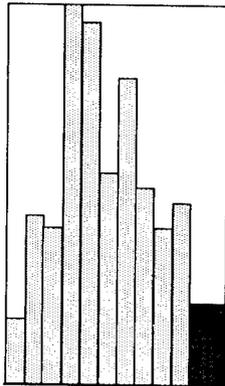


5. TECHNICAL ASSISTANCE

RESEARCH



Number of Research Projects Funded 1978-89

To enable mine operators and State and federal regulators to do a better job of handling everyday problems arising when implementing SMCRA, OSM conducts research studies to provide solutions to such problems. Studies are directly related to the implementation of Title V regulations affecting active mining operations. The research is short-term, providing practical answers to specific problems. In FY 1988 OSM provided \$883,000 to universities for the completion of the following projects:

- Development of a procedure to determine the integrity of surface water quality in streams of coal-producing regions.
- Evaluation of the relationship of compaction and soil physical parameters to the productivity of reclaimed soils.
- Development of techniques to reduce soil compaction in reclaimed soils.
- Development of a surface mining data base and data-base management system for storage, manipulation, and retrieval of surface mining data.
- Maintenance of compaction alleviation in mineland soil.
- Modification of the Baker Soil Test to provide efficient, successful establishment of vegetation on mine soils.

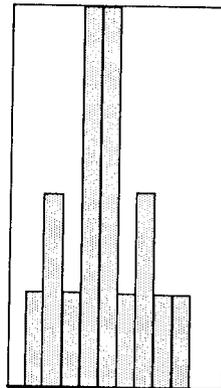
In FY 1989 OSM research funding decreased to \$700,000 and included the following projects:

- Evaluation and quantification of risk confronted by surety companies underwriting reclamation bonds.
- Use of productivity indices to estimate the yield potential of disturbed soils.
- Evaluation of parameters affecting acid mine drainage production on a micro, field, and regional scale.

- Improving the characterization of sulfur in overburden and coal using state-of-the-art technology.
- Indices for indirect estimates of productivity of three crops.
- The effect of alternative and reclaimed areas on the value of wetlands.

Projects completed during FY 88-89 resulted in eight contractor publications listed at the end of this section and identified with an asterisk. These publications and other technical reports are distributed upon request from OSM Eastern and Western Field Operations. Published reports are available from the National Technical Information Service (NTIS).

EXPERIMENTAL PRACTICES



Experimental Practices Started 1978-89

Section 711 of SMCRA allows alternative experimental mining and reclamation practices that do not comply with section 515 and 516 performance standards, as a way of encouraging advances in mining technology or of allowing industrial, commercial, residential, or public postmining land uses. However, the experimental practices must be shown to meet all other standards established by SMCRA, and to maintain protection to the environment and the public. Approval and monitoring

of a permit containing an experimental practice results in a close working relationship between the mine operator, the State, and OSM.

Although there were no experimental practices initiated during the FY 1988-89 period, 3 practices were completed. These projects included:

- A small excess spoil fill constructed with no underdrains on top of existing soil (SIMCO mine, Peabody Coal Co., Ostego County, Ohio). To date, the spoil fills have shown no signs of slippage or weakness. The final appearance of the fill is a valley with gentle slopes that blend with the surrounding terrain. The experimental practice resulted in geotechnically stable fills and the savings in mining and reclamation costs by the operator were substantial.
- Development of a wetlands habitat over a slurry pond without the standard four feet of non-toxic and

non-acidic cover (Ayrshire Mine, AMAX Coal Co., Warrick County, Indiana). The 57-acre slurry impoundment has resulted in 37 acres of wetlands. Two zones produce an excellent environment for establishing a diverse community of shoreline emergent, submerged, and floating wetland vegetation. OSM considers this experimental practice highly successful and is urging further demonstration of this practice to provide sufficient data to substantiate regulatory change.

- Alternative excess spoil and drainage control practices (Amos Ridge Mine, Amos Ridge Coal Co., Wise County, Virginia). The Amos Ridge operation has received awards for its quality of reclamation, and the media has focused much favorable attention on the site. One reason is the land use potential of the reclaimed experimental practice site where steep pre-mining slopes were replaced with extensive near-level areas. Such flat lands are particularly important in this area where steep topography limits land use and non-coal economic development.

INDIA PROJECT

In 1984, through the United States-India Fund (USIF), OSM received Rupees equivalent to \$420,000 for mining and reclamation technology transfer. Working directly with the Government of India, OSM planned three research projects:

- A conceptual environmental management plan for the Jharia Coal Field, including reclamation of existing unreclaimed lands in operation for approximately 100 years.
- A conceptual environmental management plan for the Singrauli Coal Fields. This project will result in the development of contemporaneous reclamation standards for a relatively new coal field.
- An environmental model for water quality resulting in treatment facilities for improved water quality in the Jharia Coal Field. The Environmental Protection Agency (EPA) is assisting with this project.

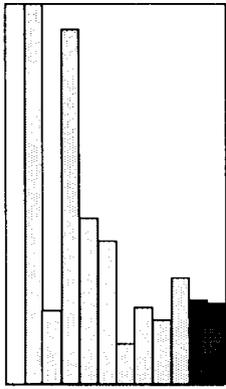
During 1988-89, OSM signed contracts with the Government of India to begin the work. Workshops to provide training in development of environmental management plans have been organized and are scheduled for presentation by OSM technical staff early in 1990.

TECHNICAL TRAINING

In FY 1988, nationwide training of federal, State, and private surface coal mining regulatory and abandoned mine land personnel continued. One new course, Historic & Archeological Preservation, along with 11 existing courses, made up the curriculum that was attended by 1,272 participants at 60 sessions. The existing courses were: Applied Hydrology for Permit Review; Blasting and Inspection; Enforcement Procedures; Engineering Principles for Program Personnel; Instructor Training; Management, Operational Development and Evaluation; Remote Sensing; Soils and Revegetation; Surface and Groundwater Hydrology; Technical Writing; and Underground Mining Technology and Effects.

In FY 1989, 11 courses were offered, including two new courses on Inspection for Bond Release, and Spoil Handling and Disposal Practices in Steep Slope Areas. Attendance by State personnel increased to 82 percent of this year's enrollment; 1,249 participants attended 60 sessions.

Small-Mine Operator Assistance Program (SOAP)



Soap Funds Expended
1978-89

Section 401(b)(1) of SMCRA authorizes up to 10 percent of the fees collected for the Abandoned Mine Reclamation Fund to be used for technical assistance to help qualified small mine operators obtain technical data needed for permit applications. Operators who produce more than 250 tons but less than 100,000 tons of coal per year are eligible for assistance. SOAP helps operators meet requirements for determination of the probable hydrologic consequences of proposed mining operations and gives

them a statement of the results of test borings or coal samplings. The "determination" is an analysis of the effect of the proposed operation on the quantity and quality of surface and ground water. The "statement" is

an analysis of the overburden, coal, and affected aquifers and clay zones below the coal needed to provide information on their chemical and physical makeup, especially if acid- and toxic-producing materials are present.

The data are collected and analyzed by qualified laboratories and consulting firms. OSM originally approved 379 laboratories throughout the U.S. Qualification of laboratories is now accomplished by the State regulatory authorities.

Regulations for SOAP place responsibility for the program with the States that have approved permanent programs. In States with federal programs, OSM operates a SOAP. Small operators receiving assistance totaled 156 in 1988 and 153 in 1989. Table 13 provides a breakdown of SOAP grant awards by State and Indian tribe during fiscal years 1988 and 1989.

Table 13
Small Operator Assistance Program
Fiscal Years 1988 and 1989 Grant Awards

State or Indian Tribe	FY 1988	FY 1989
Alabama	\$0	\$0
Alaska	0	0
Arkansas	0	0
California	0	0
Colorado	0	0
Georgia	0	0
Illinois	20,000	20,000
Indiana	67,000	42,000
Iowa	0	0
Kansas	0	0
Kentucky	0	0
Louisiana	0	0
Maryland	0	25,000
Missouri	0	0
Montana	0	0
New Mexico	15,000	0
North Dakota	0	0
Ohio	0	510,000
Oklahoma	0	0
Pennsylvania	1,300,000	750,000
Tennessee	0	0
Texas	0	0
Utah	40,000	0
Virginia	60,000	20,000
Washington	0	0
West Virginia	90,000	186,000
Wyoming	0	0
Crow Tribe	0	0
Hopi Tribe	0	0
Navajo Tribe	0	0
Total	\$1,592,000	\$1,553,000

ADDITIONAL INFORMATION

- *Brader, John S. et al., 1989. *Water Resources of the Guyandotte River Basin, West Virginia*: U.S. Geological Survey and the West Virginia Geological and Economic Survey, Reston, Virginia, 130 pp.
- Burnett, Mackenzie, and Jesse C. Craft, 1988. *A pneumatic ejection for backfilling underground mines through boreholes*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 40 pp.
- Elder, Curtis, 1988. *A manual for methane gas emission control during abandoned mine subsidence*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 46 pp.
- *Feagley, Samuel, 1988. *Minesoil sample analysis for the regulatory compliance evaluation in Louisiana*: Louisiana State University, Baton Rouge, Louisiana, 29 pp.
- *Harris, Steven C., Robert W. Hanley, Kenneth Tennesen, and Patrick E. O'Neil, 1987. *Aquatic invertebrates in the Warrior coal basin in Alabama - Bulletin 127*: Alabama Geological Survey, Tuscaloosa, Alabama, 303 pp.
- *Hassell, Wendell G., 1987. *Plant Materials Handbook*: U.S. Department of Agriculture, Soil Conservation Service, Washington, D.C., 458 pp.
- *Koppelaar, David, 1988. *Minesoil sample analysis for the regulatory compliance evaluation in Texas*: University of Texas, Austin, Texas, 32 pp.
- *Mettee, Maurice F., Patrick E. O'Neil, Malcolm J. Pierson, and Royal D. Suttkus, 1989. *Fishes of the Black Warrior River system in Alabama - Bulletin 133*: Alabama Geological Survey, Tuscaloosa, Alabama, 201 pp.
- *Myers, Jeffrey C., 1988. *A geostatistical analysis of sampling adequacy for regraded spoil sampling programs*: Estox Inc. Golden, Colorado, 34 pp.
- *Skousen, Jeff, 1988. *An evaluation of methods for determining pasture and hay production on reclaimed surface mines*: University of West Virginia, Morgantown, West Virginia, 32 pp.
- U.S. Dept. of the Interior, 1989. *A Guidance manual on subsidence control*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 125 pp.
- U.S. Dept. of the Interior, 1989. *Experimental Practices: Approval Procedures, Monitoring and Data Collection, Case Histories*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 48 pp.
- U.S. Dept. of the Interior, 1989. *Hydrologic handbook for the Federal Program for Tennessee*: Office of Surface Mining, Division of Tennessee Permitting, Knoxville, Tennessee, 64 pp.
- U.S. Dept. of the Interior, 1989. *Mine Map Repositories*: Office of Surface Mining, Washington, D.C., 8 pp.
- U.S. Dept. of the Interior, 1988. *Request for Additional Demonstrations of Experimental Practice On Direct Planting of Slurry Impoundments*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 4 pp.
- U.S. Dept. of the Interior, 1988. *Technical Assistance Program*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, (Flyer).
- U.S. Dept. of the Interior, 1989. *Technical Notes: A technology transfer medium for ideas and solutions to reclamation problems resulting from coal mining activities*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, (Flyer).
- Welsh, Robert, and Michael Robinson, 1988. *Evaluation of durability testing techniques for rock underdrain material used in Appalachian surface coal mining valley fills*: Office of Surface Mining, Eastern Field Operations, Pittsburgh, Pennsylvania, 13 pp.

* Contractor reports from research completed during 1988-1989.