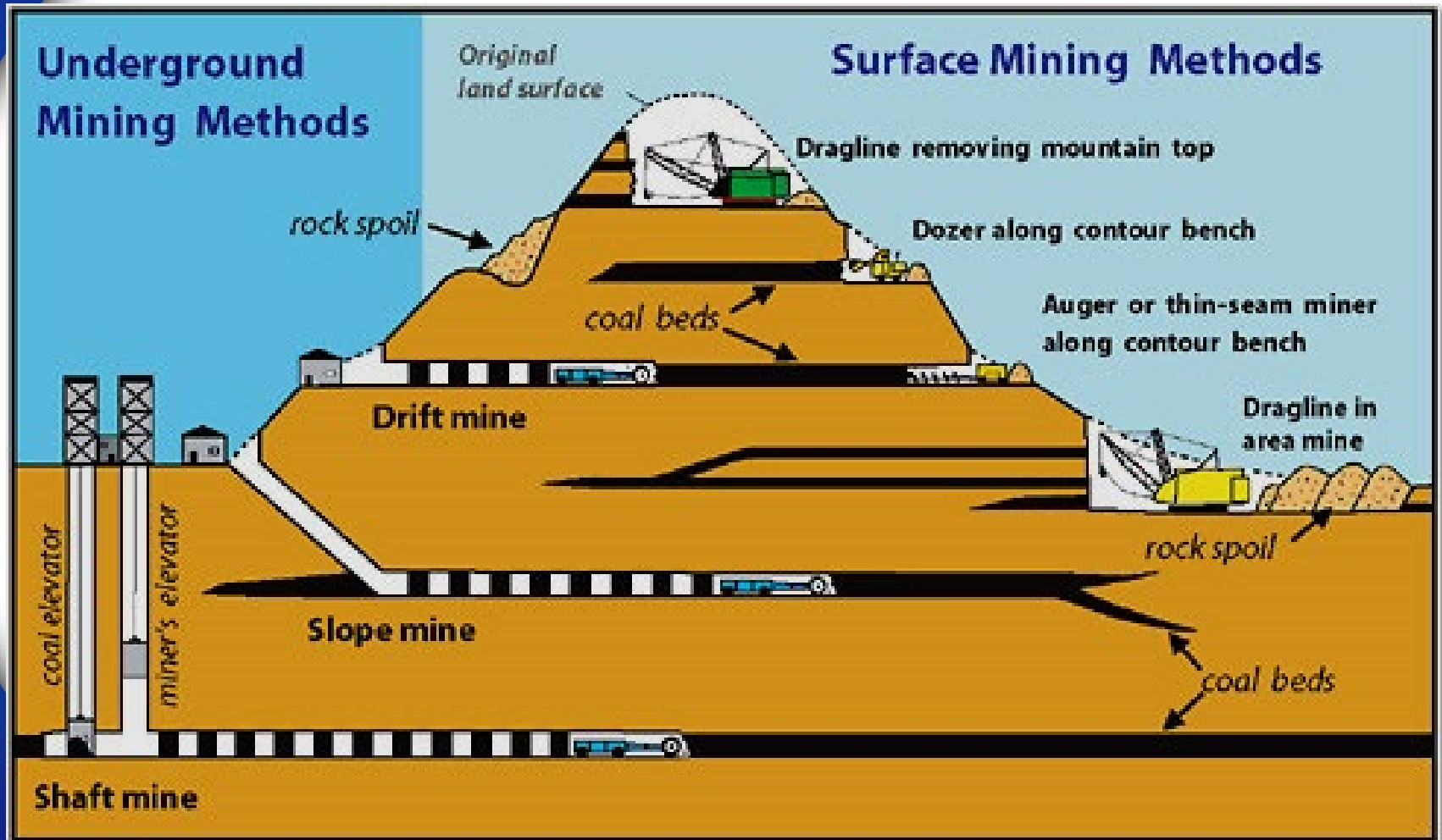
Economic to Mine



Not Economic to Mine



Mining methods



The Process of Mining and Reclamation

- 1. Obtain mining rights and regulatory approvals**
- 2. Establish water management**
- 3. Remove topsoil and subsoil**
- 4. Move overburden and remove coal**
- 5. Grade spoils to approximate original contour**
- 6. Spread subsoil and topsoil and seed with grasses or crops**
- 7. Obtain bond release**

Step 1. Obtain Mining Rights and Regulatory Approvals



BNI
coal

A BNI ENERGY COMPANY

2360 35th Avenue SW
Center, ND 58530
701-794-8734
fax 701-794-3125

[Home](#) · [Section 1](#) · [Section 2](#) · [Section 3](#) · [Section 4](#)

Permit BNCR 1101
Initial Submittal
December 12, 2011
Permit Application - Approved May 28, 2014
Revision 08 - Approved May 11, 2023

[Table of Contents](#)

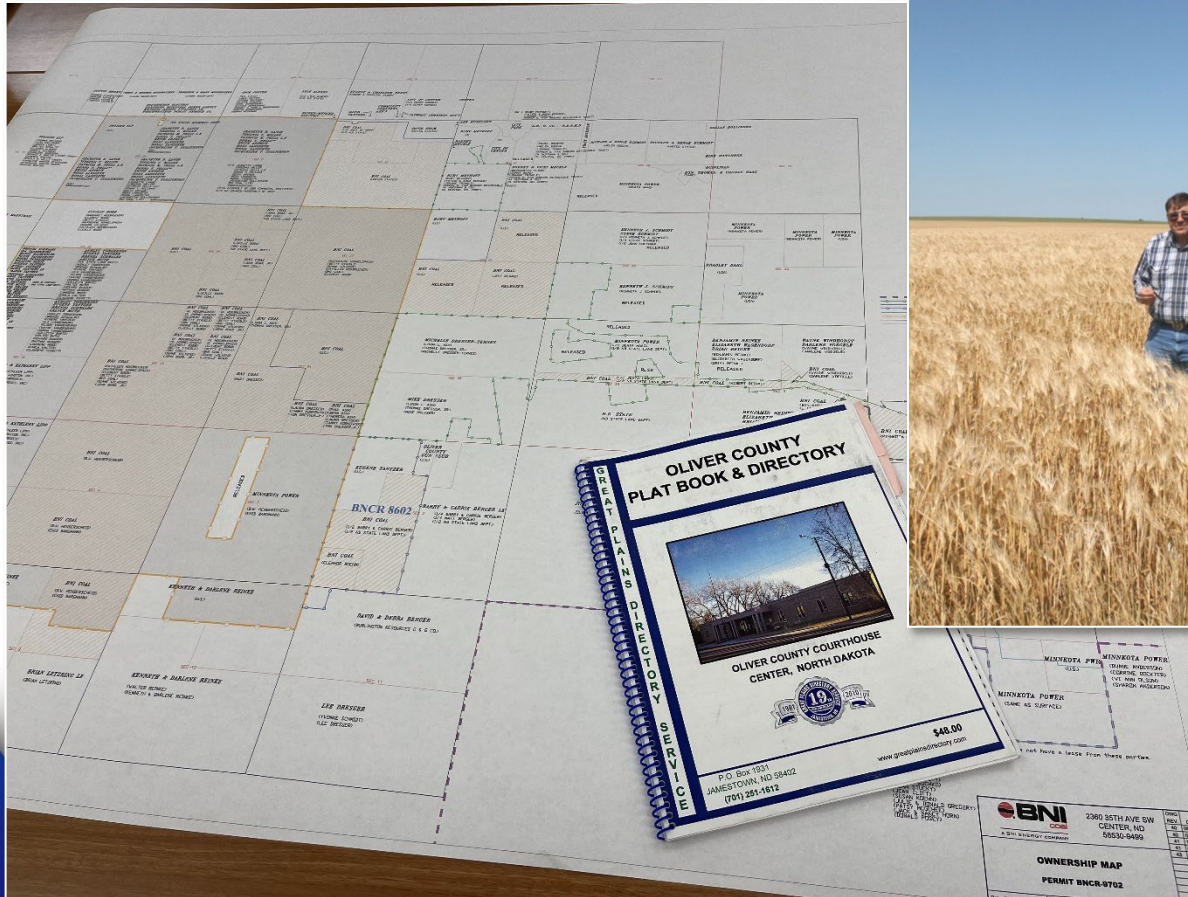
1. [Legal and Financial](#):
Filing Fee, Public Notice, Ownership Information
Business Entity, Metes & Bounds Description,
Areas Unsuitable for Mining, Current Surface Permits,
Other Licenses and Permits, Past Violations, Liability
Insurance, Consultants, Easements, Landowner
Notification, Leases

2. [Extended Mine Plan](#):

3. [Environmental Resources](#):
Topographic Information, Geology, Ground & Surface
Water, Premining Landuse & Vegetation, Prime Farmland,
Soils Resources, Alluvial Valley Floors, Fish & Wildlife,
Climate, Cultural Resources.

4. [Operations](#):
Operations Plan, Existing Structures, Blasting Plan,
Transportation Plan, Surface Water Management Plan,
Water Monitoring & Drillhole Reclamation, Reclamation
Schedule, Regrading Plan, SPGM Removal & Replacement,
Revegetation & Post Mining Landuse, Fish & Wildlife
Resource Protection Plan, Bonding

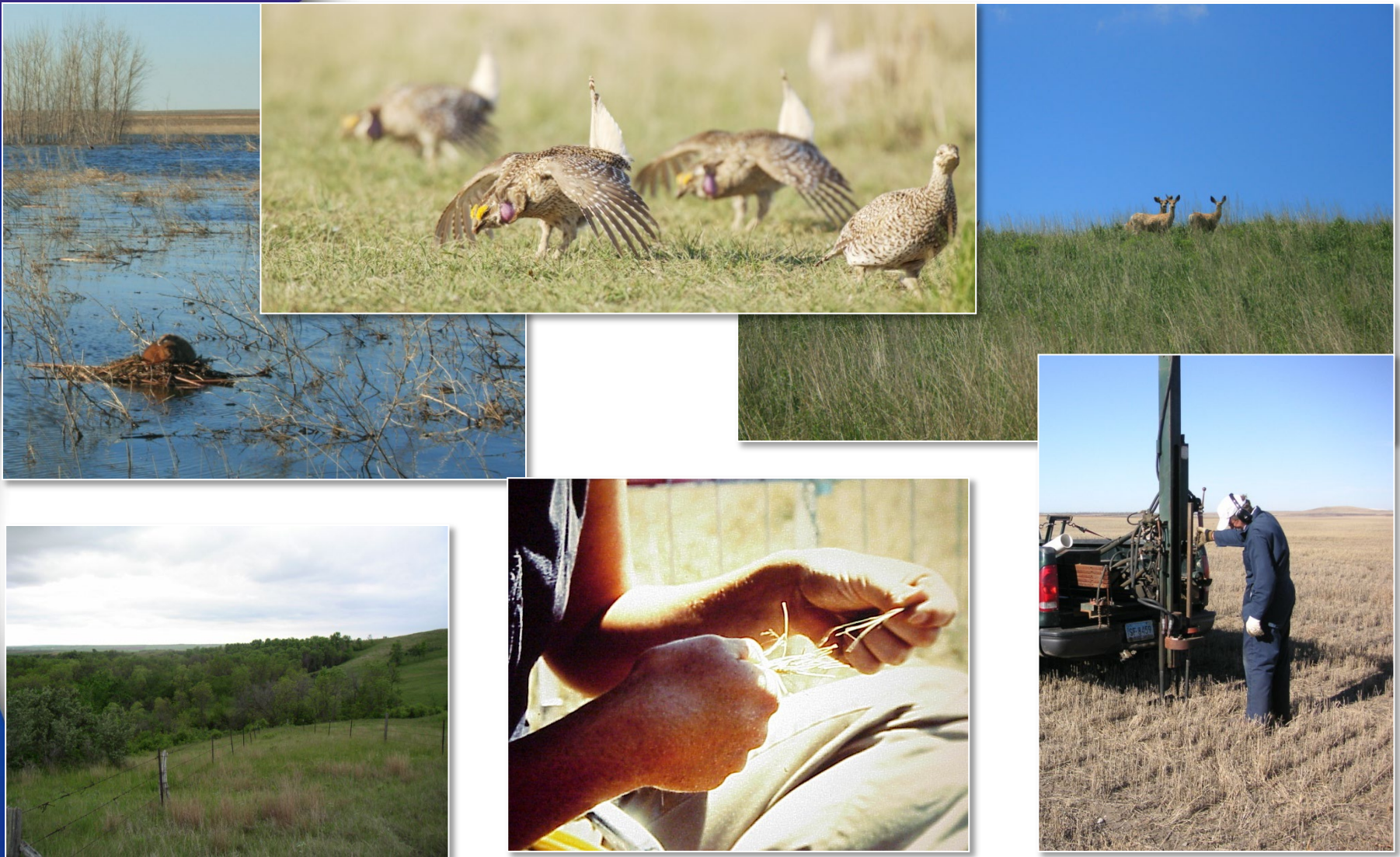
Secure Leases or Ownership...



...And Collect Baseline Data...

- ***Geological drilling***
 - *characterize the coal and overburden*
 - *Exploration permit necessary*
 - *Drill hole sites immediately reclaimed*





Pre-mine soils, vegetation, land use and wildlife surveys are conducted.

- ***Surface and ground water quantity and quality assessed***
 - ***stockponds***
 - ***wetlands***
 - ***springs***
 - ***water wells***



Cultural resource surveys identify sites that must be studied further, mitigated, or avoided completely.



**All this information,
plus proposed
mining and
reclamation plans, is
compiled into a
mining permit
application**

Permit BNCR 1101
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1. [Legal and Financial:](#)

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Resource Protection Plan, Bonding



**and submitted to the
Public Service
Commission for their
review and approval.**



Warning signs placed on the permit area perimeter

Step 2. Establish Water Management



Sediment ponds are built downstream from areas to be mined

- ***Water is allowed to settle until it meets EPA standards***
 - ***total suspended solids***
 - ***pH***
 - ***iron***



Once standards met, water is discharged off the mine and down its normal drainage



The size and shape of a sediment pond depends on the size of its contributing watershed and the topography of the pond site.





Some ponds have a valve for discharging and some must be pumped



regardless of the discharge method, all water leaving the mine is sampled for compliance.



Sediment ponds must be cleaned out occasionally

Step 3. Remove Topsoil and Subsoil





Soil is hauled with tractor-scrapers, shovels, backhoes or loaders into haul trucks.



- ***Soil monuments left after stripping***
 - ***how much topsoil and subsoil removed***

***Soil is either
directly
spread on
reclaimed
land***



***or stockpiled for
later respread.***



***All soil stockpiles
are numbered and
identified by
owner.***



***All operations are
inspected regularly by
the Public Service
Commission***

Step 4. Move Overburden and Remove Coal



- ***electric powered
draglines-primary
overburden removal
machine***

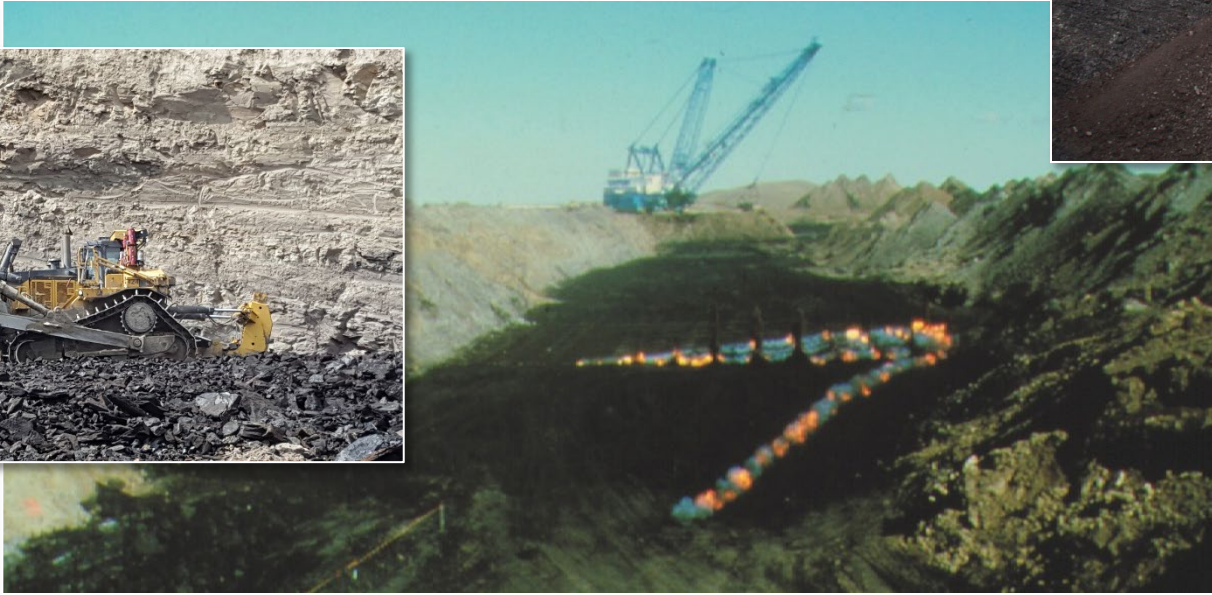




Supplemental earthmoving machinery includes large electric loading shovels, hydraulic excavators and front end loaders, combined with large haul trucks.



These have advantages in flexibility. Spoil can be placed exactly where desired, reducing final reclamation grading costs.



After the coal is exposed it is cleaned and ripped or blasted to prepare it for loading



Coal loaded out of the pit using electric loading shovels or front end loaders



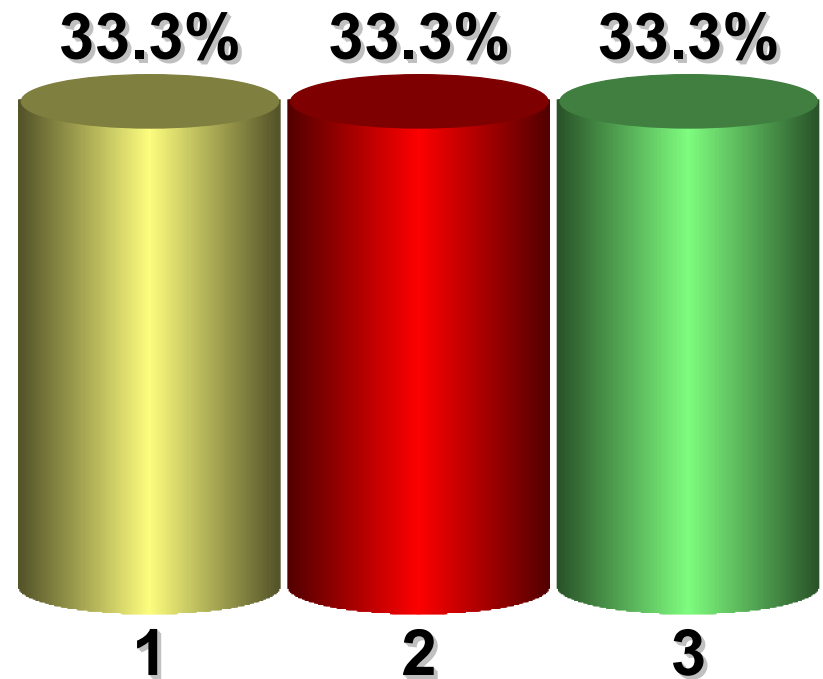
Coal is hauled to the truck dump where it is crushed and delivered to the customer



- How many years after coal removal does the law require land to be graded and seeded?



- 1) 1
- 2) 3
- 3) 5



- How many years after coal removal does the law require land to be graded and seeded?



1) 1

2) 3

3) 5

Step 5. Grade Spoils





Active pit →
Direction of mining
Recently cast spoil

← Previously graded spoils
Finished and ready for
soil spreading

Spoils are normally graded toward the active pit.



- ***Approximate original contour***
- ***Approved by PSC before soil respread***

Step 6. Spread Subsoil and Topsoil and Seed With Grasses and Crops



- ***Soil hauled by scrapers or trucks***
- ***Spread with bulldozers***
- ***GPS system used to control soil depths***



- *Topsoil is tilled to prepare seedbed*
- *Rocks are picked prior to seeding*





***Native grasses are seeded on areas
reclaimed to prairie***

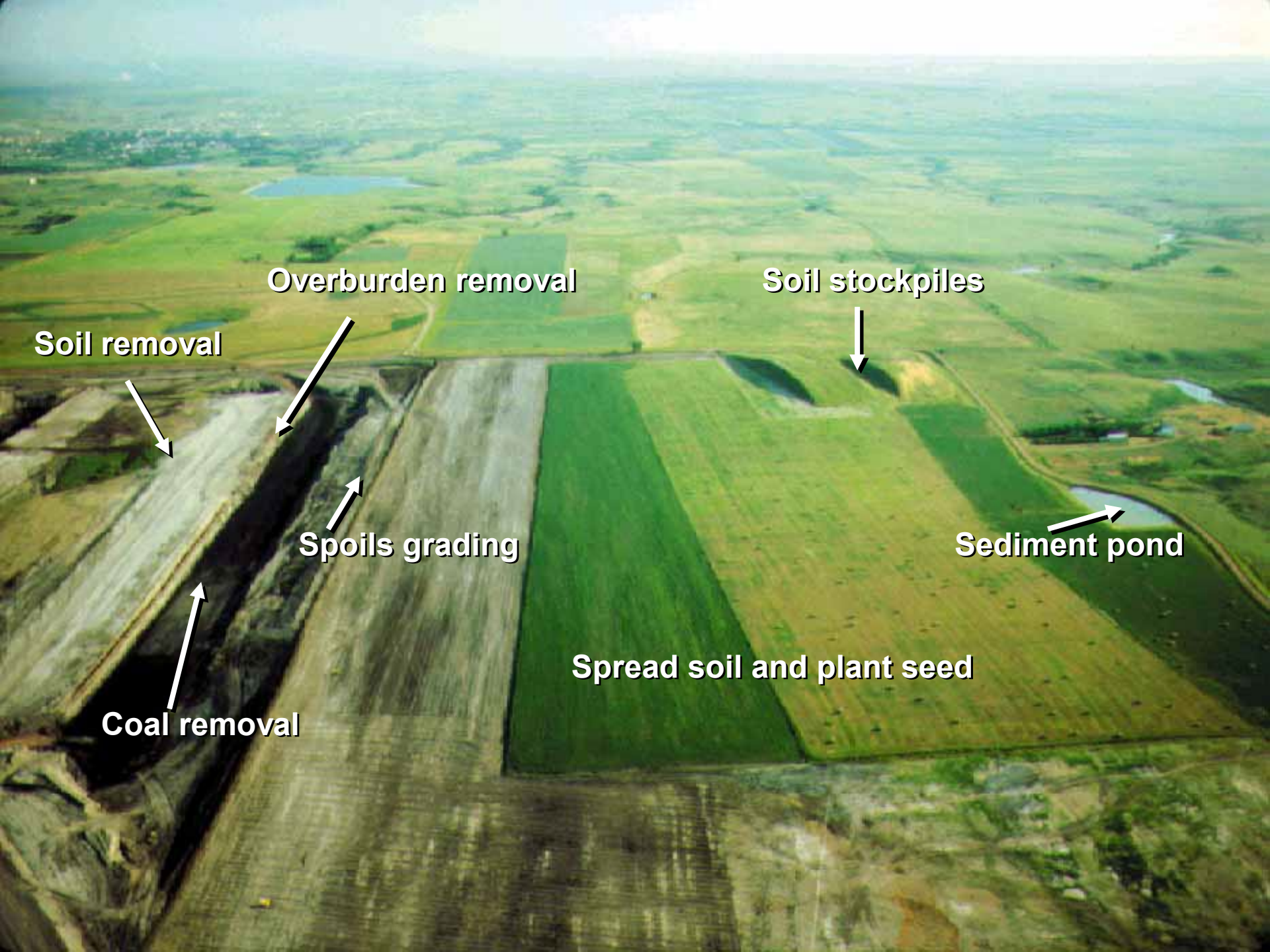


Local farmers plant and harvest crops on reclaimed cropland





***Some reclaimed lands
are seeded to a hay crop
of alfalfa and grasses***



Overburden removal

Soil stockpiles

Soil removal

Spoils grading

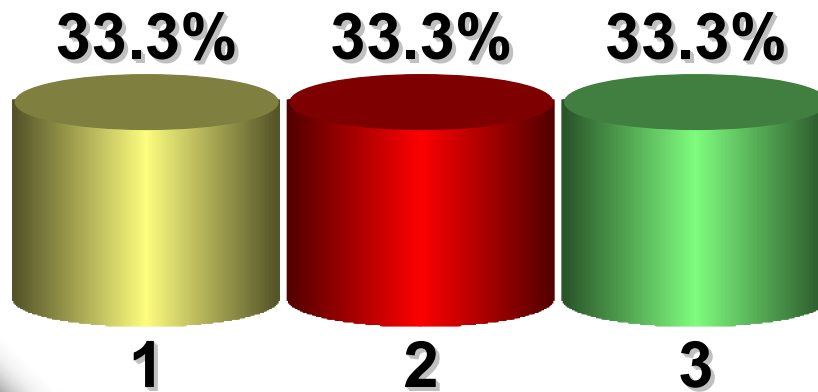
Sediment pond

Spread soil and plant seed

Coal removal

- How many acres have North Dakota coal mines released from bond?

- 1) Over 5,000
- 2) Over 12,000
- 3) Over 25,000



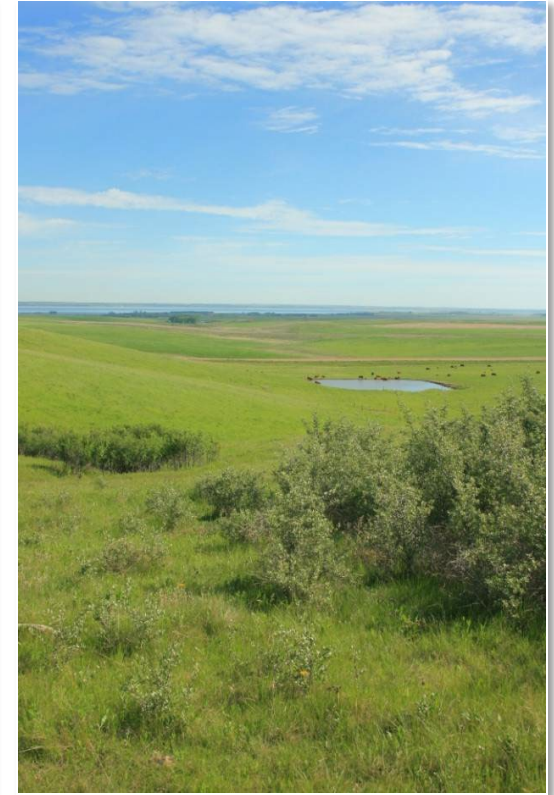
- How many acres have North Dakota coal mines released from bond?

- 1) Over 5,000
- 2) Over 12,000
- 3) Over 25,000 – 27,000+



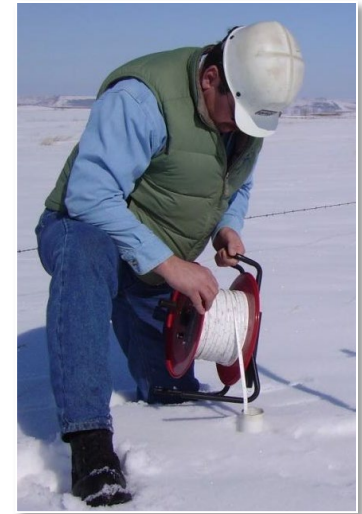
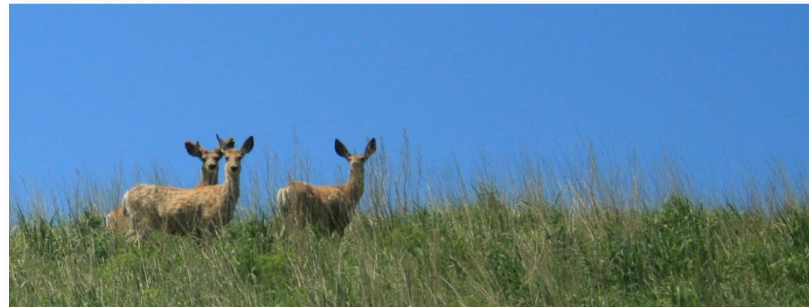
Step 7. Achieve Bond Release

- *Land must be monitored for at least ten years after seeding before bond release can be obtained*





- **Monitor**
 - **Surface water**
 - **Ground water**
 - **Wildlife**
 - *habitat removed during mining must be replaced*
 - *number of wildlife must compare to adjacent, undisturbed areas.*



Local farmers seed crops on reclaimed land with the goal to meet or exceed pre-mine production.



Native grassland is managed to obtain production, cover, and diversity necessary to restore North Dakota prairie.

The ultimate goal is to make the land just as or more productive than it was pre-mining.



APPLICATION FOR FINAL RELEASE OF BOND FOR SURFACE COAL MINING AND RECLAMATION OPERATIONS
PUBLIC SERVICE COMMISSION
RECLAMATION DIVISION
SFN 19813 (1-2004)

Date	10-21-22
Permit Number	BNCR9702
State	ND
Zip Code	58530

Name of Permittee	BNI Coal LTD	Bond Release Number	2
Post Office Address	2360 35th Ave SW	City	Center

Pursuant to the provisions of NDCC 38-14.1-17, the above named Permittee hereby makes Application for Final Release of Bond for Surface Coal Mining and Reclamation Operations for the above Bond Release Number and Permit Number.

Final release of bond is requested for the tracts clearly delineated on the attached map, **Attachment I**, which are particularly described by the attached metes and bounds descriptions, **Attachment II**, and as follows:

TRACT NUMBER	ACRES	LOCATION			
		SEC.	TWP.	RANGE	COUNTY
Exception 03	196.91	34	142	84	Oliver
TOTAL ACRES	196.91				



Final bond release can then be granted by the Public Service Commission, and the land can be removed from the permit and sold or traded.

Community Engagement

- ***Tours***
 - *General Public, Schools, Organizations, etc.*



Community Engagement

- ***Sporting Chance***
 - *Annual hunting event put on by Minnkota Power Cooperative and BNI Coal*





**Thank You on behalf
of BNI Coal!**

Questions???