

Most native soils in East Texas are very low in quality because of either claypans at shallow depths (the soil in this photo shows the distinct claypan 3 feet beneath the surface) or very deep sands. These soils only allow shallow root development and are generally unproductive for agriculture. At this lignite mine, soils were mixed during mining and reclamation. The reclaimed soils are uniform in texture, have more water-holding capacity, and are significantly more productive.



Technology Development and Transfer

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Improvement through
technical assistance,
transfer of technology and
training



▲ Of the 22,000 acres which have been mined and reclaimed at two East Texas mines, about 5,100 acres of the premine area qualified as prime farmland soils; but, approximately 14,000 acres meet the prime farmland qualification as postmine soils. In this case mining and reclamation increased the amount of prime farmland soils by about 9,000 acres.

The Office of Surface Mining provides states, Indian tribes, federal agencies, the coal industry, and citizens with the technical information and tools they need to carry out their responsibilities under the Surface Mining Law. These activities include providing direct technical assistance to address specific mining and reclamation problems, maintaining automated systems and databases used by others in making decisions under the Law, and transferring technical capability to others through training,

consultations, forums, and conferences to help them develop the skills needed for solving problems on their own. In recent years, we have been supplementing our traditional oversight presence with an increased emphasis on our role as a provider of technical assistance and support to states and tribes.

While the focus of the Office of Surface Mining's work is directed

at helping state and tribal partners do their jobs, the ultimate goal is to improve the health, safety, and the environment for our primary customers — the people who live and work in coalfield communities. The Office of Surface Mining provides information to citizens to help them better understand their rights and responsibilities under the Surface Mining Law.

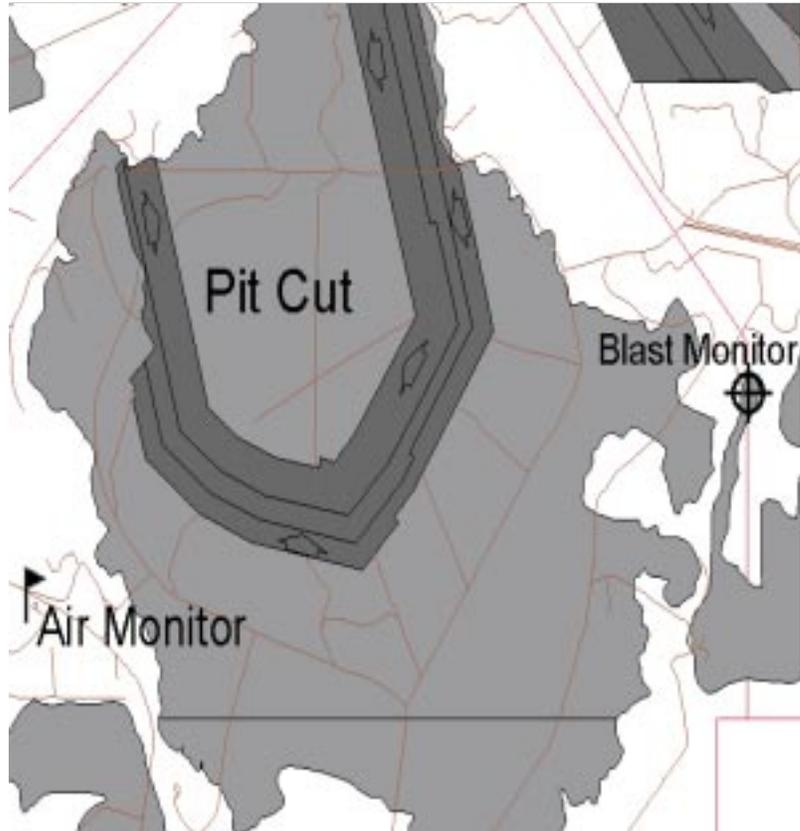
Technical Information Processing System (TIPS)

The Technical Information Processing System is comprised of off-the-shelf hardware and software supported by the Office of Surface Mining in partnership with the states and tribes. The system is maintained by the Office of Surface Mining for use by state and tribal regulators and the Office of Surface Mining staff. The system consists of UNIX and NT-based computers at state, tribal, and select federal offices networked to a centrally-located fileserver through the Office of Surface Mining wide-area network. The Technical Information Processing System suite of scientific, data base, and mapping core software aids the technical decision-making associated with conducting reviews of permits, performing cumulative hydrologic impact assessments using a watershed approach, quantifying potential effects of coal mining, preventing acid mine drainage, quantifying subsidence impacts, measuring revegetation success, assisting in the design of abandoned mine lands projects, and providing the scientific basis for environmental assessments and environmental impact statements.

In 1999, the Technical Information Processing System staff began conversion of computer systems provided to state, tribal, and federal sites from UNIX to Windows NT-based systems. The object is to accommodate more

software types, and to distribute Technical Information Processing System tools to each user's desktop. Conversion to the NT-based system began in 1999 with distribution of new hardware to state, tribal, and federal locations. The process will continue in 2000 with procurement and distribution of software to the new systems. This changeover in systems helps users keep pace with advances in both computer hardware and software. In moving the system directly to the user's desktop, use of the scientific and engineering tools is increased, enhancing electronic permitting nationwide. During 1999, work continued with state and tribal regulatory authorities in the implementation of the Electronic Permitting Initiative and Geographic Information Systems Initiative while continuing to provide daily user support for system applications. In addition, full implementation of the Hopi Land Information System was achieved, and Geographic Information System capabilities for the Navajo Nation at their Window Rock and Shiprock offices and mapping capabilities at their Tuba City office began.

Training of state, tribal, and Office of Surface Mining personnel in the practical application of the system is done on a continuing basis and is an integral part of the system operation. When space is available, the general public also attends Technical Information Processing Systems courses. This year training was reduced to allow staff to install new system components at sites throughout the country. In 1999, 121 students attended 14 classes, compared to the 352 students in 1998. This reduction occurred because of the Windows-NT platform conversion. Higher training levels are anticipated in 2000. Course offerings in 1999 included geographic information system use, global positioning system use, three-dimensional



▲ Technical Information Processing System maps such as this are used for electronic permitting. This map of the Black Mesa Mine in Arizona shows the existing mine pit, roads, areas that will be mined (shaded gray), and areas that will not be mined (unshaded).

spatial geologic and toxic-material modeling, and automated drafting and site design.

Acid Drainage Technology Initiative
The Acid Drainage Technology Initiative is a partnership which the Office of Surface Mining has joined with industry, states, academia, other governmental agencies, and groups to identify, evaluate and develop "best science" practices to prevent acid mine drainage, and to describe the best methods for preventing new acid mine drainage, and eliminating existing sources.

The National Mine Land Reclamation Center at the University of West Virginia serves as the central location for the Initiative. The Eastern Mine Drainage Federal Consortium, a group of federal agencies working in the Appalachian region, helps coordinate the federal participation. The Inter-

state Mining Compact Commission, representing eastern coal-producing states, and the National Mining Association, representing the U.S. coal industry, also participate.

While the initial focus has been on the coalfields of Appalachia, the Initiative has been expanded to include the Western states, including non-coal mining. In 1999, the Metal Mining Sector Work Group was formed to address western metal mining issues. Also in 1999, the Remediation Work Group's AMD Remediation handbook—a user manual on AMD remediation methods, was published.

This year work continued on a handbook titled *Review of Mine Drainage Prediction Methods*. This handbook, to be completed in 2000, will cover overburden testing, sampling, and field validation.

International Activities

In many countries, mining has been practiced for centuries with little regulation or noticeable concern for the environment. The successful implementation of the Surface Mining Law in the United States is a model for nations facing the challenge of protecting the environment while producing coal. In recent years, several governments have requested assistance from the Office of Surface Mining in improving their capability to administer mining and reclamation programs. In 1999, the Office of Surface Mining and state staff made presentations and assisted mining professionals from several foreign countries including South Africa, Hungary, and China.

ing perpetually-burning coal and peat fires. The fire suppression training program is fully funded by the State Department's Southeast Asia Environmental Initiative. The training follows the 1998 completion of the Office of Surface Mining's highly successful 3-year project with Indonesia's Ministry of Mines and Energy. This technical assistance project, which was fully funded by the World Bank, provided assistance to improve the country's capacity to regulate the surface coal mining industry and reclaim mined lands in an economical and environmentally-sound manner.

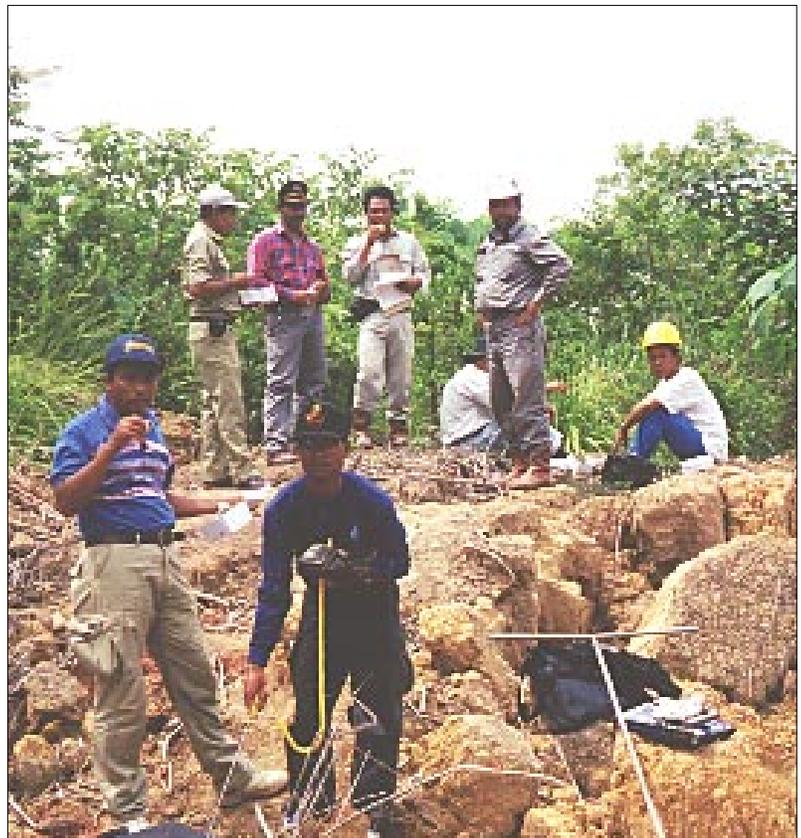
Began in September 1998, the fire suppression project provides training and technical assistance to

- Developed a fire suppression training course and a team-teaching approach that has resulted in the training of 43 professionals – from government, research institutions and private mining companies – in techniques for coal seam fire evaluation and suppression.
- Provided basic fire suppression training in Malaysia to 200 members of the Indonesian Ministry of Forestry as part of a multi-national regional training effort.
- Guided the newly-trained Indonesian professionals in extinguishing 13 coal fires in East Kalimantan, and provided direct financial support for extinguishing another 12 fires



▲ Instructor Nancy Roberts (Project Manager at the Office of Surface Mining Ashland, Kentucky Abandoned Mine Land office) on-site in Indonesia with Ministry of Mines and Energy professional staff.

▶ Training class in East Kalimantan, Indonesia on the Island of Borneo. Students are measuring a coal seam fire as part of the Office of Surface Mining technical assistance training. The subsidence and destruction of the vegetation was caused by a fire burning through a coal seam close to the land surface.



Coal and Peat Fire Suppression in Indonesia Throughout 1999, the Office of Surface Mining provided direct technical assistance to the government of Indonesia in extinguish-

the government of Indonesia in coal seam fire evaluation and suppression. Under the project, Office of Surface Mining and state regulatory staff, working with professionals from Indonesia and neighboring Malaysia, have:

that threatened the Wanariset Nature Preserve, a release area for orangutans rescued and rehabilitated following the forest fires which swept East Kalimantan in 1997.

Indonesia's Ministry of Mines and Energy has established a comprehensive coal fire suppression policy for Indonesia, and Ministry personnel are now engaged in suppressing coal fires using the training and equipment provided through the project.

The State Department's East Asia and Pacific Bureau provided 100% funding for this project as part of its East Asia and Pacific Environmental Initiative – a technical assistance effort designed to help nations in the region find solutions to environmental problems related to sustainable forest management, coastal resources conservation, and climate change. Total funding for the Office of Surface Mining is approximately \$1.5 million.

In addition to bringing valuable technical expertise to the program, the involvement of the Office of Surface Mining's state partners – Colorado, North Dakota, Pennsylvania, and West Virginia – has served as a model for Indonesia of how the close cooperation between national and regional levels of government can lead to better solutions and more efficient use of resources.

Technical Training Program

The Office of Surface Mining continued its emphasis on providing technical assistance to the states and tribes by enhancing the technical skills of regulatory and reclamation staff through training. In 1999, the program offered 49 sessions of 29 different courses. In addition to scheduled course offerings, the program also responded to requests by several states to customize courses to address their specific needs.

Special sessions were developed on

water sampling and evidence handling for Texas and Utah to meet the needs of regulatory staff, mine operators, and landowners. The Expert Witness class was tailored for West Virginia to address issues related to permit findings. A new course, "SMCRA in the 21st Century," was designed to meet the needs of program managers and staff in developing and evaluating meaningful on-the-ground performance measures. This course also seeks to enhance outreach skills, and increase the effectiveness of regulatory and reclamation programs through sharing of information about emerging technologies.

All aspects of the training program from identification of training needs through course development and presentation are cooperative efforts of states, tribes, and the Office of Surface Mining. In 1999, there were 199 instructors, – 47 percent from the Office of Surface Mining, 11 percent from

the Interior Department's Solicitor's Office, 41 percent from the states, and the remaining one percent from other sources. The 49 sessions, which reached 997 students, were presented in 27 locations in 15 states. State and tribal students accounted for 73 percent of the students, Office of Surface Mining 20 percent, and seven percent for non-government participants. The program's Government Performance and Results Act attendance goal of 900 students was exceeded by nearly ten percent due largely to attendance by non-government participants. Other new 1999 courses, include Enforcement Tools and Applications which addresses primary and alternative enforcement procedures, and Acid-Forming Materials for Program Staff which provides an introduction for program managers, staff, and attorneys in the science and technology of acid-forming materials. Training courses offered in 1999 included:



► On reclaimed surface mines, topsoil is essential for reestablishing native vegetation and crop, forage, and timber production. At this Indiana reclaimed mine site, the land is producing high yielding corn crops just as it was before mining.

COURSE NAME	SESSIONS	STUDENTS
Acid-forming Materials:		
Fundamentals	2	34
Planning & Prevention	1	19
For Program Staff	1	18
Administration of Reclamation Projects	1	23
Abandoned Mine Land Design Workshop:		
Dangerous Openings	1	10
Fires Underground & Refuse Burning	0	0
Landslides	1	10
Subsidence	1	11
Applied Engineering	2	33
Blasting and Inspection	3	52
Bonding Workshop:		
Administrative & Legal Aspects	1	19
Cost Estimation	1	18
Effective Writing	6	131
Enforcement:		
Procedures	1	22
Tools and Applications	2	43
Erosion and Sediment Control	2	41
Evidence Preparation and Testimony	2	66
Expert Witness	4	63
Historic and Archeological Resources	1	18
Instructor Training	1	23
NEPA Procedures	1	24
Permitting Hydrology	1	19
Principles of Inspection	1	18
SMCRA in the 21 ST Century	1	72
Soils and Revegetation	2	29
Spoil Handling and Disposal	1	21
Surface and Groundwater Hydrology	2	46
Underground Mining Technology	3	66
Wetlands Awareness	3	48
TOTALS	49	997

In 1999, the Office of Surface Mining, in conjunction with the Bureau of Land Management, Bureau of Indian Affairs, Minerals Management Service, Solicitor's Office, and the Office of American Indian Trust, also provided training for approximately 173 students in Indian Trust Responsibilities and Federal Obligations. The Office of Surface Mining provided the lead for development and instruction for solid minerals sessions, provided instruction on inspection and enforcement, prepared an award-winning video on sacred site issues, and developed training modules on cultural issues.

In cooperation with the Western states of Alaska, Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming, the Office of Surface Mining spon-

sored Interactive Forums on Bond Release. These forums addressed the issues related to a 10-year bond release period West of the 100th Meridian. During 1999 a Forum (second in a series of five) Approaching Bond Release: Revegetation (Native Plants, Native American Culturally/Historically Significant Plants), Reclamation Issues, and Surface Mining Applications in the Arid, Semi-Arid West was conducted. Three more Bond Release Forums are planned for years 2000 through 2002.

Applicant Violator System (AVS)

One of the underlying principles in the Surface Mining Law is that those who benefit from mining are responsible for returning the land and water to productive use. Section 510(c) of the Law prohibits the issuance of new permits to applicants who are responsible for outstanding violations until those violations are corrected. Determining whether an applicant owns or controls operations with violations is often difficult, largely due to the complexities of corporate relationships and inconsistencies in interpretations of the regulations.

The primary purpose of the Applicant Violator System is to provide state regulatory authorities with a centrally-maintained database of violation records and information on ownership and control of mining operations. State officials check the system in evaluating an applicant's mining history and eligibility for new permits. The system also is used in determining the eligibility of potential recipients of Abandoned Mine Land reclamation contracts.



◀ At this reclaimed Alabama coal mine the land was returned to forest production. Good soil handling techniques and the region's climate have resulted in the rapid development of the forest.

During 1999, the Office of Surface Mining responded to 4,553 requests for Applicant Violator System data evaluation checks from state and federal regulatory authorities, state abandoned mine land programs, and others who use the system to check violation histories. The Office of Surface Mining collected and/or settled payments in the amount of \$3,958,994 partially due to violation information in the system.

On December 21, 1998, the Office of Surface Mining published a proposal to redesign its ownership and control, permit information, and related regulations. Development of the proposed rule followed an extensive outreach effort which included numerous discussions with states, coal industry

representatives, citizens' groups, and others potentially affected by changes in these regulations. Comments on the proposed rule have been reviewed and a final rule is currently being developed.

Access to the system is available to the public, coalfield citizens, coal companies, and industry representatives through public domain software, the Internet, or by direct dial-in. As needed, the Office of Surface Mining provides training to system users on how to access and interpret information. Instruction is tailored to meet the needs of the target audience; for example, inspectors, auditors, investigators, coal industry representatives, and citizens. New initiatives completed this year include creating an Applicant Violator System Office website

and an on-line users guide. General information about the system, including access information, instructions for downloading access software, and how to obtain customer assistance can be found on the website: (www.av.sosmre.gov).

Prime Farmland
Successful reclamation of prime farmland has been a major concern to coal mine operators and citizens in the Midwest since before passage of the Surface Mining Law.

During 1999, the Office of Surface Mining provided partial funding for a prime farmland research project at the University of Illinois/Southern Illinois University Cooperative Reclamation Research Station. The research is developing a soils-based productivity evaluation method for reclaimed prime farmland soils.

In addition, Office of Surface Mining and the Agriculture Department's Natural Resources Conservation Service developed the "Specifications for soil removal, storage, replacement, and reconstruction" for mined and reclaimed prime farmland that are required by Section 515(b)(7) of the Surface Mining Law. The specifications were published in the Federal Register on June 29, 1999.



◀ This was the site of a Colorado underground mine between 1976 and 1995. Today it's a state wildlife area. In 1998, when the reclamation was complete, the company transferred the land to the Colorado Division of Wildlife.

▶ The non-forested areas in this photo were previously the principal underground mine site, including office, equipment, and maintenance buildings, parking lots, and coal-handling facilities.

Goal 3. Better Service: Strengthen the capabilities of states, tribes, and the Office of Surface Mining staff to enforce the Surface Mining Law effectively by improving service to customers, partners, and stakeholders, through open communications, technical training opportunities, technical assistance, and the transfer of technology in order to have better information and skills to make decisions.

Performance Measure	1998 Actual	1999 Plan	1999Actual
Number of students trained by the National Technical Training Program	819 students	900 students	997 students

One of the Office of Surface Mining’s most visible service initiatives is the National Technical Training Program, a cooperative effort with the states and tribes that addresses regulatory and reclamation requirements. The goal during this period of limited budgets is to maintain a level annual workload represented by the number of students trained annually. In 1999, the increase in the number of students trained reflected the following: 1) classes being shifted from both the 1998 and 2000 schedules to 1999; 2) a special session of the Expert Witness course in response to current events; and 3) cost savings that enabled more students to attend the classes.

