

**BUSINESS LINE: TECHNOLOGY DEVELOPMENT AND TRANSFER**

|                            |          | FY 2000<br>Enacted | Uncontrollable<br>Costs | Program<br>Change | FY 2001<br>Request | Difference<br>from FY<br>2000 |
|----------------------------|----------|--------------------|-------------------------|-------------------|--------------------|-------------------------------|
| Regulation &<br>Technology | \$\$\$   | 11,491             | 355                     | 0                 | 11,846             | 355                           |
|                            | FTE      | 104                | 2                       | 0                 | 106                | 2                             |
| Abandoned<br>Mine Land     | \$\$\$   | 3,536              | 63                      | 0                 | 3,599              | 63                            |
|                            | FTE      | 18                 | 0                       | 0                 | 18                 | 0                             |
| TOTAL                      | \$\$\$   | 15,027             | 418                     | 0                 | 15,445             | 418                           |
|                            | FTE<br>* | 122                | 2                       | 0                 | 124                | 2                             |

\* Additional FTE as noted above is within current program budgeting constraints.

**Operational Processes (Program Activities):** The Technical Training, Technical Assistance and Technology Transfer program activities enhance the technical skills that States and Tribes need to operate their regulatory and reclamation programs in order to effectively implement SMCRA. Thus, these program activities are an integral part of accomplishing the Environmental Restoration and Environmental Protection business lines to achieve their goals and outcomes.

**THIS BUSINESS LINE SUPPORTS BOTH MISSION GOALS OF RESTORATION AND PROTECTION BY IMPROVING SERVICE TO OSM 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**

OSM provides technical training to OSM staff, States and Tribes on a variety of topics. New technologies, changes in regulations, and staff turnover necessitate the need for continued technical training. To solve problems related to the environmental effects of coal mining, OSM provides multi-disciplinary technical assistance and works with industry, States, Tribes and the public on technical issues arising from new regulations. Other technical assistance efforts include the Technical Information Processing System (TIPS), the Applicant Violator System (AVS), Electronic Permitting (EP), and the Small Operator Assistance Program (SOAP). Technology transfer is a major part of OSM's cooperative effort with States and Tribes. OSM's

technology transfer program will continue its support for electronic permitting efforts, sponsoring interactive technical forums and workshops, providing regional technical services library, and more efficient access to COALEX (a computer-assisted library search service).

**Strategic Outcome:** Knowledgeable Federal, State, and Tribal regulatory and reclamation staff, to effectively implement SMCRA, supported by the technical training and assistance provided by OSM specialists.

**Indicator Measures:** Performance will be measured through the number of staff technically trained (including knowledge and skills taught and applied), the utilization of automated technologies (such as TIPS), and the quality and timeliness of technical assistance provided by OSM, determined via evaluations and customer service surveys.

| Table 14: Strategic Measures and FY 2001 Measures                                                                                                                                            | 1999 Actual | 2000 Enacted | 2001 Estimate | Annual Perf Goals |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|--------------|---------------|-------------------|
| <p><i>By 2002, OSM will attain a 90% customer satisfaction (or service) rate (quality, timeliness, and quantity) for efforts within this business goal.</i></p>                              |             |              |               |                   |
| <p>In FY 2001, OSM will:</p>                                                                                                                                                                 |             |              |               |                   |
| <ul style="list-style-type: none"> <li>• Attain an 89% customer satisfaction rate in the quality of our technical training.</li> </ul>                                                       | 91%         | 89%          | 89%           | 3.1               |
| <ul style="list-style-type: none"> <li>• Attain an 88% customer service rate in the quality of our technical assistance activities.</li> </ul>                                               | 98%         | 86%          | 88%           | 3.2               |
| <ul style="list-style-type: none"> <li>• Attain an 88% customer satisfaction rate for technical training in and in the use of Technical Information Processing System (TIPS); and</li> </ul> | 88%         | 87%          | 88%           | 3.3               |
| <ul style="list-style-type: none"> <li>• Attain an 88% customer service rate in the quality of our technology transfer activities.</li> </ul>                                                | 93%         | 86%          | 88%           | 3.4               |
| <ul style="list-style-type: none"> <li>• Train 900 students.</li> </ul>                                                                                                                      | 997         | 900          | 900           | 3.5               |
| <ul style="list-style-type: none"> <li>• Attain an 90% customer service rate in the quality and timeliness of Applicant Violator System (AVS) provided services.</li> </ul>                  | 96%         | 90%          | 90%           | 3.6               |

*Note:* FY 2000 goals are lower than FY 1999 actual performance. FY 1999 data collection was for a one year snapshot, therefore percentages have been adjusted to better reflect data that are representative of long-term actual customer service. We plan to maintain or improve on FY 1999 performance, but will wait to update performance goals until we have at least three years of customer service data.

**Data Verification and Validation for Measures:** Technical training measures are based on customer surveys already in place and readily available course attendance records. Measures of general technical assistance, technology transfer and AVS success will be based on customer surveys approved by OMB and in use in early FY 1999. The success of TIPS is based on customer surveys already in place.

The measures of this business line are varied, based on the diversity of activities involved in achieving this goal. The satisfaction of those customers with the quality and relevance of the technical assistance provided will be indicated by customer surveys and questionnaires. Other measures will include the number of times TIPS is used.

**Actions Required to Achieve Annual Goals:** In FY 2001, OSM plans to continue its efforts in this business line. For example, as responses are received from the customer surveys, the activities within the business lines will be evaluated to identify any needed improvements or changes. Also, TIPS, the Mine Map Repository, and AVS will increase access to users by providing more material on the Internet.

**Resources, Skills, and Technology Needed:** A goal for FY 2001 is to continue ensuring that States, Tribes, and OSM have the best available technical data and information needed to make good science-based decisions regarding mining plans, reclamation project design, permit reviews, and acid mine drainage remediation and prevention. To successfully implement the Surface Mining and AML Programs, OSM, as well as the States and Tribes, must maintain multi-disciplinary staffs that are fully competent in addressing a wide variety of technical issues that impact these programs. The FY 2001 President's Budget requests \$2.1 million for Technical Training; \$10.7 million for Technical Assistance( including Applicant Violator System (AVS)), of which \$1.5 million is for the Small Operators Assistance Program; and \$2.6 million for Technology Transfer efforts to meet the annual goals set forth above.

The request for Technical Transfer continues from FY 2000 providing \$200,000 for Acid Drainage Technology Initiative (ADTI), an ongoing effort of OSM, State and other Federal agencies, academia, and industry as part of the Appalachian Clean Streams Initiative. The objectives of the ADTI are to compile, assess, and document the "best-science" technology solutions to acid mine drainage (AMD) reclamation problems as well as to refine the most effective methods for accurate AMD prediction.

The following section details, by program activity, the funding and FTE resources required to meet the annual performance measures. It also includes examples of the types of technical training, assistance efforts, and transfer activities provided by this business line.

Office of Surface Mining Reclamation and Enforcement

**Table 15 - Justification of Program and Performance  
Technology Development and Transfer  
Summary Increases/Decreases for FY 2001  
(Dollars in Thousands)**

| Program Activity     | Regulation & Technology |        | Abandoned Mine Lands |       | Total  |        | Inc/Dec |
|----------------------|-------------------------|--------|----------------------|-------|--------|--------|---------|
|                      | 2000                    | 2001   | 2000                 | 2001  | 2000   | 2001   |         |
| Technical Assistance | \$\$\$                  | 8,152  | 2,281                | 2,299 | 10,433 | 10,700 | 267     |
|                      | FTE                     | 73     | 5                    | 5     | 78     | 78     | 0       |
| Training             | \$\$\$                  | 1,851  | 234                  | 247   | 2,085  | 2,149  | 64      |
|                      | FTE                     | 15     | 4                    | 4     | 19     | 21     | 2       |
| Technology Transfer  | \$\$\$                  | 1,488  | 1,021                | 1,053 | 2,509  | 2,596  | 87      |
|                      | FTE                     | 16     | 9                    | 9     | 25     | 25     | 0       |
| TOTAL                | \$\$\$                  | 11,491 | 3,536                | 3,599 | 15,027 | 15,445 | 418     |
|                      | FTE                     | 104    | 18                   | 18    | 122    | 124    | 2       |

## ONGOING PROGRAM

The following program activities support OSM's goal to strengthen the capabilities of the States, Tribes, and OSM staff to enforce SMCRA effectively through quality technical and scientific information, expertise, and training.

OSM's stakeholders (States, Tribes, industry) continue to express support for Technology Development and Transfer (TDT) efforts and encourage OSM to provide the types of technical support needed to effectively and efficiently meet SMCRA, the National Environmental Policy Act, and other environmental and safety laws. Cost-effective compliance will help industry remain competitive with other energy sources. Helping industry achieve up-front compliance will reduce the need for additional regulatory resources. The TDT activity described in the following pages represents those activities where OSM staff provide direct technical support to the efforts ongoing in other business lines.

### 1. Technical Assistance

This program activity provides assistance to State regulatory and reclamation staff, and to the OSM staff who review/monitor State programs, develop rules or policy, litigate SMCRA challenges or enforcement actions, or maintain other technical support infrastructure like TIPS, AVS, technical training programs, etc. Technical activities such as permit review, citizen complaint evaluation, and cumulative hydrologic impact assessment also occur where OSM is the regulatory authority. Technical work also occurs in AML project design and monitoring where OSM is responsible for AML emergency and priority projects. However, these types of endeavors are integral parts of the Environmental Protection and Restoration business lines, and are not encompassed by the TDT program activity.

OSM intends to attain an 88 percent customer service rate for its technical assistance efforts in FY 2001. Customer surveys were used during FY 1999 and FY 2000 to document the responsiveness of OSM's technical assistance to its customers in a timely and professional manner. OSM plans on continuing the use of surveys to assess our assistance efforts. By meeting the technical assistance needs, OSM can help effectively achieve the Environmental Restoration and Environmental Protection business line goals.

#### *a. Technical Policy Assistance*

OSM specialists provide technical assistance to State and OSM regulatory and reclamation policy staff. The areas of assistance include: rulemaking; citizen complaint investigations regarding the mining-relatedness of offsite impacts; guideline development; State program amendments; State mining permit evaluation; AML problem evaluation; blasting policy; prime farmland reclamation standards; coal combustion by-product disposal; reclamation bonding; threatened and endangered species; lands unsuitability determinations; participation as technical experts on interagency committees; Acid Mine Drainage (AMD) prevention and remediation; bond release and sufficiency; mountaintop mining and valley fills; permit findings; remining; subsidence caused by

underground mining; and assistance in fostering Tribal primacy by helping Tribes develop technical capabilities.

Projected activities for FY 2001 include:

- Mountaintop mining and valley fills: In steep-slope areas of Appalachia, surface coal mining operations often remove the upper portion of a mountain and deposit large volumes of overburden in engineered fills in adjacent valleys. The conditions favoring these type of operations are most common in central Appalachia, especially southern West Virginia and eastern Kentucky. In recent years, concerns have been raised regarding the impacts of these fills, especially those that covered significant segments of intermittent or perennial streams.

To inventory the scope of valley fills, assess the impacts of valley fills on aquatic and terrestrial habitat, evaluate the potential for flooding and instability, and ensure coordination between the various agencies and regulatory programs pertinent to these operations, OSM has formed task forces with other State and Federal agencies to inventory the scope of valley fills. OSM also developed technical guidelines for determination of approximate original contour and entered into memorandums of understanding with other State and Federal agencies to clarify permitting responsibilities under both SMCRA and the Clean Water Act.

Under a settlement agreement arising from litigation concerning mountaintop mining and valley fills in West Virginia, OSM and other Federal agencies are planning to: 1) prepare an environmental impact statement on the impacts of mountaintop mining with reference to the creation of valley fills and special emphasis on impacts on streams and fish and wildlife; and, 2) assist the State of West Virginia in permit review and coordinate all agencies in establishing a process for Clean Water Act (CWA) Section 404 authorization. OSM committed over 40 technical staff to these two efforts, including technical studies assessing future mining potential; evaluating the impact of mining restrictions on coal recoverability, economics, and environmental impacts; analyzing offsite impacts of mine dust and blasting fumes; valley fill hydrology; document stream conditions downstream from mountaintop mining; etc.. In conjunction with the Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the West Virginia Department of Environmental Protection, OSM anticipates completing the environmental impact statement (EIS) in FY 2001. OSM will then initiate any rulemaking or other actions deemed appropriate in light of the impact statement's findings.

- Blasting: The use of explosives is an integral part of most surface coal mining. Overburden must be broken, often through the use of explosives, before it can be removed to expose the coal for mining. Citizens living near a mine sometimes express concern about the vibrations, noise, and flyrock resulting from blasting. SMCRA and OSM's regulations

contain requirements limiting the energy of blasts, in order to protect the public and property from damage caused by blasting.

In FY 1999, following a series of blast problems at a mine in Arizona, the Western Region sent their blasting expert to observe blasting procedures and make recommendations for improvements. This process, continued into FY 2000, has yielded immediate results in that no further violations have been written, and the safety procedures at the mine have been significantly improved.

Many states, including Pennsylvania, Ohio, Alabama, Missouri, Oklahoma, and Kentucky frequently ask for OSM help in evaluating blasting damage complaints, reviewing blasting plans, or setting vibration limits to ensure the prevention of damage to property. OSM helps the states measure damage potential through field studies and set protective limits on unique structures such as historic buildings, mobile homes, hospitals, water towers, and log homes.

- Designating Areas Unsuitable for Surface Coal Mining: Section 522 of SMCRA (Designating Areas Unsuitable for Surface Coal Mining) establishes a process by which the public may petition the regulatory authority to limit or prohibit all or certain types of surface coal mining operations on non-Federal lands to protect certain features or environmental values. OSM receives and processes these petitions for all lands for which it is the regulatory authority. The decision-making process includes preparation of an environmental impact statement and a takings implication assessment. OSM is currently processing on such petition in Tennessee.

OSM is also responsible for making valid existing rights determinations under section 522(e) for all Federal lands and all lands for which OSM is the regulatory authority. Section 522 (e) prohibits or limits surface coal mining operations within certain areas, subject to valid existing rights.

Both unsuitability determinations and valid existing rights determinations require substantial technical and programmatic resources. They also involve litigation support if a takings claim is subsequently filed against the Federal government.

- Prime farmland reclamation standards: OSM is currently working with several universities to develop more efficient procedures to assess prime farmland productivity after reclamation. These procedures could result in lands being returned to landowners in a more timely manner.
- Invasive Species: Mining and reclamation activities have the potential of introducing invasive species into uninfested areas. Executive Order 13112, "Invasive Species," dated February 3, 1999, effectively requires that Federal agencies whose actions may affect the status of invasive species take appropriate action to prevent the spread of those organisms.

We are evaluating our regulations and the effect of both State and Federal regulatory programs to determine whether they adequately address our collective responsibilities under the executive order. We anticipate that this evaluation and follow-up efforts will extend into FY 2001.

- *Subsidence*: OSM technical staff have been involved with States in implementing the 1995 subsidence rules and investigating subsidence damage complaints. We anticipate that this involvement will continue into FY 2001. We also expect to initiate rulemaking in response to the 1999 remand of certain provisions of our subsidence rules.
- *Longwall mining*: Damage to homes and other structures, disruption of water wells, and effects to streams are some of the expected impacts to coal field residents while underground mining occurs beneath their communities. The Federal and State statutory and regulatory provisions require that these damages be avoided or mitigated. OSM and the Pennsylvania Department of Environmental Protection are conducting a joint study of the impacts related to longwall mining. Open surface fissures, stream/spring flow modifications, depressions/ponded water, and modified wetland delineation, and related subsidence impact features associated with longwall mining are being documented and mapped using Global Positioning System (GPS) and Geographic Information System (GIS) technologies. These mapped features and specific information about the features in a database are integrated with a map of the surface and subsurface, depicting the historical location of the active longwall panels and surface features (e.g., streams, utilities, homes, roads, etc.).
- *Acid Mine Drainage (AMD)*: Surface and underground coal mining activities expose iron sulfide minerals in rock to weathering. The interaction of these rocks/minerals with air and water can result in acid mine drainage, the number one water quality problem in Appalachia and to a lesser, but still serious, extent in other coal and hard rock mining regions. OSM technical staff resources are focused on advancing and applying the best science to remediate AMD from abandoned pre-SMCRA mines and to prevent active mines from contributing additional new sources of AMD. OSM also has contracted for an actuarial study as part of an effort to develop a reliable formula for determining and projecting AMD treatment costs. These efforts will continue in FY 2001, together with an effort to clarify bonding requirements for postmining and pollutional discharges.
- *Permit Findings*: In FY 2000, OSM and the western State regulatory authorities joined in a collaborative seminar to share the processes and documentation of permit findings that are used by each regulatory authority. OSM is developing a training workshop on permit findings to be presented in FY 2000.

b. Site-Specific Technical Assistance

OSM specialists assist in the technical aspects of compliance monitoring (including inspection and enforcement assistance), experimental practice reviews, reclamation cost estimate calculation, bond release application reviews, bond approval reviews, bond forfeiture reclamation designs, lands unsuitability determinations, surveying, revegetation, geologic sampling, AML designs, subsidence and AMD abatement, and any technical assistance on citizens complaints and ten-day notices. Below are examples of the types of assistance provided to States and Tribes.

Bond Approval and Administration: To assure that bonds are sufficient to reclaim forfeited sites, OSM ensures that bond amounts are determined using science-based, accurately calculated reclamation cost estimates, and that all legal and financial requirements are met. Bond release is an indicator of post-mining reclamation success (*see Environmental Protection*). OSM provides technical assistance and training on bonding activities, and a technical review of any issues identified in a State program's bonding activities.

In FY 1999, and continuing into FY 2000, technical specialists that comprise an OSM-wide bonding team began revising the 1987 OSM Handbook for Calculation of Reclamation Bond Amounts. To assure complete and accurate cost estimates, the handbook is being expanded to include calculations for subsidence damage repair; water supply replacement; long-term treatment of unanticipated water pollution; and adjusting for inflation. The handbook is also being revised to update costs for indirect contingency allowances and profit and overhead. Calculating costs for revegetation is being expanded. OSM staff use this handbook for operations on Indian Lands and in Federal Program States such as Tennessee and Washington. In addition, States, Tribes, industry and other Federal agencies use the handbook as a guide. The principles in the handbook are used as the basis for an OSM technical training course on reclamation cost estimating.

- An Internet (Listserv) reclamation bonding site continues its extensive use by OSM to provide technical assistance to State and Federal employees on bonding. Plans for FY 2000 and FY 2001 include designing and implementing an educational interactive query system to assist customers with questions on reviewing and approving various financial instruments used for bonding.
- During FY 1999, OSM received 75 requests for technical assistance on reclamation bonding from States, Tribes, other Federal Agencies, and the coal mining industry. Approximately 100 requests are expected in FY 2000 and again in FY 2001. Technical assistance was provided on procedures for assuring legal execution of bonding instruments; explanations about bonding mechanisms, regulations and legal forms; procedures for revising existing bonds; procedures for qualifying applicants for self-bonding; financial statement review; and procedures for estimating reclamation costs.

- In FY 1999, OSM completed special on-site bonding training for Alaska on reclamation bonding. The training included bond review procedures, legal forms, bonding regulations, security and tracking. In addition to the State's coal mining program, staff from the minerals mining program, environmental, and land management programs requested and received this training as well. OSM anticipates receiving approximately two requests for on-site bonding training in FY 2000 and the same for 2001.
- In FY 1997, OSM completed a comprehensive bonding database system for Ohio to track bond instruments, monies, and bond releases. Modifications were started in FY 1998 and have continued into FY 2000 to address revisions to Ohio's Regulatory Program and to make the database system compatible with Ohio's permitting and other database systems.

Hydrologic Balance Issues from Underground Mining: Over a century of extensive underground coal mining in Pennsylvania and West Virginia have left miles of interconnected, flooded workings, called mine pools. The water level in these mine pools may rise and overflow into streams or could potential create a mine "blowout," which may result in rapid, and sometimes catastrophic, discharge of large amounts of stored mine water—often AMD.

For instance, the Fairmont Mine Pool covers more than 27,000 acres comprised of several pre- and post-SMCRA mines. These mines, which have filled with mine drainage, threaten to discharge into the Monongahela River. EPA Region III, OSM, and West Virginia are cooperating on a study to delineate the extent of these pools, identify discharge points, and, ultimately, develop strategies to prevent degradation of streams from potential discharges. During FY 1998, OSM installed a monitoring network of boreholes to assess the fluctuating pool levels and allow modeling of the hydrology of the pool. In FY 2001, OSM plans to extend the monitoring network northward to other mined-out areas and join forces with the USGS in increasing study efforts beyond the West Virginia assessment. This study will assist Pennsylvania, West Virginia, other states, OSM, and EPA to evaluate possible regulatory solutions to protect the hydrologic balance from future "Fairmont Pools."

c. Mine Map Repository

OSM maintains a mine map repository authorized under the former Bureau of Mines and subsequently transferred to OSM. This repository, located in OSM's Appalachian Regional Coordinating Center in Pittsburgh, Pennsylvania, maintains the only national inventory of abandoned coal and non-coal mine maps throughout the United States. This is an official collection of the latest activity which in some cases dates back over a century. Mapping information is used to fulfill customer requests for unique information that can range from rare maps for small uncommon projects to a national collection for assisting in large interstate projects. The cost of providing maps to non-Federal entities is charged to the requester.

OSM customers include State regulatory and reclamation staff, local government agencies, developers, engineering and mining companies, architects, universities, law firms, environmental

consultants, pollution control boards, realtors, law-enforcement agencies, historical societies, and homeowners.

The repository is automating its operational process. The new technology will enable OSM customers to retrieve mine maps and related information more efficiently via the Internet. Future enhancements are planned through partnering with the United States Geologic Survey (USGS). Operating revenues will increase due to a new and revised fee schedule for business clients.

*d. Small Operators Assistance Program (SOAP)*

Section 507(c) of SMCRA authorizes that up to \$10 million may be appropriated each year from AML Fund fees to assist eligible small operators by paying certain costs associated with obtaining hydrologic, geologic, and other environmental information needed to prepare coal mining permit applications. Public and private laboratories under contract to regulatory authorities collect the data and provide the environmental analyses. Mine operators with annual coal production of less than 300,000 tons per year are eligible for assistance under SOAP.

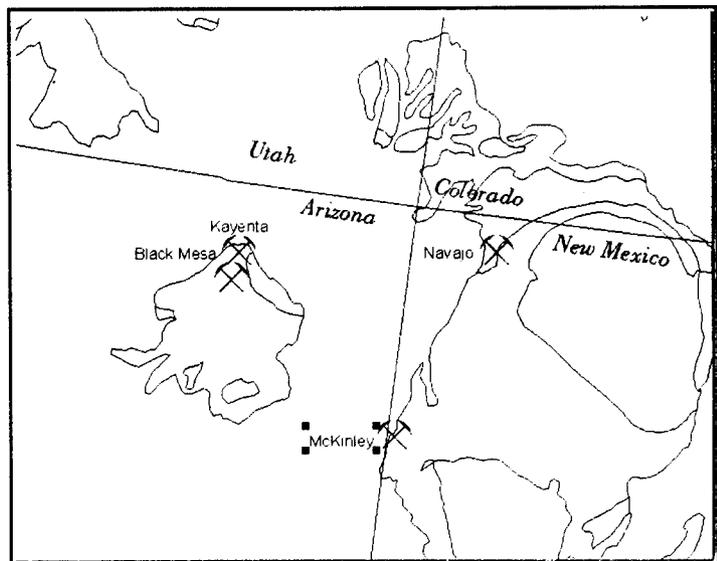
States with approved regulatory programs are responsible for administering SOAP. They receive grants from OSM to pay qualified laboratories to provide the technical services authorized under the program. As the regulatory authority for non-primacy States, OSM is responsible for SOAP programs in Georgia, Tennessee, and Washington. In FY 1999, 121 operators were assisted by SOAP. Most activity has occurred in the eastern coal-producing States of Pennsylvania, Kentucky, West Virginia, and Ohio. In FY 1999, the States of Alabama and Arkansas initiated SOAP programs. Over 3,000 operators have benefitted from SOAP since its initiation.

Administration and monitoring of SOAP grants by OSM staff is funded under the Environmental Protection business line. The FY 2001 request for SOAP is \$1.5 million.

*e. Permitting:*

*West Virginia Permitting Assistance:* OSM staff are working with West Virginia permitting staff to review mountaintop mining permits involving valley fills in greater than 250-acre watersheds. During FY 2000 and 2001, OSM anticipates working with West Virginia to develop technical and programmatic guidance documents for use in the permitting process.

*Western Region Coal Mine GIS:* OSM staff have begun developing a



*Mine locations and coal fields on the prototype western mine GIS*

Geographic Inventory of Western Coal Mines where OSM is the regulatory authority. The information includes locations, acreage, ownership, production data, bond status, and mine maps. A user will be able to view a map with these coal mine locations shown, zoom in on an individual mine or mines, and view permit application maps and information. This effort will continue in FY 2001.

*Iowa Subsidence Impacts Analysis:* OSM used TIPS software, ARC/INFO and ArcView, and the nationwide TIPS network to develop specialized map products for a public meeting with homeowners in Des Moines, Iowa, where mine subsidence was raising fears of property damage and safety hazards. The detailed maps were useful in explaining why only one home was damaged and why damage to additional homes was unlikely. Data used to produce maps was pulled in various electronic formats from USGS, the Iowa Geological Survey and OSM. TIPS made it possible to use this varied data to produce maps and tables without time-consuming data reentry and reformatting. No further public concerns were voiced following the public meeting.

*f. Technical Information Processing System (TIPS)*

TIPS, designed by OSM in close cooperation with the States, consists of a centrally-located super minicomputer networked through OSM's Wide-Area Network with sophisticated workstations and off-the-shelf software in State, Tribal, and selected Federal offices. TIPS includes a team of multidisciplinary professionals that provide a variety of services to TIPS customers, including:

1. Training Program
2. Software and Hardware Support
3. Research and Development
4. Provide Technical Assistance when requested

TIPS assists in mine permit reviews, preparation of CHIAs, demonstrating revegetation success, design of abandoned mine land projects, and the preparation of environmental assessments and environmental impact statements. TIPS is a key element in the implementation of the OSM Electronic Permitting Initiative and GIS Initiatives on Federal and Tribal lands and in the States.

TIPS has been fully operational since 1989 and is being used extensively by States and OSM offices. The States continue to expand the use of TIPS on Title V permitting and inspection issues and for the design of Title IV reclamation projects. With the expanding use of the TIPS tools, the States are generating higher quality permit reviews in shorter times and are able to produce quality Title IV reclamation designs much quicker.

OSM intends to attain an 88 percent customer satisfaction rate for its TIPS efforts in FY 2001. Since FY 1998, surveys were issued for the variety of assistance offered by TIPS through its networked computer system with the States and OSM, and its computer applications training program.

TIPS Website: The TIPS website ([www.tips.osmre.gov](http://www.tips.osmre.gov)) provides information about TIPS, including current TIPS training classes, descriptions of TIPS software, access to digital data files for public domain TIPS software, standardized AML emergency design drawings, and digital topographic maps for coal-producing areas within the United States.

*g. Reclamation Support Activities:*

Oklahoma AMD Remediation: The State of Oklahoma Conservation Commission (OCC) and cooperating Federal and State agencies are conducting a scientific study and a planning effort to develop a series of acid mine drainage abatement projects in the Gaines and Brushy Creek watersheds near Hartshorne, Oklahoma. AMD discharges from underground and surface mines are impacting the water quality of these streams and portions of the Corps of Engineer- managed Eufaula Reservoir. OCC is seeking funds from both the Corps and OSM Clean Streams Initiative to support the planning and remediation efforts. In support of these efforts OSM and OCC are using TIPS software tools to model the topographic and subsurface geology of the watersheds. Through the use of TIPS modeling capability the agencies will predict the effect of ground water recharge from surrounding, reclaimed surface mines on mine pool level. This will in turn, will be used to predict the effects on the quality and amount of AMD discharge.

Tennessee GIS: TIPS computer software and the TIPS computer network is being used by the Knoxville Field Office (KFO) to construct a Geographic Information System for the coal field in Tennessee. Presently in the early stages of development, this system will contain digital data sets which will allow KFO specialists to model various scenarios and visually examine possible consequences. Future applications of this system may involve areas of permitting, hydrologic impact assessments, environmental impact assessments or analyses of coal mining operations, facilitating bond release determinations, and determining reclamation status.

Inspection Support: TIPS is providing GPS and GIS support to this new initiative starting in FY2000 to timely monitor and verify progress in reclamation leading to bond release on mine sites. GPS data will be gathered during inspections that will allow for analysis of reclamation success, and serve as the basis for precision GIS mapping of bond increments.

Pittsburgh Coal Seam Model: OSM is modeling the Pittsburgh coal seam for the northern two-thirds of the Appalachian bituminous coal basin. Using TIPS software and workstations, the monumental project includes mine mapping and prediction of acid-drainage problems.

Washington AML Program: The Federal AML program in Washington employs Global Positioning Satellite (GPS) equipment to accurately locate abandoned mine shafts in and record field data such as shaft dimensions, depth, and condition. The use of this data is two-fold: (1) the database and maps provide a valuable AML project management tool, and (2) the data base will ultimately be provided to municipalities for use in planning and zoning. TIPS GPS and GIS training was provided to support this effort.

*h. Applicant/Violator System (AVS)*

The primary purpose of the Applicant Violator System (AVS) is to provide State and Federal regulatory authorities with a centrally maintained national database containing information related to ownership and control of surface coal mining operations and outstanding violations incurred by those operations. Regulatory authorities check the AVS to evaluate an applicant's mining and violation history and eligibility to receive new permits. OSM receives approximately 4,000 requests each year for reports for use in the review of pending permit applications. OSM and the States also use the AVS to determine the eligibility of potential recipients of AML reclamation contracts.

In addition, the Bureau of Land Management, the Mine Safety and Health Administration, the Internal Revenue Service, the National Labor Relations Board, and the Small Business Administration use the AVS for assorted purposes. The Tennessee Valley Authority uses the AVS to avoid purchasing coal from persons with outstanding violations of SMCRA. The coal industry, citizen groups, and the general public routinely use the system to verify corporate information and the status of violations.

OSM conducts or assists State regulatory authorities and other Federal and State agencies in conducting ownership and control investigations, negotiating and tracking settlement agreements, responding to coal operators' rebuttals of agency decisions on ownership and control, and resolving conflicts concerning information in the AVS. These efforts will continue during FY 2001.

**2. Technical Training**

*a. National Technical Training Program*

OSM established the National Technical Training Program in 1985, recognizing the need for an ongoing educational program to increase the technical competence and professionalism of Federal, State, and Tribal personnel. The program delivers training related to permit approval, bond release, reclamation, and enforcement. The program updates technical expertise and fosters consistent application of standards. Disciplines involved in enforcement of SMCRA include engineering, hydrology, blasting, agronomy, and botany. Staff must also have the ability to gather evidence and testify in court. In addition, periodic training is needed to disseminate the latest technological and other changes in regulatory and associated reclamation activities.

Without a comprehensive technical training program, significant problems would likely develop in regulatory and reclamation program implementation such as:

- limited comprehension of on-the-ground conditions, inaccurate field testing, or misinterpretation of test results could lead to:
  - delayed or improvidently issued permits,
  - incorrect violation citations,

- bond release problems.
- poor handling of evidence, incomplete documentation, or poor testimony could lead to invalid enforcement actions.
- AML project designs may not be optimal and could result in added cost or decreased efficiency.
- lack of knowledge of safety procedures on active and inactive sites could result in personal injury.

To help avoid these controllable consequences, OSM's recognizes the need to provide training to States, Tribes, and OSM personnel. All aspects of the training program, from needs identification through course development and presentation, are a cooperative effort of State, Tribal, and OSM offices. Each year, OSM surveys all State, Tribal, and OSM offices to determine their technical training needs.

In FY 1999, the training program offered 49 sessions of 28 courses for 997 participants of which 47 percent of the instructors were from OSM, 41 percent from States, 11 percent from Solicitor's offices, and one percent from other sources.

A course in Acid Forming Materials for Program Staff was added in FY 1999 to program offerings as was a new course in Enforcement Tools and Applications, which facilitates implementation of the new ownership and control rule. Another new course was developed and offered to enhance a common understanding between the States, Tribes, and OSM of SMCRA, GPRA, regulatory and reclamation program requirements. Several special course sessions were offered to assist in understanding rules of evidence and proper water sampling techniques.

In FY 1999, the training program exceeded its target customer satisfaction rate of 89 percent by 2 percent. In FY 2000 and FY 2001, OSM intends to meet its 90 percent customer satisfaction rate for its national training efforts and provide training to approximately 900 students.

In FY 2001, OSM will develop and pilot a new course on permit findings to enhance permitting staff skills. A new course also will be developed in Historical and Archeological Resources to provide up to date information on recently revised Section 106 of the "National Historic Preservation Act.

*b. Regional/Site Specific Training*

OSM has regional training centers, which offer classes on area-specific topics and provide facilities for the national training program to minimize travel expenses. In FY 2000 and FY 2001, examples of such training may include:

- *Tribal Training*: OSM offers training to tribal staff in formal OSM training classes (NTTP and TIPS) as well as through courses offered by State universities and attendance at OSM

forums and workshops. This effort is carried out under provisions of the Energy Policy Act of 1992, which includes:

(1) courses relating to SMCRA to assist the Tribes (Navajo, Hopi, Crow and Northern Cheyenne) in their development of regulations and programs for assuming the regulation of surface coal mining and reclamation operations on Indian lands.

(2) courses to enable the Tribes to assist OSM in the inspection and enforcement of surface mining activities on Indian lands, including, but not limited to, permitting, mine plan review, and bond release.

- Advanced Applied Statistics Training: In FY 1999, three advanced statistical workshops were conducted for State and OSM staff on the application of statistics to the review and analysis of permit application and bond release application data: Topics in Statistical Analysis for Environmental Monitoring Associated with the Surface Mining Control and Reclamation Act; Regression Analysis; and Statistical Sampling for Baseline Studies, Bond Release and Monitoring Studies. The three workshops provided advanced statistical analysis technology to a total of 76 attendees.

In FY 2001, statistical expertise will become more important as final bond release applications are considered by OSM and the States. This course is an effort by OSM and certain States to build familiarity with advanced statistical techniques among the mining regulatory community to enable it to better cope with bond release proposals, especially those developed under the direction of professional statistics consultants working for industry. OSM will also continue to provide advanced applied statistics courses to deal with soils, vegetation, and hydrology issues in the arid and semi-arid western States.

- AML Inventory Training: During 2000, OSM conducted three AML Inventory courses to train State and OSM personnel in inventory methods, priority selection and the use of the enhanced AMLIS computer system. State Program support and training on Inventory issues will continue during 2001.
- TIPS Training: In FY 1999, 121 technical professionals from the States, Tribes, OSM, and industry were trained in 14 classes under the TIPS computer applications training program. Most of these courses (11) were held at OSM's regional computer training facilities. An additional three special request courses were conducted at trainee sites.

For FY 2000, the TIPS training program has scheduled 15 classes to be held at regional training centers, and at least sixteen classes are to be conducted at trainee sites.

### 3. Technology Transfer

A sound technical development program ensures that the most current and valid scientific information is available to the industry, States, and Tribes. In FY 1999, OSM began using customer surveys to measure the success of its Technology Transfer activities. OSM plans to attain an 88 percent service rate in FY 2001.

#### *a. Technology Development*

OSM seeks to meet the needs of State, Tribes, and all OSM staff, as well as the public and the coal industry by solving problems related to reclamation projects, and regulatory implementation through cooperative research efforts with other bureaus. OSM does not fund research of its own. OSM's research needs are coordinated with the regulatory and research programs of USGS and other Federal agencies having responsibility for or supporting environmental protection.

OSM participates on the Department of the Interior's Base Mapping Needs Committee to coordinate OSM's mapping needs with other Interior bureaus. The Base Mapping Needs Committee ranks and funds mapping requests based on multi-party needs.

OSM works with the academic community and private research organizations to identify potential areas of cooperation. The National Mine Land Reclamation Center (NMLRC), located at West Virginia University, receives funding from several Federal and State agencies including OSM and industry organizations to research solutions to environmental problems associated with coal mining.

An industry/government (State and Federal) academic task force developed joint action plans to define "best science" practices that are expected to solve AMD problems, and to work toward implementation of those practices throughout the coalfields. Cooperative efforts involving many agencies, groups, and individuals are implementing the Acid Mine Drainage Technology Initiative (ADTI). NMLRC acts as the coordinator.

The National Mine Land Reclamation Center acts as the Executive Secretariat for the ADTI cooperative effort. In FY 1999, the National Mine Land Reclamation Center issued an AMD technical solutions handbook. In FY 2000, it will issue a handbook on AMD prediction methods. Both will be updated periodically as the science related to AMD progresses. In FY 2001, field validation of technical approaches used to control AMD will be a focus of the ADTI.

#### *b. Electronic Permitting*

The goal of Electronic Permitting is to obtain computer-generated permits in which all text, baseline data, models, drawings, and maps are in electronic media. The permits can be loaded onto the regulatory agency's local area network for review and specific items can be loaded into the

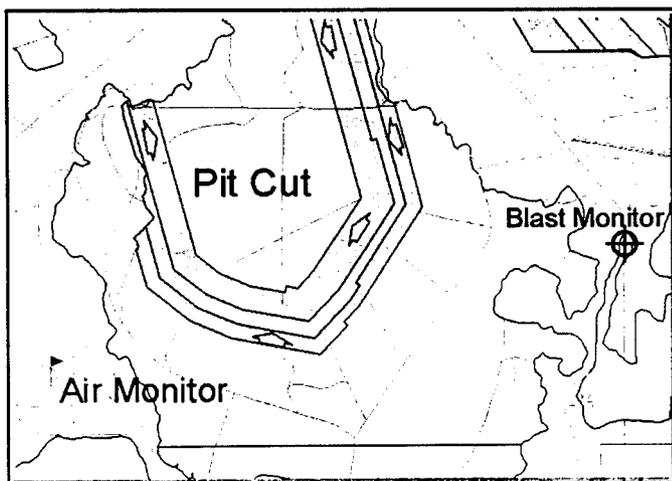
agency's databases. This will simplify the transfer of information with our citizen and industry stakeholders during the permitting process.

Electronic permitting is expected to result in improved coal mining permits nationwide. Specifically, electronic permitting will significantly reduce the time required to access, analyze, review, and approve permits, and provide for informed and environmentally-sound science-based decisions. Data and information can be downloaded directly into computer databases and analytical software, such as TIPS, making data manipulation and analyses more efficient and accurate. Electronic permitting saves staff time by reducing many of the "clerical" aspects of accessing and transferring hard copy information.

In FY 2001, OSM plans to continue to: (1) coordinate activities with primacy States, Tribes and industry; (2) expand technology to OSM Field Offices; (3) sponsor interactive forums, training and workshops for primacy States, Tribes and industry; and (4) implement prototype Federal/Industry electronic data exchange initiatives. OSM will continue to support States' electronic permitting initiatives through its Technology Development and Transfer efforts .

Examples of electronic permitting achievements include the following:

- North Dakota received its first coal mining permit application in both hard copy and fully electronic format on a CD, allowing the Reclamation Division of the North Dakota Public Service Commission to conduct much of the permit review and evaluation electronically.
- Alaska received its first coal mining permit application in electronic format.
- In cooperation with OSM permitting staff, Peabody Western Coal Company has provided both permit text and permit map data in electronic format to facilitate timely review of their Arizona Indian Lands permits.



*GIS Map data from Peabody's Black Mesa Mine*

- In this manner, scientific and engineering personnel at OSM are able to receive complex data from the permit applicant within seconds of requesting the information. OSM's efforts to advance the electronic permitting process will hopefully make this process more widespread and increase the efficiency of permitting in the future.

- Mississippi continues to utilize electronic submittals of permit revisions as part of their permit administration process.
- To facilitate the development of electronic permitting among eastern states, OSM has established the Appalachian Regional Electronic Permitting Team (AREPT), comprised of state representatives and OSM regional staff.

c. Technology Transfer and Publications

Technology Transfer is accomplished through a variety of activities. State technical representatives meet frequently with OSM regional staff to share resources whenever practicable to resolve regional technical issues. OSM sponsors or attends interactive technical forums, computer applications workshops, and technical seminars to address mining and reclamation environmental issues. After coordinating the needs of States, Tribes, and industry, OSM plans and presents technical topic forums. The following describe the types of forums:

Bond Release: The second in a series of five Interactive Bond Release Forums on Arid and Semi-arid Areas was conducted in September 1999. This forum was entitled "Approaching Bond Release: Revegetation/Native Plants and Native American Cultural Plants Used for Reclamation and Surface Mining Applications in the Arid, Semi-arid West". A series of three additional bond release forums are scheduled through FY 2002.

- FY 2000 topic: Approaching Bond Release: Cumulative Hydrologic Impact Assessments (CHIA) and Hydrology Topics for Reclamation and Surface Mining Applications in the Arid, Semi-arid West
- FY 2001 topic: Approaching Bond Release: Wildlife Habitat Construction for Reclamation and Surface Mining Applications in the Arid, Semi-arid West
- FY 2002 topic: Approaching Bond Release: Post-mining Land Use (PMLU) for Reclamation and Surface Mining Applications in the Arid, Semi-arid West

Reforestation Initiative: OSM has embarked on an effort to encourage reforestation practices to increase the amount of mined land reclaimed to forest. This effort has resulted in technical and policy symposiums transferring state-of-the-art science and technology. Beginning in FY 2000, and continuing through FY 2001, OSM will work to make reforestation a more desirable and effective post mining land use, consider establishing a national award for reforestation, develop a technical training course on reforestation, and provide State-specific technical assistance.

The Use and Disposal of Coal Combustion By-Products at Coal Mines: A Technical Interactive Forum - OSM is cosponsoring, with the U.S. DOE Federal Energy Technology Center and

Southern Illinois University, a forum that will focus on communicating the state of the art on CCB Basics, their Regulatory Status, Beneficial Uses at the Mine Site, and Hydrologic Issues. The forum will take place in April 2000 in Morgantown West Virginia.

*Reports and Workshop Proceedings:* Various reports and workshop proceedings are made known to the public by means of a database available on OSM's homepage. OSM uses the Internet to make available and seek comments to a resource document covering the water protection provisions of SMCRA and reached a wide client audience. In FY2001, OSM intends to continue to post resource documents and other technical information available to all interested parties via the OSM homepage and will place links on its homepage to other sites containing technical information related to mining and reclamation and related topics.

*OSM Technical Library:* OSM maintains a technical library in its Western Regional Coordinating Center located in Denver, Colorado, which houses reference materials and a collection of scientific and technical materials. The library projects that it will receive approximately 300 requests in FY 2000 and again in FY 2001. As well as providing technical information and services to State Regulatory Agencies and other OSM customers on a variety of mining-related topics, the technical library shares its collection through interlibrary loan with libraries around the world.

d. Experimental Practices Program

Section 711 of SMCRA allows variances from Sections 515 and 516 performance standards as alternative or experimental mining and reclamation practices to encourage advances in mining technology or to allow innovative industrial, commercial, residential, or public (including recreational) post-mining land uses. However, the experimental practices must at least be as environmentally protective as would have been required by the performance standards promulgated under Sections 515 and 516 of SMCRA. The experimental practice also must not reduce the protection afforded public health and safety below that provided by the applicable performance standards. Approval and monitoring of a permit containing an experimental practice requires a close working relationship between the operator, the regulatory authority, and OSM. OSM provided technical and administrative assistance to Utah on a proposed topsoil protection experimental practice, and subsequently, approved the proposal in FY 1999.

Since the inception of the program, 33 experimental practices have been approved. Fourteen were determined to be successful and three unsuccessful; seventeen have been closed out; one was terminated due to regulation change. The remainder of the experimental practices are in various stages of completion with six that have been completed, but for which a final report has not yet been submitted.

OSM anticipates that six new experimental practices may be submitted by Virginia, Kentucky, and Utah in FY 2000. It is likely that the interest in experimental practices will continue, and similar numbers are expected in FY 2001.

*e. Educational Outreach*

In order to make the public, elementary school through college students, as well as foreign visitors aware of OSM's responsibilities and of its environmental stewardship mission, OSM staff provide educational outreach to the Science Teacher's Associations, science classes, educational fairs, Earth Day events, career days, foreign visitors, grassroots organizations, and professional associations and societies. This outreach includes demonstrating surface mining reclamation using an open-pit mine model with reclamation equipment and activities in place; and providing educational posters and materials about the same.

**Justification of Program Changes:**

| Technology Development and Transfer | FY 2001 Budget Request | Program Changes (+/-) |
|-------------------------------------|------------------------|-----------------------|
| \$(000)                             | 15,445                 | 0                     |
| FTE                                 | 124                    | 0                     |