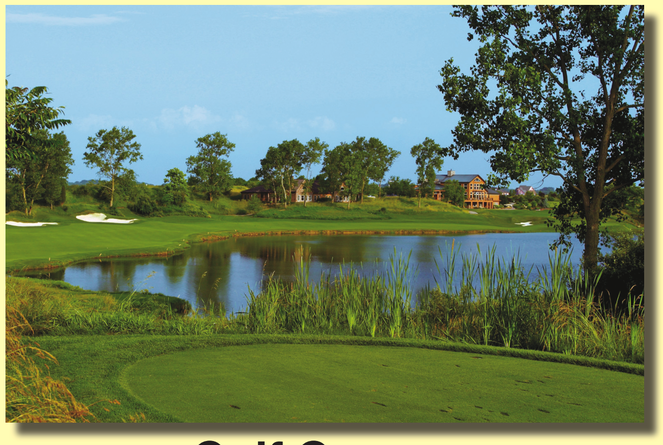
What Do All These Places Have in Common?

Prison

Residential/
Housing Development



Golf Course

Ski Lake/ Marina

Residential/Summer House

Airport

Wildlife Habitat/
Restored Stream

Grazing Land

School

They Are All Reclaimed Mine Sites!

On the front:

Prison:
Big Sandy Prison / Czar Coal, Pevler Complex, #880-0117, Martin County, Kentucky (Coal)
Big Sandy is a minimum and maximum security federal prison built on reclaimed land in eastern Kentucky.

Residential:
Eagle Rise Subdivision Housing Development / Ernst Aggregates, Bellebrook Gravel Pit (Dry Pit), Green County near Bellebrook, Ohio (Sand and Gravel)
Notice how the houses are built above the reclaimed highwalls and within the bowl around the lake.

Golf Course:
Victoria National Golf Course / Peabody Coal Company, Victoria Mine, Warrick County outside Newburgh, Indiana (Coal)
Designed by world famous designer Tom Fazio, this golf course is ranked among the top 100 golf courses in the world.

Ski Lake / Marina:
Brandywine Tract North and Ski Course / Chaney Enterprises, LP, Brandywine Tract, Prince George's County, Brandywine, Maryland (Sand and Gravel)
The site includes the ski lake with a small boat docking area.

Residential:
Summer House on Recreational Lake / Buffalo Crushed Stone, Cattaraugus County, New York (Sand and Gravel)

Airport:
Wendell Ford Regional Airport / Leslie Resources, Perry County, Hazard, Kentucky (Coal)

Wildlife Habitat and Restored Stream:
Wildlife Habitat and Restored Stream Through Center of Reclaimed Site / Blazon Coal Company, Blazon Mine, Carbon County, Clear Creek, Utah (Coal)

Grazing Land:
Native Grassland for Cattle Grazing with A Reclaimed Woodlands Section / Basin Cooperative Services, Glenharold Mine, Mercer County, Stanton, North Dakota (Lignite Coal)
The producer cooperator said that calves from reclaimed land are about 40 pounds heavier than those on undisturbed grassland!

School:
Clearfield Elementary School / Lawrence Township, Clearfield County, Pennsylvania (Brick and Clay)
Crescent Brick and Clay deep mined clay on this site and then sold the property to Marion Brick and Glen-Gery Corp. You can see part of where reclamation of several thousand feet of abandoned highwall was completed behind the school building.

On the back (before, during and after photos):

Wildlife Habitat
Wildlife Habitat / Paramont Coal Company Virginia, LLC, Black Bear #1 Mine, Dickenson County, Virginia (Coal)
This site won IMCC's National Coal Reclamation Award in 2006.

Golf Course:
Renditions Golf Grand Slam Experience / Chaney Enterprises, LP, Mardis Mine, Anne Arundel County, Maryland (Sand and Gravel)
The golf course architect, Dave Edsall Golf Design, Inc., duplicated famous holes from well-known golf courses in the reclamation design (this is known as a replica course). This site won IMCC's National Noncoal Reclamation Award in 2004.


Black Bear #1 Mine (VA) – Before Remining

What is Reclamation and How is it Done?

In the early days of mining, companies didn't think much about how the land would be used after the minerals were taken out of the ground. In the 1970's, laws were passed to protect the land and to require it to be returned to some useful purpose after mining. This is called reclamation. If reclamation is done right, people are protected from hazards like dangerous cliffs and deep ponds, the land is protected by requiring the soil to be returned and grass and trees to be planted, and the environment (air and water) is protected by requiring mining companies to stop pollution.

The "top left" photograph above of the mine site in Virginia is a good example of why laws for mining and reclamation are needed. This site was first mined by a different company before the laws were passed and the land was left in poor condition. These older mines often left steep cliff-like highwalls that were ugly and dangerous. They also left areas with no grass or trees which would often then allow dirt and sand to mix with rain water and run into nearby streams (called erosion), causing fish and plants in the water to die. Sometimes the land would heal itself naturally, but not before environmental damage was done. This site will look even better after the reclamation is completed than it did before the company mined it, and it will be safer. When a company goes back to mine and reclaim a site that was mined and left unreclaimed many years before, this is called remining. Paramont Coal Company Virginia, LLC's Black Bear #1 is a remining site.


Mardis Mine (MD) – During Mining

There are many uses for land that is reclaimed the right way, as the pictures on this poster show. Some of these uses are: ponds or small lakes that can be used by farmers or for fishing; fields for farming; pastures that animals can use for grazing; recreational areas such as golf courses, parks, ball fields, and playgrounds; forests; wildlife areas or wetlands for birds and animals; large open areas for building houses, shopping malls, hospitals, prisons, airports, schools, or other types of businesses. There are lots of possibilities depending on the size and type of mine that is being reclaimed, the surrounding area, and the condition of the land. The decision about what to do with the land involves lots of people: the landowner, the mining company, the people who live near the mine, and the people from the nearby city or town who make decisions about what can be built in the area.

The most important part of reclamation is good planning. The miner must know how the land is going to be used after mining before he begins mining. This way the miner knows how to mine in the best way to protect the land. The miner has to work closely with the state government, which writes the laws about how to mine and reclaim land. The states require the miners to pay money before they begin mining to make sure they do a good job. This is called a bond. If a miner does a poor job or leaves without finishing his work, the state uses the bond money to do the reclamation work itself. The company gets the bond money back if they finish the reclamation and do a good job.


Black Bear #1 Mine (VA) – During Mining

The two "during mining" photos (top center and left inset) show actual mining happening. At one site (left inset) sand and gravel is being mined and at the other site coal is being mined. You can see in the pictures that there are many things happening during mining that can cause environmental problems and that could be unsafe for people. Some of these things are dust, noise, dirty water, and erosion (where dirt mixes with water and then clogs up nearby streams). If the miner starts reclaiming the land right away, even before he is done with all of the mining in other areas, some of these problems can be fixed or stopped. This is called contemporaneous reclamation. The sooner the reclamation starts, the better for people and the environment.

When reclamation is done right, the miner will make sure that all of the different areas of the mine are fixed. This includes the following:

- Holes that the miner made to search for minerals must be filled in. This will stop water from filling up the holes.
- Entrances to underground mines (called shafts or adits) must be closed so that people will not fall into the mines or go exploring in the mines. It is very dangerous to go into mines. The walls and roofs (ceilings) may be unsafe and could fall in, tunnels can be easy to get lost in, and sometimes there are dangerous gases in mines that can kill. Sometimes grates (metal nets) are put over the mine openings to keep people out but to let bats and other animals get inside the mine and use it as a place to live.
- Roads that were built by the miner to haul the minerals out of the mine must be removed and fixed. The same thing must be done for any pipes or ditches that the miner used to help control water during mining.
- Equipment used for mining has to be removed. Sometimes the miner has to break the equipment up first before moving it because it is so large. If the miner built any buildings, those would have to be torn down and removed too.
- Any pits that were left after taking the minerals out of the ground must be filled in or, if water is going to be left in them as part of the use of the land after mining, the miner has to be sure the ponds or lakes are safe. This sometimes means that fences have to be built around the pond or lake. It is also important to make sure the water is clean, especially if people are going to swim or fish in it.

After all of these things are done, the miner has to fix the land by doing several things. Some of these things are:

- At surface mines, where lots of dirt was removed to get down to where the minerals are, this dirt (called overburden) must be placed back into the pit after the minerals are removed. Then the dirt must be graded or smoothed out. After this is done, the miner has to place topsoil on top of the overburden material so that grass and trees can grow. Usually, the topsoil has been saved from when the mine was first started and it is then put back. It is smoothed out so that the land has the shape it had before mining (called approximate original contour). Sometimes the miner has to push dirt and topsoil up against any cliffs (called highwalls) that the miner made during mining. This has to be done a little at a time so that the material stays in place and so that the cliff is eventually covered.


Black Bear #1 Mine (VA) – After Reclamation (Wildlife Habitat)

- After the land is put back into the right shape, the next step is to plant either grass or trees. This depends on how the land will be used. If it is going to be a pasture, hay or special grasses will be planted. If it is a farm, some type of crop like corn, soybeans, or wheat will usually be planted. If the land will be used as a forest or wildlife area, trees and shrubs will be planted. If the land will be developed for other uses, grasses are usually planted to keep the topsoil in place until it is time to build. If it is going to be a golf course, like in the picture shown below, the next step is for the architect to begin building the golf course design. It all depends on the final land use – which is where we started our discussion.
- Once the grass and trees are planted, the miner must make sure that they stay healthy. He will fertilize the grass and will make sure the rain does not wash away the grass seed or the tree saplings. It is important to keep the grass and trees growing so that the topsoil is not washed away (erosion). Sometimes the miner might also build small dams to keep the water away from the newly planted areas. In a short time, the grass and trees will start to grow and the land will look like the top right and right inset photographs.


Mardis Mine (MD) – After Reclamation (Golf Course)

These two photographs are excellent examples of successful reclamation. The two companies did such a good job at reclaiming the mine sites that they won national awards for their reclamation work. The reclaimed area of the Black Bear #1 mine reclamation project by Paramont Coal Company, Virginia LLC will look a lot like it did before mining once it's completed. The reclamation at the exact spot of the top left and top center photos is still being finished. However, the top right picture shown here was taken from a different part of the same mine site that has already been reclaimed and shows what it will look like once reclamation is finished. The site will have the same shape (nice and hilly) and will have lots of grass and small trees on it. The reclamation work will also get rid of some dangerous highwalls left by miners from many years ago.

The Renditions Golf Grand Slam Experience was once the Mardis Mine where sand and gravel were mined. The mining company, Chaney Enterprises, LP and the architect, Dave Edsall Golf Design, Inc., reclaimed and built the golf course around some natural areas that they left untouched on purpose. You can see this from the two inset photos taken during and after mining, though they were taken at different seasons of the year.

As a result of the mining companies' efforts, the land has been returned to a beneficial use; the area is safer for people and animals; and there won't be any environmental problems.

Mining is important for all Americans. And good reclamation makes mining a good memory.

Interstate Mining Compact Commission Member State Regulatory Authority Contacts:

Alabama Department of Industrial Relations, Mining and Reclamation Division (Noncoal), Phone: 334.242.8265

Alabama Surface Mining Commission (Coal), Phone: 205.221.4130

Arkansas Department of Environmental Quality, Surface Mining and Reclamation Division, Phone: 501.682.0744

Illinois Department of Natural Resources, Office of Mines and Minerals, Phone: 217.782.4970

Indiana Department of Natural Resources, Division of Reclamation, Phone: 812.665.2207

Kentucky Department for Natural Resources, Phone: 502.564.6940

Louisiana Office of Conservation, Phone: 225.342.5586

Maryland Department of the Environment, Mining Program, Phone: 410.537.3557

Missouri Department of Natural Resources, Phone: 573.751.4044

New Mexico Department of Energy, Minerals and Natural Resources, Phone: 505.476.3405

New York State Department of Environmental Conservation, Division of Mineral Resources, Phone: 518.402.8072

North Carolina Department of Environment and Natural Resources, Division of Land Resources, Phone: 919.733.3833

North Dakota Public Service Commission, Reclamation Division, Phone: 701.328.2251

Ohio Department of Natural Resources, Division of Mineral Resources Management, Phone: 614.265.7073

Oklahoma Department of Mines, Phone: 405.427.3859

Pennsylvania Department of Environmental Protection, Office of Mineral Resources Management, Phone: 717.787.5103

South Carolina Department of Environment and Conservation, Phone: 803.896.4262

Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Phone: 865.594.5529

Texas Railroad Commission, Surface Mining and Reclamation Division, Phone: 512.463.6901

Utah Division of Oil, Gas and Mining, Phone: 801.538.5306

Virginia Department of Mines, Minerals and Energy, Phone: 276.523.8100

West Virginia Department of Environmental Protection, Phone: 304.926.0499

Wyoming Department of Environmental Quality, Phone: 307.777.7192

Bird Seed Mining Activity
(Activity Developed by the Nevada Division of Minerals)

Purpose:
Mining is a complex process in which relatively small amounts of valuable or useful minerals or metals (ores) are extracted from very large masses of rock. This activity will illustrate how this "needle in a haystack" process works.

Objective:
Students will be able to experience "hands-on" the difficulty that miners face in locating valuable mineral deposits. They will also learn a simple lesson in economics — a less valuable commodity may be more profitable because it is more abundant. Students will be shown the importance of clean, environmentally-conscious mining, and will learn that all mining operations must perform and pay for reclamation work.

Materials Needed:
- Wild Bird Food — any commercial birdseed mix with sunflower seeds and at least 2 other seed varieties
- Shallow pans (inexpensive pie pans pans work well)
- Small beads (approximately 2 mm) in colors of blue, gold, and silver
- Medium beads (approximately 4-6 mm) white color

Instructions:
- Divide students into groups of 4 to 6.
- Pour approximately 1.5 pounds of birdseed into each pan.
- Add 2 gold beads, 4 silver beads, 4 blue beads, and 3 white beads to each pan and mix into the birdseed.
- The beads and seeds represent the following:

Gold beads	=	Gold
Silver beads	=	Silver
Blue beads	=	Copper
Sunflower seeds	=	Iron
All other seeds	=	Waste
White beads	=	Reclamation

(These beads will be assigned a COST rather than a VALUE because reclamation must be done at all mining operations regardless of how much profit was made. You may not want to tell students what the white beads are for until after they have completed their "mining".)

- Students search through the seed mixture and separate out or "mine" beads and sunflower seeds, making separate piles of each type bead and the seeds. Allow 5 to 10 minutes for the mining activity.
  Note: The instructor should hint to the students that they should mine NEATLY, not mixing waste seeds with their beads, sunflower seeds, and not scattering seeds all over the area. The instructor can have the option of examining the work of each group, or assigning a helper to monitor (a regulatory authority mine inspector) each group to see how cleanly the "mining" is being done. The instructor or helper may assign an arbitrary "fine" to cover costs for "environmental damage" at messy tables.
- Assign a value for each type of bead or seed as in the following example:

Gold bead	=	Gold	=	$5.00 each
Silver bead	=	Silver	=	$4.00 each
Blue bead	=	Copper	=	$3.00 each
Sunflower seeds	=	Iron	=	$2.00 each
All other seeds	=	Waste	=	$0.00
White beads	=	Reclamation	=	($100.00) each

Note: Depending on the math ability of a particular group, these values can be changed to suit the instructor's needs. For example, the value assigned for each commodity could be based on the current actual market price. Reclamation costs could be elevated to the thousands of dollars.

- *Have the students count up the number of gold, silver, and blue beads, and sunflower seeds from their piles and multiply the number of each by their values given above. Document all the information on the "Birdseed Mining Spreadsheet". Students should also note the amount of any "environmental damage" fines on the spreadsheet. Students should count the number of white beads in their pile and multiply by the reclamation factor. This number should be recorded on the reclamation cost line on the spreadsheet.*
- *Have each group total up the dollar value of their "mining" operation, subtracting the environmental damage fines and reclamation costs. Have each group share their success with the others. Prizes may be awarded to the best table of "miners."*

Birdseed Mining Spreadsheet (Beginning, Intermediate and Advanced Levels)

Gold Bead Equals GOLD:
Number of Beads _____ X _____ (Price) = _____ (Value)
Intermediate: X 10 oz. ***Int/Adv*** ***Advanced:*** X 100 oz. X price per oz.

Silver Bead Equals SILVER:
Number of Beads _____ X _____ (Price) = _____ (Value)
Intermediate: X 10 oz. ***Int/Adv*** ***Advanced:*** X 100 oz. X price per oz.

Blue Bead Equals COPPER:
Number of Beads _____ X _____ (Price) = _____ (Value)
Intermediate: X 100 oz. ***Int/Adv*** ***Advanced:*** X 2,000 oz. X price per lb.

Sunflower Bead Equals IRON:
Number of Beads _____ X _____ (Price) = _____ (Value)
Intermediate: X 100 oz. ***Int/Adv*** ***Advanced:*** X 2,000 oz. X price per lb.

TOTAL Product Value = _____

SUBTRACT cost of Environmental Damage Fines = _____

Number of White Beads:
Equals Reclamation Cost _____ X _____ (Price) = _____ (SUBTRACT Reclamation Cost)

GRAND TOTAL = _____

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