



# **Citizen Guide to Land Reclamation**

**Presented by  
The Indiana Soils/Prime Farmland Team**

## INDIANA SOILS/PRIME FARMLAND TEAM (12/2007)

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*2000 National award winning reclamation at the Columbia Mine*

## ***TEAM PURPOSE STATEMENT***

*To develop and provide recommendations that ensure the protection, restoration and management of soil resources affected by coal mining in Indiana*

## ***TEAM GOAL***

*To promote coordination among the various government agencies and other entities concerned with the maintenance of prime farmland and cropland-capable land resources.*

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## I. Preface / Summary / Introduction

The development and advancement of steam-powered machinery in the 1940's, transformed Indiana coal production from predominately underground to surface mining extraction. The positive results included greater mining safety for man and machine as well as virtually 100% recovery of the mineral. The production rate in underground mines can be limited to as little as 50% because coal is left behind for roof support and other reasons.

The transformation from underground to surface mining created many new reclamation challenges. Technology out paced science and societal understanding of the environmental impacts. Fast moving machines became capable of moving enormous quantities of materials affecting thousands of acres each year. As production continued to rise, irreplaceable soils were lost and grading was minimal which left the land useless for crop production. The piles of mining waste that remained generated acid water run-off. Erosion drained once fertile fields of any future productive capabilities. Clearly, surface mining was having significant impacts upon the land and required attention.

In 1926, Indiana coal operators pioneered surface mined land reclamation in the United States when a few of them formed the Indiana Coal Producers Association. They voluntarily decided to revegetate parts of their spoil banks through reforestation. Unfortunately, not all operators joined the Association and not all restoration attempts were successful. A wider and more consistent approach was needed.

Indiana established itself as a national leader in 1941 when State policy makers had the foresight to adopt mining and reclamation laws. As science, technology and experience continued to progress, State laws become more sophisticated. In 1977, Congress adopted the first national coal mining and reclamation program; the Surface Mining Control and Reclamation Act (SMCRA). Much of it is based upon lessons learned in the coalfields of Indiana and founded in three fundamental concepts:

1. Mining can and will be conducted as a temporary disturbance of the land leaving no long term negative impacts;
2. The goal of any responsible and successful mining operation is the full and complete restoration of the land to levels as productive or even more productive than before mining began; and,
3. The greater the participation of the landowner before, during and after the mining and reclamation process, the greater will be the success of reclamation.

**The Indiana Division of Reclamation,  
the U.S. Office of Surface Mining  
and coal mine operators are  
fully capable and prepared to address  
the technical and legal aspects  
of mining and restoration.  
Yet, only with the input of landowners,  
can greater reclamation possibilities  
be found.**

The purpose of this **Citizen Guide to Land Reclamation** is to introduce landowners to their rights and opportunities by exploring legal mandates of Indiana coal mining and reclamation laws; public participation opportunities and limitations; technical aspects of soil properties; soil handling, storage and replacement methodologies; post-mining land use options; and, the various requirements/opportunities guiding landowner decisions. As you read, look for answers to some of these frequently asked questions:

- T How do I know which operator I should allow to mine my land?
  
- T How do I know that my land will be restored properly?
  
- T Can I have my land put back differently than it is now?
  
- T Who will reclaim my land if the operator does not finish the job?
  
- T How long will it be before I get my land back for my own use?

These and many more issues are explored in this brief overview.

## II. Rights and Responsibilities

### Citizen's Rights and Landowner Responsibilities

SMCRA (Surface Mining Control and Reclamation Act), the federal mine reclamation law, assures that appropriate procedures are provided for public participation in the development, revision, and enforcement of regulations, standards, reclamation plans, or programs established by the Secretary of the Interior or any state approved program, including the State of Indiana. Citizens have a right to participate at every phase of the permit application and mining process.

Citizen participation is not and cannot be a substitute for governmental responsibilities. Citizen involvement in all phases of the regulatory scheme is sought and strongly encouraged. Citizen participation helps to ensure that the decisions and actions of the regulatory authority are grounded upon complete and full information.

The Indiana Surface Coal Mining and Reclamation Act (I-SMCRA) is the state counterpart to the federal SMCRA. The Indiana Department of Natural Resources, Division of Reclamation (DOR), is the regulatory authority that administers the State mining and reclamation laws. I-SMCRA provides access for citizens to all information and records relating to permits, inspections, bonds and other information on which the DOR bases its decisions. However, information submitted by a coal operator that, if released might jeopardize a coal operator's competitive position with regard to other operators, is protected from public availability. This might include commercial characteristics of coal seams to be mined, trade secrets or proprietary commercial information.

Many landowners with coal reserves have questions when initially approached with an offer to mine on their property. A wide array of information is available from several local, State and federal agencies, as well as some public and private resources. Any or all of these may assist the property owners in making well informed decisions regarding the course to take in recovering this important resource.

The federal offices of Surface Mining (OSM) and Natural Resources Conservation Service (NRCS), the Indiana Department of Natural Resources (DNR), the state Extension Service, the Soil and Water Conservation Districts (SWCD's), farm organizations such as Farm Bureau, Farmers Union and others may offer valuable information.

The responsibility of the landowner is a very important one and cannot be overemphasized. Indiana and federal mine reclamation agencies will ensure that the mining laws are enforced and reclamation conditions of the permit achieved. The primary responsibility for the future capability and productivity of the land begins with the landowner. No other person can evaluate an effective plan for the land as well as the owner of the land.

Landowners are strongly encouraged to make themselves aware of how the coal business operates: how coal is mined, processed and sold; about the various provisions of mining and reclamation law and how the law applies to their specific situation. Landowners need to talk to people with knowledge of the coal business. Additionally, some mining companies allow the landowner to return to farming the land prior to final bond release. It is important that the landowner farm the reclaimed land responsibly so as not to cause erosion or other problems for the mining company which may threaten or delay the bond release process.

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The DOR is one of your primary sources of information. Knowledge is power, and the landowner needs knowledge to ensure that mining is only a temporary disruption of existing land use and does not produce permanent negative impacts.

Often, when considering a proposal to allow coal mining on their property, landowners will contact the DOR and ask for a reference or recommendation regarding the trustworthiness and competency of the operator. For a wide variety of reasons, primarily differing site conditions, individual landowner desires and legal constraints, neither the DOR, OSM or any other office will be able to recommend one operator over another. These agencies can, however, answer many other questions and provide significant information allowing a landowner to make an informed decision. Listed below are some guidelines one may wish consider:

- ✓ Get knowledgeable and competent legal assistance before engaging in any negotiations. A coal lease and “right of first refusal” are legal documents prepared by attorneys for the coal companies. To protect themselves and their property, landowners are strongly encouraged to seek legal assistance. Attorneys, who understand both the coal business and the landowners’ point of view, are a valuable resource. **The Division of Reclamation has no authority to settle disputes concerning lease agreements. These are binding legal documents that are the jurisdiction of civil courts.**
- ✓ Ask the operator for a tour of land previously mined and reclaimed by that company.
- ✓ Ask the operator for a list of landowners who have allowed their land to be mined by this same company.
- ✓ Visit the DOR Jasonville Field Office and review any previous and/or existing permits of the operator. These documents will demonstrate the compliance and reclamation history of an operator. DOR staff is available to review and explain the documents with any interested party.

**Although money is important  
and is often emphasized  
in negotiations for a coal contract,  
it is by no means the only consideration ...  
In fact, no amount of money received  
can overcome a poor job  
of mining and reclamation.**

Several Indiana operators have been awarded for doing some of the best reclamation in the nation. Good reclamation is the result of research, forethought and planning by the landowner and good mining operation by the coal operator. In other words, a good mining operation should produce good reclamation. Good mining and reclamation operations look beyond the immediate process to the future sustainability, productivity and profitability of the land.

Although money is important and is often emphasized in negotiations for a coal contract, it is by no means the only consideration. The future well being of the land is no less important. In fact, no amount of money received can overcome a poor job of mining and reclamation. Therefore, it is important for landowners to specify in the lease any particular reclamation the landowner might desire such as soil thickness, amount of cropland restoration, erosion control structures, ponds, etc.

However, the landowner should be aware that the DOR **does not** have the authority to enforce lease agreements that are more stringent than Indiana mining law. Lease disagreements must be resolved in civil court. Landowners who approach this endeavor in a careful and deliberate manner will find that they are amply rewarded for all the time, effort and expense involved.



## **The Indiana Division of Reclamation**

The Indiana Department of Natural Resources - Division of Reclamation is responsible for regulating the mining of coal and the restoration of lands disturbed by coal extraction. The DOR is divided into two program areas - regulatory and restoration.

**Regulatory** - This program oversees permitting, mining operations and reclamation for all operating coal mines in Indiana.

**Restoration** - addresses areas disturbed by coal mining prior to 1977, but were not completely or appropriately restored and for which there is no continuing reclamation responsibility under SMCRA.

Further information regarding either program area may be obtained at each of the following addresses and telephone numbers:

Division of Reclamation  
R.R.2 Box 129  
Jasonville, IN 47438-9517  
(812) 665-2207  
(800) 772-6463 (toll-free only in Indiana)  
(812) 665-5041 FAX

IDNR - Division Of Reclamation  
Central Office  
402 West Washington Street  
Room W295  
Indianapolis, IN 46204  
(317) 232-1547  
(317) 232-1550 FAX

## **The U.S. Office of Surface Mining (OSM)**

OSM monitors implementation of the Indiana program to assure adequate permitting, inspection, and enforcement operations. This monitoring is conducted on a continuous basis through sample reviews of State actions on permits, inspections, citizen complaints, etc. OSM will also respond to written complaints from individuals after reviewing State actions. At the end of each year, OSM issues an annual report for the results of their oversight of the Indiana DOR performance implementation of the approved program.

Further information on OSM activities in Indiana may be obtained at the following address and phone number:

Office of Surface Mining  
575 North Pennsylvania Street  
Minton-Capehart Federal Bldg., Room 301  
Indianapolis, IN 46204  
(317) 226-6700  
(317) 226-6182 FAX

## **The U.S. Natural Resource Conservation Service (NRCS)**

The NRCS is the federal agency responsible for the development, distribution and maintenance of soil surveys. The NRCS, in cooperation with other federal and state agencies, publishes soil surveys that provide descriptions of soils and mapping units. The NRCS also provides a list of prime farmland soils, their location, physical and chemical characteristics, crop yields, and associated data necessary to support adequate prime farmland descriptions. The NRCS reviews and comments on the proposed methods of soil reconstruction on prime farmland areas. The NRCS develops specifications for prime farmland soil removal, storage, replacement, and reconstruction during each phase of coal mining.

## **What is Prime Farmland?**

Prime farmlands are those lands, as determined by the NRCS, as having the best combination of physical and chemical characteristics for producing food, feed and forage. Additionally for SMCRA purposes, these soils must have been historically used for cropland production to be considered as prime farmland. State and federal law requires a minimum of 48 inches of soil (topsoil and subsoil) be removed, stored and replaced on all prime farmland areas. The operator must restore prime farmland to 100% of its pre-mining level of productivity as determined by the NRCS for any three (3) years of the responsibility period.

## **What is Non-prime Farmland?**

Non-prime farmlands are all of those lands that do not meet the requirements of prime farmland. The law requires that for these lands the land must be reconstructed by replacing sufficient soil to restore the land to its pre-mining capability. Presently, in Indiana a minimum of 12 inches of soil on non-cropland areas and a minimum of 18 inches of soil for non-prime cropland and exempted PFL cropland is required. Be aware that the term “soil” may include substitute soil materials. Non-prime farmland must be restored to 90% of original productivity.

## **Prime Farmland Exemptions**

When the NRCS determines that lands within the permit area are designated as prime farmland the coal operator may get an exemption from prime farmland standards in one of two ways. First, the operator may request a “negative determination” requiring a demonstration that the land has not been historically used for cropland. This means that the lands have been used for cropland less than five (5) years out of the ten (10) years prior to acquisition for surface coal mining and reclamation operations. Other negative determination options are to demonstrate that the slope of the land is 10% or greater, the surface is very rocky or the land is flooded during a growing season more than once in two (2) years.

Secondly, the operator may demonstrate that the prime farmland areas are eligible for “*grandfathering*”. This applies to an operation that was operating on August 3, 1977 and has held continuous permits since that date.

Once the land is exempted from meeting PFL standards, current practice in Indiana allows conversion of the pre-mine PFL root zone to replacement of a 12-inch minimum soil layer if exempted due to negative determination and 18-inches for PFL exempted due to grandfathering.

## **Bond Release**

Prior to mining, the operator is required to provide a performance bond for the area within the permit upon which the operator will conduct mining and reclamation operations. The bond will range from a minimum of \$3000 to a maximum of \$10,000 per acre. The final amount is calculated upon the difficulty of reclamation should the operator fail to fully or properly restore the land and the State must complete reclamation. This bond shall be for the duration of the surface mining and reclamation operation plus an extended period of liability. The extended period of liability starts after the last year of seeding, fertilizing, irrigation, or other work and continues for not less than 5 years. The DOR may release bond in whole or in part (called phases), when the operator demonstrates the reclamation covered by the bond has been accomplished as required and public notice requirements have been met. When an operator completes the backfilling, regrading, re-topsoiling and drainage control of a bonded area according to the reclamation plan, as much as 60% of the bond may be released (Phase I). After revegetation has been established on the regraded mined lands, as much as 25% of the bond may be released (Phase II). Release of the remaining portion of the bond occurs when an operator has successfully completed all remaining surface mining and reclamation requirements (Phase III).

Landowners and adjacent landowners will be notified and may provide input at each stage of bond release. The DOR must conduct, in a timely manner, an inspection and evaluation of the reclamation work involved. The DOR will notify the surface owner, agent or lessee prior to the inspection. The DOR will evaluate compliance with the approved plan including:

- restoration of the approximate original contour
- soil replacement thickness
- crop productivity records
- number of living trees or shrubs present per acre (if applicable)
- erosion control
- water quality (ground and surface water)
- plant coverage and type
- impoundment designs

Any landowner, coal operator or other potentially adversely affected party may request a review and hearing on the DOR's bond release decision before a Department Administrative Law Judge. If a party continues to disagree, judicial review may be sought.

***1997 National award winning reclamation at the Blue Grass Mine***



### III. Mining Operations and Reclamation

#### Mine Operations Plan

The mine operations plan details the operator's proposal for mining coal. Included in the plan must be: a description of the mining operation to be conducted, proposed life of the mine, and the information to demonstrate that the reclamation can be accomplished.

The actual mining process and techniques used to extract coal are proposed by the mine operator and must be approved by the Division of Reclamation (DOR), Department of Natural Resources prior to implementation.

#### Soil Removal and Storage

Before mining begins, operators must plan for the replacement of topsoil and subsoil after the coal has been removed. Details involving the removal, storage, replacement, and protection of the topsoil and subsoil from wind and water erosion are listed in the mine operation plan. Topsoil, which is removed in a separate layer from areas to be disturbed, is immediately re-distributed or stored on approved locations.



*...and either moved to a separate location within the permit area or replaced immediately. Replacing and grading the soil as quickly as possible enhances post-mining productivity.*

Operations usually occur in the following manner. Scrapers or other machinery remove the topsoil and subsoil and directly redistribute it on graded overburden or stockpile it for replacement after mining. Seeding and mulching protect the topsoil from wind and water erosion. Stockpiles are marked as being topsoil or subsoil and protected with a cover of vegetation.



*To ensure that adequate soil is available for restoration, soil is collected in advance of the mining operation...*

**The DOR reviews a mining application for the technical, legal and financial ability of an operator to complete mining and reclamation as described. No mining may begin until an operator has received all applicable approvals, including the consent of the landowner.**

Careful handling of the topsoil and subsoil is crucial for reclamation because this is the medium in which the success or failure of plant growth on the reclaimed site is determined. The replaced soil profile on areas designated as prime farmland must be a minimum of 48 inches including topsoil and subsoil. The law requires that for non-prime farmlands the land must be reconstructed by replacing sufficient soil to restore the land to its premining capability. Presently, in Indiana a minimum of 12 inches of soil materials on non-cropland areas is required. A minimum of 18 inches of soil materials is required for cropland exempted from restoration to the 48-inch prime farmland standard. Remember, that soil materials may include substitute material. Discuss with the DOR whether substitute materials have been proposed for your property.

### **Overburden Removal and Placement**

After the loose soil materials and rocky overburden are removed, the coal seam is finally exposed and ready for extraction.

After the coal is removed, the coal operator places the rocky material in the bottom of the pit. Overburden can contain layers with pyrite, which when exposed to air and water, can produce acid. Mixing these layers and burying them with neutral materials in the pit, prevents acid production by blocking exposure to oxygen.

To assure that a suitable root medium is available for cropland capability, during reclamation the subsoil layers are placed on top of the graded overburden.

### **Mine Reclamation Plan**

A mine reclamation plan will show how overburden will be graded, subsoil and topsoil replaced and revegetated and the postmining land uses accomplished. Placement of rocky overburden by a mine operation greatly determines the success of reclamation. Carefully shaping the material assures proper grade, slope, and contour design. Throughout the reclamation process, coal operators must meet detailed requirements including a timetable for the completion of each step.

### **Grading and Soil Replacement**

Operators must plan to provide rough grading of mined overburden within 180 days of coal removal and have no more than four ungraded spoil ridges behind the active pit, unless additional time is justified and granted by DOR, the state regulatory authority. The replaced overburden must be shaped to the approximate original contour of the land so that it drains properly and the natural pre-existing drainage patterns are reestablished. Operators must grade materials from the initial pit or box cut to blend with unmined land.

Operators must complete the final grading in a timely manner; usually in time for the next growing season. This includes any subsoil or topsoil replacement and installation of erosion control measures such as terraces, diversions, grass waterways and drains.



*On this site, the coal mine operator has restored more than double the amount required for successful restoration.*

**Alternate or substitute soil materials may be approved by the DOR without notification of or approval by the landowner.**

**Discuss any concerns with the inspector and periodically review the most current version of the permit.**

After the subsoil is replaced on prime farmland, DOR specialists check for proper quality and thickness. Operators must attempt to grade replaced soil in a manner that limits compaction. The type of equipment, as well as the soil moisture content during removal and replacement, many times will determine the productivity and physical properties of the reclaimed soil. Many operators are now using small excavating shovels in combination with end-dump trucks. This method of reclamation produces less compaction of the soil materials. Compaction at any depth in the rooting media will reduce crop yields. Loosening the deep subsoil, by ripping it to depths as much as 48 inches, alleviates compaction of the replaced subsoil. Planting grasses and deep-rooted legumes also helps alleviate compaction through the action of root penetration.

### **Post-Mining Land Use**

The operator must describe all land uses planned after mining, taking care to balance restoration of the land affected to a condition capable of supporting the uses that it was capable of supporting prior to any mining. Where feasible and desirable, a higher and better use than previously existed may be provided. All restored prime farmland must have a postmining land use of cropland.

Any changes from the premining land use must be approved by the DOR. To change how the land will be used following mining, the operator must file an alternative land use proposal in the reclamation plan portion of the permit application. Landowners are notified of the proposed change(s) and are permitted to comment on any such proposals. The postmining land use and changes to the postmining capability, pre-mine land use, landowner's preference, and local citizen and government priorities, policies, and plans for use of the land. The operator's reclamation plan includes comments from landowners and State and local government agencies responsible for approving or authorizing the resulting land use. Also submitted is a discussion of the reclaimed land's capability to support a variety of alternative uses.

**All restored prime farmland must have a postmining land use of cropland**

### **Productivity**

Reclamation plans must give details on any chemical analysis of topsoil to be performed to aid vegetation establishment. Coal operators verify soil texture with spot checks, and apply fertilizer or soil amendments as needed.

Most plans provide for a temporary cover crop of wheat, oats or sudangrass followed by a grass-legume mix for several years on reclaimed land to prevent soil erosion and begin the building of the soil structure. After this period, and before the company's reclamation responsibility ends, vegetation is established that is consistent with the postmining land use plan. In addition, for prime farmland, operators must establish row crop production.

The most common methods used to verify the success or failure of the vegetative growth is either a whole field harvest or a harvest of a representative portion of the field called "test plots". In addition to proof of productivity, ground cover surveys of the vegetation are used on land uses other than row cropland.

**Test plots must be located on each landowner's property unless the landowner gives written permission to locate the test plot on another area of the mine.**

**Test plot soil conditions must be representative of the areas being portrayed by the plot.**

**Landowners are encouraged to monitor the condition of the crop in the test plot for its probable success or failure.**

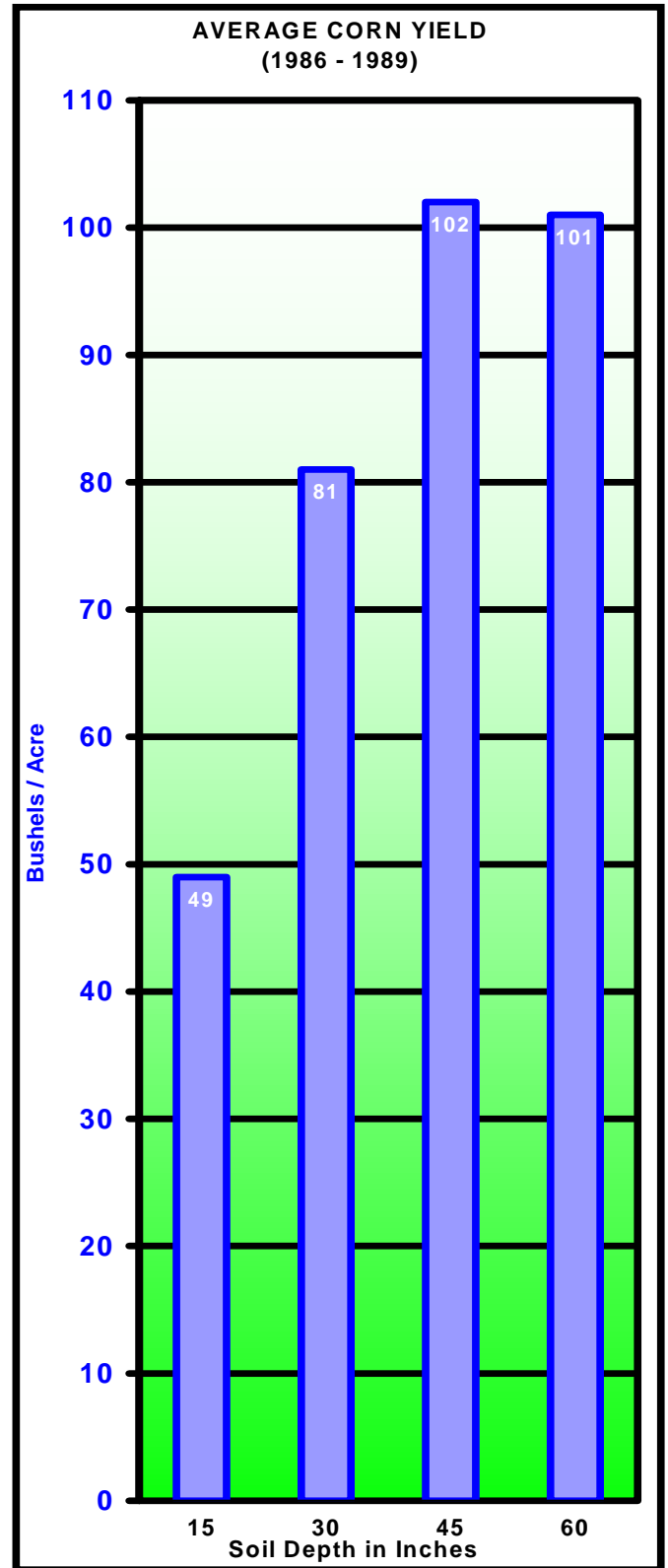
**If possible, the landowner should monitor the harvest itself.**

A five-year vegetation liability period begins when all grading is completed and the land is planted to a crop capable of supporting the postmining land use. For prime farmland, the operator must show full restoration of 100% of the original unmined land productivity using typical crops (e.g. corn, soybeans, and/or wheat) for any three crop years of the responsibility period, which is a minimum of five (5) years.

Non-prime farmland must be restored to 90% of the original productivity for two (2) years of the responsibility period. Forestland use must show growth of 450 trees per acre for a three year period.

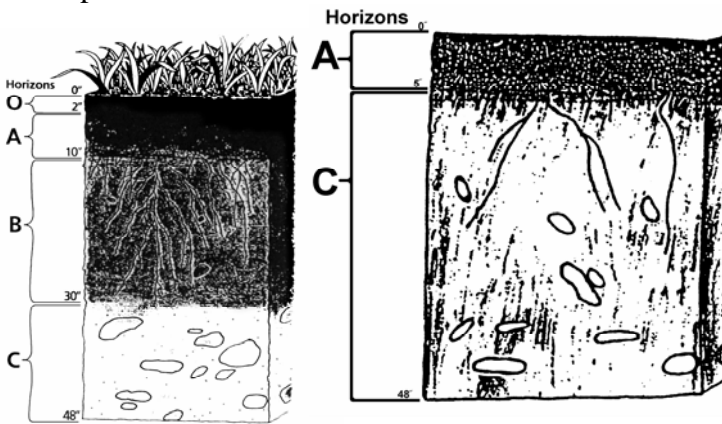
If an alternative land use proposal has been approved or if a water land use existed prior to mining, coal operators may construct permanent water impoundments within the mined area.

**Landowners should work with the coal mine operator to ensure reasonable access to the test plot that is being used to demonstrate the success of their property.**



## IV. Use and Management of Reclaimed Soils

Soil profiles developed under natural soil forming conditions have fairly predictable layers. Profile 1 is an example of a soil profile developed on uplands, in Southwestern Indiana. Natural soil forming processes cause structure, pores and rooting zones to develop. The length of time soils have been developing on upland landforms in Southwestern Indiana range from about 20,000 to a few hundred thousand years. Soil forming processes acting through this length of time have produced soil features as noted in Profile 1.



Profile 2 is an example of a typical soil profile in reclaimed prime farmland area. The mining and reclamation activity totally disrupts the soil features noted in Profile 1. Consequently, Profile 2 may contain material from different origins and also have different properties. Because of the short period of time these soils have been subject to soil forming processes, pores and channels due to plant root and animal action have only developed to a noticeable extent in the upper few inches. Structure has typically only developed in the upper few inches.

Reclaimed non-prime soils may have rock fragments within 12 to 18 inches of the ground surface causing problems for some tillage equipment. These rock fragments may work themselves closer to the surface due to freezing and thawing actions of the soil. Other concerns related to reclaimed soils are weak or nonexistent soil structure, low organic matter, limiting rooting depth, variability of texture, reduced permeability and in isolated cases low pH or soil wetness. Many of these problems are related to compaction in the reclaimed soil. Reclamation practices and moisture content at the time of soil placement greatly influences the degree of compaction. Compacted layers limit rooting depth, reduce permeability and soil wetness. Soil wetness is most likely to be a problem in flatter landscapes and swales where compacted layers underlie a layer of more permeable soil material. Thickness of the compacted layers range from a few inches to a few feet and the compacted layer occurs anywhere from the surface down. Degree of compaction ranges from slight to totally root restrictive. Compaction may occur in all soil textures, even those thought to be most desirable for plant growth such as loam and silt loam.

One of the most beneficial practices to alleviate compaction is deep tillage. Tillage devices include chisels and deep rippers. This equipment is most effective in breaking up compacted layers when the soil is dry. Other practices that help alleviate compaction are deep rooting legumes such as sweet clover and alfalfa. Crops that have lower moisture requirements such as grain sorghum should be considered where compaction reduces the ability of the soil to store and release water for plant growth.





*The success of erosion control measures will vary with different sites and must be carefully planned in advance of reclamation.*

## **Erosion and Sedimentation**

Planning for erosion control on reclaimed land may be more difficult than for areas on natural landscape because specifications and standards for erosion control practices are based on natural landscapes and soils. Reclaimed soils are typically more erosive. Factors that contribute to this problem are:

1. Slowly permeable compacted layers cause the upper soil layers to be saturated and more susceptible to detachment by moving water.
2. Slopes are often longer and more uniform than non-mined areas. Slightly and moderately developed drainage patterns common to unmined areas are not common to reclaimed soils. Also reclaimed soils do not have the benches and flats typical of many natural landscapes. Gully erosion may be less on reclaimed areas but sheet and rill erosion may increase in reclaimed areas.
3. Organic matter is usually less than in non-mined soils.
4. Structure is less developed in the reclaimed soils.

Sediment deposition patterns are often different in reclaimed areas than in natural landscapes. The long uniform slopes and absence of swales and flats on reclaimed landscape may result in most of the sediment reaching man-made ditches with little deposition in swales and on flats.

Some of the erosion control practices installed during mining operations may not be compatible with individual farming operations. They may need to be replaced with erosion control measures designed to accommodate the operation of the land user. The use of standard erosion control practices such as cover crops and crop residue management are more critical on reclaimed land.

## **Residential Septic Systems**

Because of increasing pressure for development on reclaimed soils, the Indiana State Department of Health (ISDH) investigated the use of mine soils for residential onsite sewage disposal systems. They point out that variability of soil texture can make liquid movement extremely difficult to predict in soils that have been disturbed. The compaction common to reclaimed soils reduces large pore space thus reducing permeability. ISDH also pointed out that it is difficult to determine the depth of seasonal high water table from soil characteristics observed. ISDH concluded that reclaimed prime farmland soils should not be considered for placement of onsite sewage disposal systems because of the thickness and compaction of the layered “topsoil”. However, on the other hand, they also concluded that non-prime reclaimed areas that have less than 24 inches of compacted “topsoil” do have potential for residential onsite sewage disposal systems. The County Health Department and the ISDH should be contacted for current regulations prior to building on reclaimed areas.

*Some of the erosion control practices installed during mining operations may not be compatible with individual farming operations. They may need to be replaced with erosion control measures designed to accommodate the landuser's operation.*

## Assessment of Reclaimed Land

The Indiana Real Property Assessment Manual outlines practices for assessing land. Productivity factors are calculated for the different soils based on soil properties. The most productive soil has the highest rating. The best soil in the state has a rating of 1.28 and the poorest soil has a rating of .50. Soil productivity factors were calculated for map units used to delineate strip-mined areas present before soil surveys were published for the region. The following material was taken from the State Assessment Manual that explains assessment procedures for mine lands after the soil survey was published.

**Sec.5. If coal has been strip-mined from agricultural land subsequent to the creation of the detailed soil map, the assessor shall assign a different productivity factor to the land. The assessor shall assign a productivity factor to agricultural land from which coal was strip mined subsequent to the creation of the county detailed soil map in the following manner:**

**(1) For land strip mined on or before December 31, 1977, apply a productivity factor of fifty-hundredths (.50) and identify the "Soil I.D." as "SBD7".**

**(2) For land stripped after December 31, 1977, apply a productivity factor of sixty-eight hundredths (.68) and identify the "Soil I.D." as "SAD7". (State Board of Tax Commissioners; 50 IAC 2.2-5-5; filed Sep 14,1992, 12:00 p.m.: 16IR 310)**

For further information on this issue, you should contact the State Board of Tax Commissioners or the local assessor.

## V. Questions and Answers

### 1) If I was growing corn on my property before the land was mined, will I be able to grow corn on it afterwards?

YES. If the land is classified as prime farmland and has not been exempted from prime farmland restoration standards due to grandfathering or negative determination. However, reclaimed lands may be more susceptible to drought and compaction stress requiring different management practices for successful corn production. For more information, call the Indiana Division of Reclamation.

### 2) Can I see the coal operator's plan?

YES. Once the complete permit application has been submitted it is public information. Copies can be reviewed at local public libraries in the county where the operation is located or the Indiana Division of Reclamation office in Jasonville.

### 3) How much am I allowed to participate in the permit review process?

Public participation is encouraged throughout the permit review process. In fact, public participation is encouraged from the permit process through the actual mining of the coal and reclaiming of the land. If you have any concerns or questions at any point, you are asked to contact the Division of Reclamation field office.

### 4) Where can I get more information?

All phases of the mining operation are monitored by the Indiana Department of Natural Resources, Division of Reclamation. Professional staff in the Jasonville Reclamation Field Office is always available to answer either general mining questions or specific questions about a mine in your area.

### 5) Can the DOR or OSM force a coal operator to comply with a lease agreement?

NO. Individual citizens and lessors of land to be mined should be aware that State reclamation inspectors have no jurisdiction over terms of a coal mine lease that are not specifically addressed by Indiana mining law State regulations or in the approved permit.

### 6) If a coal operator mines on my property, do I have to approve the reclamation of my land before bond is released on my land?

NO. Bond release is not dependent upon the approval of the individual landowner or concerned citizen; however, landowner comments are taken into account when determining whether the land meets the success requirements of law.

**Division of Reclamation**  
**R.R.2 Box 129**  
**Jasonville, IN 47438-9517**  
**(812) 665-2207**  
**(800) 772-6463 (toll-free only in Indiana)**  
**(812) 665-5041 FAX**



## VI. Glossary/Keywords

**acid-forming materials:** earthen materials that contain sulfide minerals or other minerals which, if exposed to air, water, or weather processes, form acids that may create acid mine drainage.

**affected area:** any land or water upon or in which mining activities are conducted or located.

**A horizon:** the uppermost mineral layer and the part of the soil in which the organic matter is most abundant and where the leaching of soluble or suspended particles is typically the greatest.

**ALJ:** Administrative Law Judge for the DNR.

**applicant:** any person seeking a permit or exploration approval from the DOR to conduct mining and reclamation operations.

**approximate original contour (AOC):** the surface configuration achieved by backfilling and grading of the mined areas so that the reclaimed area closely resembles the general surface configuration of the land prior to mining.

**B horizon:** the mineral layer that is typically immediately beneath the A horizon. The B horizon commonly contains more clay, iron, or aluminum than the A horizon or C horizon.

**C horizon:** the deepest layer of the soil profile and consists of loose material or weathered rock that is relatively unaffected by biologic activity.

**coal seam:** a bed or stratum of coal usually about 5 feet thick in Indiana.

**compaction:** the process by which soil grains are rearranged to reduce void space and bring them into closer contact with one another, thereby increasing the bulk density.

**compliance:** conducting extraction and restoration activities in accordance with terms and conditions established by law.

**DNR:** Indiana Department of Natural Resources.

**DOR:** Division of Reclamation; one of the divisions of the DNR. Regulates the mining and reclamation activities for the extraction of coal and oversees the restoration of land mined for coal, but abandoned prior to full and complete restoration.

**diverse vegetation:** two or more plant species that provide effective and permanent vegetative cover, compatible with the postmining land use, soils and climate.

**gob:** rock or other coarse materials sorted out of the coal either during mining or processing.

**graded overburden:** all of the leveled soil and rock that lies above the coal seam.

**grandfathering:** a demonstration by the coal operator that an area of prime farmland should be exempt from prime farmland restoration standards because the areas were in operation prior to SMCRA and have had continuous permits since that date.

**ground cover:** the area of the ground, which is covered by the combined aerial parts of the vegetation and the litter that is produced, naturally onsite, expressed as percentage of the total area of measurement.

**historically used for cropland:** lands that have been used for cropland for any five years or more out of the ten years immediately preceding the acquisition, including purchase, lease, or option, of the land for the purpose of conducting or allowing through resale, lease, or option the conduct of surface coal mining and reclamation operations.

**land use:** specific use or management-related activity, rather than the vegetation or cover of the land. The categories of land use are cropland, developed water resource, fish and wildlife habitat, forestry, industrial/commercial, pastureland (or land occasionally cut for hay), recreation, residential, and undeveloped land.

**litter:** the detached recognizable portions of the plants under evaluation that cover the ground surface.

**mulch:** vegetation residues or other suitable materials that aid in soil stabilization and soil moisture conservation, thus providing conditions suitable for seed germination and growth.

**Natural Resources Commission (NRC):** a statutorily established policy making body for the **DNR**.

**Natural Resources Conservation Service:** U.S. Department of Agriculture **Natural Resources Conservation Service**. The federal agency that reviews all plans of restoration of **prime farmland**. This agency conducts all soil survey activities. Formerly known as the Soil Conservation Service.

**negative determination:** a demonstration by the coal **operator** that an area of **prime farmland** should be exempt from prime farmland restoration standards because of one of the following reasons: 1) the land has not been historically used for cropland (less than five years out of the ten years prior to acquisition for surface coal mining and **reclamation** operations, 2) the slope of the land is 10% or greater, 3) the surface is very rocky or 4) the land is flooded during a growing season more than once in two years.

**Office of Surface Mining, Reclamation and Enforcement (OSM):** U.S. Department of the Interior **Office of Surface Mining Reclamation and Enforcement**. The federal agency that oversees the work of the state permitting and enforcement agency.

**operator:** any person, partnership, or corporation engaged in coal mining who removes or intends to remove more than 250 tons of coal from the earth or from refuse piles within 12 consecutive calendar months in any one location.

**overburden:** all of the soil and rock that lie above the **coal seam**.

**pH:** a symbol for the degree of acidity or alkalinity of a solution. pH values from 0 to 6.5 indicate acidity and from 7.4 to 14 indicate alkalinity. A solution with a pH of 6.6 to 7.3 is considered neutral.

**performance bond:** surety bond, certificate of deposit, letter of credit, cash, or a combination thereof, by which a permittee assures performance of all the requirements of IC 14-34 and those of the permit and **reclamation** plan.

**permit:** authorization to conduct surface coal mining and **reclamation** operations issued by the **DOR** under the State program.

**permit area:** the area of land and water within the boundaries of the permit, which are designated on the permit application maps, as, approved by the **DOR**. This area shall include all areas that are or will be affected by the surface coal mining and **reclamation** operations during the term of the permit.

**post mining land use:** use of the land after mining. The mined land must be reclaimed to the use approved by the **DOR** in the permit application and agreed upon by the landowner in the lease agreement with the operator.

**primacy:** Term for the State's authority to regulate coal mining and under **SMCRA**. **DOR** gained authority to administer federal mining and reclamation law on July 29, 1982.

**prime farmland:** lands as determined by the U.S. Secretary of Agriculture and which have historically been used for cropland.

**reclamation:** actions taken to restore mined land as required by regulations to a **post mining land use** approved by the **DOR**.

**reclamation specialists:** staff members of the **DOR** that review **permit** applications, conduct inspections for bond release, and ensure enforcement of detailed performance standards of all phases of mining and **reclamation**.

**regulatory program:** any approved state or federal program.

**renegotiate:** the act of planting reclaimed land with grasses, trees, crops, etc..

**soil amendments:** additives to the soil to enhance plant growth, such as fertilizer or agricultural lime.

**soil horizon:** each contrasting layer of soil parallel or nearly parallel to the land surface. Each soil horizon is differentiated on the basis of field characteristics and laboratory data. The three major soil horizons are the **A horizon**, the **B-horizon** and the **C-horizon**.

**soil productivity:** the capability of a soil for producing a specific plant or sequence of plants under a physically defined set of management practices.

**soil survey:** a field and other investigation resulting in a map showing the geographic distribution of different kinds of soils and an accompanying report that describes, classifies and interprets such soils for use. A soil survey must meet the standards of the National Cooperative Soil Survey.

**Soil and Water Conservation District (SWCD):** a governmental subdivision of the state, organized under Indiana Code 14-32 for the purposes of carrying out erosion and sediment control activities within the county. To carry out these activities, the **SWCD** works in cooperation with state and federal agencies with the consent of the land occupier.

**spoil: overburden** material removed from above the **coal seam** during surface mining.

**spoil ridge:** also known as “spoil bank.” Designates the accumulation of **overburden**. The place on the surface where the **spoil** is deposited.

**subsoil:** layer of soil beneath the topsoil. **B horizon**.

**substitute soil materials:** select **overburden** materials substituted for, or used as a supplement to, **topsoil**. The permittee must demonstrate that the resulting soil medium is equal to or more suitable for sustaining vegetation than the existing **topsoil**.

**Surface Mining Control and Reclamation Act of 1977 (SMCRA):** Passed by Congress to establish minimum national standards for mining and reclamation.

**swale:** a slight, open depression which lacks a defined channel that can funnel overland or subsurface flow into a drainage way.

**topsoil:** upper layer of soil, usually darker and richer than the subsoil; surface soil. **A horizon**.

*The views and information presented in this brochure are not necessarily those of the various agencies of the team members. This brochure is being provided as a public service and is intended to present an unofficial, general overview of the current rules governing coal mining on agricultural lands. The current laws and regulations of the Indiana Department of Natural Resources, Division of Reclamation are found at IC 14-36 et seq, IC 14-34 et seq and 312 IAC 25 et seq. Any inconsistency with the current laws and regulations are unintentional. This brochure cannot and does not replace or modify any statutory or regulatory requirement, nor serve as a formal or informal statement of the policies of any of the agencies listed in the document.*