
TECHNICAL ASSISTANCE

Experimental Practices

The development of new methods and techniques to improve the state-of-the-art in both the operation and the reclamation phases of surface coal mining was continued during FY 1983 through the experimental practices program. This program approves the use of new or innovative techniques and methods to determine their practicality and effectiveness for general use under appropriate field conditions.

In FY 1983, OSM approved three new experimental practices consisting of a unique approach to raptor habitat development through partial highwall retention (Seminole I Mine, Arch Mineral Corporation, Wyoming), an alternative sediment control practice to control sediment movement from lands affected by coal mining operations (Jim Bridger Mine, Bridger Coal Company, Wyoming), and the protection of the hydrologic balance and development of valuable wetlands habitat through the revegetation of acid and toxic materials (Ayrshire Mine, Amax Coal Co., Evansville, Indiana).

OSM has implemented a graduate student environmental monitoring program for approved experimental practices. Through this program OSM will provide support of a graduate student for 1 year, the equivalent of a one-half time assistantship, in return for monthly monitoring services. The scope of the monitoring program, a regulatory requirement, is developed jointly between OSM and the coal mine operator, thus reducing the workload on the operator.

Otter Creek Wilderness Area

OSM conducted an exploratory drilling, coal evaluation, and alternative mining study in response to a valid existing rights (VER) petition, to assess the mining potential within the Otter Creek wilderness area in West Virginia. To preserve the wild and scenic value and fragile nature of the wilderness area, the drilling equipment was kept to the smallest unit possible and air lifted into and out of the drilling sites. The results of this study will be used in the decision-making process for mining rights in this area.

Mine Fire Assessment

Under a cooperative agreement with Pennsylvania, OSM conducted an assessment borehole drilling and diagnostic monitoring project at the Centralia mine fire. The mine fire started in 1962 and continues to burn and spread in spite of previous attempts to control the fire through the use of barriers. Under this project 189 boreholes were drilled over a 6-month period within a 300-acre area both in and around the Borough of Centralia and the town of Byrnesville.

The results of the project delineated the mine fire areas, established the subsurface elevations with critical temperatures, defined the various thermal boundaries, and provided diagnostic monitoring of the borehole temperatures and gases.

Regional Subsidence Studies

Many urban areas overlie heavily mined regions and are facing continuing or potential problems from the effects of subsidence. In several of these locations, OSM has undertaken area-wide subsidence studies to assess the degree of subsidence potential. These studies will allow the local governments and individual property owners to decide land use capabilities and to determine the types of measures that can be taken to abate existing or minimize future subsidence problems. During FY 1983, the Pleasant Hills, Pennsylvania; Shinnston, West Virginia; and Madisonville, Kentucky, field studies were completed.

OSM staff delivered technical papers and speeches and offered mini-courses at many meetings, conferences and symposia of trade and professional organizations to disseminate and exchange technical information for the benefit of State program managers, coal industry technical experts, and coal mine operators and managers.

Information Dissemination

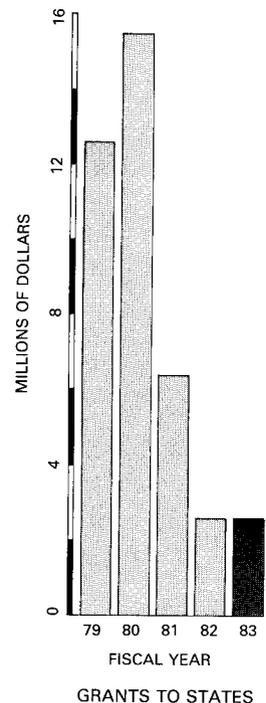
Technical assistance was provided to find solutions to problems facing the State regulatory authorities. Review of permits, interpretation of rules, training in SOAP laboratory qualification, assessment of excess spoil fill construction techniques, and provision of technical monitoring equipment are among the types of technical services rendered. Advice and counsel on subsidence, land use, revegetation success, existing structures, hydrology, soils, and other topics were also given.

The Small Operator Assistance Program (SOAP) is designed to assist small mine (less than 100,000 tons per year) operators with initial technical support. This support entails determining probable hydrologic consequences and gathering results of test boring and core samplings. These tests are performed by qualified public or private laboratories.

Small Operator Assistance Program (SOAP)

State	Administrative grants		Operational grants	
	FY 1982	¹ FY 1983	¹ FY 1982	FY 1983
Alabama.....	\$35,170	0	0	0
Illinois.....	0	0	0	\$200,000
Indiana.....	0	0	\$1,500,000	0
Kentucky.....	158,542	0	0	0
Maryland.....	0	0	0	200,000
Missouri.....	0	0	0	45,907
Ohio.....	40,135	0	0	0
Pennsylvania.....	0	0	0	1,000,000
Tennessee.....	0	0	750,000	0
Utah.....	0	0	0	60,000
Virginia.....	0	0	0	750,000
West Virginia.....	0	0	0	350,000
Wyoming.....	0	0	0	41,270
Total.....	233,847	0	2,250,000	2,647,177

¹ These grants were made from unobligated balances of prior-year obligations.



RESEARCH PROGRAM

As an adjunct to the technical assistance provided to States, mine operators, and OSM field staff, the Directorate of Technical Services and Research encourages and funds research projects and special studies. These activities provide background data, innovative approaches, and substantiation of solutions proposed in the surface mining regulations relating to reclamation requirements. The projects may provide answers to long and short term reclamation and abandoned mine problems. The research proposals are generated by universities, States, coal mine operators, and OSM headquarters or field personnel. They are of a practical nature aimed at solving current questions.

Fiscal year 1983 research expenditures amounted to \$1 million allocated to 18 projects. These projects included observance of new procedures and development of assistance measures so as to improve surface mining reclamation activities. Studies and projects for FY 1983 included—

- developed new methods for excess spoil disposal in an effort to prevent or reduce acid mine drainage and dissolved and suspended solids in the runoff,
- investigated methods to predict and reduce the hazards associated with subsidence resulting from previous and current underground mining,
- determined measurement methods for indicating when prime farmland has been returned to its full productive capacity after surface mining so as to be able to determine the amount and timing for bond release,
- evaluated existing and innovative procedures for decreasing sediment outflow from mining and reclamation operations as well as means by which sedimentation ponds themselves can be revegetated and reclaimed.

Applied Research
Projects

Project	Funding ¹			Estimated completion date
	FY 1981	FY 1982	FY 1983	
Development and revision of design manual for backfilling and grading of surface coal mine areas.....	\$76,424	0	\$8,975	Completed.
Development of environmental and design manual for disposal of excess coal mine spoil.....	79,300	0	0	Completed.
Coal waste leachate	12,856	0	0	Completed.
Effects of drill stem grease on overburden samples.....	18,620	0	0	Completed.
Collection of representative coal refuse samples for leachate generation studies ..	45,767	0	0	Completed.
Highwall stability analysis	24,192	0	0	Completed.
Hydrologic connection between surface waters and ground waters in the Carbondale Group of Indiana counties ...	25,594	0	0	Completed.
Design manual for sediment control.....	0	\$48,000	0	Completed.
State of the art in alleviating soil compaction	0	60,000	0	Jan. 1984.
Improvement of overburden analytical technology	0	165,000	0	Sept. 1984.
Subsidence damage criteria....	0	72,624	0	Jan. 1984.
Regional alluvial valley floor assessment	0	99,762	97,238	Sept. 1984.
Effect of controlled overburden placement on mine soil properties.....	0	49,120	0	Sept. 1984.

Applied Research
Projects (Cont.)

Project	Funding ¹			Estimated completion date
	FY 1981	FY 1982	FY 1983	
Monitoring an excess spoil disposal site.	0	0	\$4,992	Mar. 1984.
Analysis of surface mining performance standards to provide for coordination with regulatory controls of nationwide permitting program of the U.S. Army Corps of Engineers	0	0	4,990	Completed.
Monitoring of alternative to sedimentation pond at Jim Bridger Mine, Wyoming	0	0	7,000	Sept. 1984.
Report to describe gaps and duplication in existing regulatory process and summarize options for further development of coordinated permitting process	0	0	5,184	Completed.
Monitoring revegetation of a slurry pond site	0	0	5,000	Jan. 1984.
Monitoring a highwall retention practice	0	0	6,000	Sept. 1984.
Identification, evaluation, and demonstration of sediment control technologies	0	0	431,957	Oct. 1986.
Monitoring of mine fire extinguishing practice at Big Horn Mine, Montana	0	0	3,500	Sept. 1984.
Economic/environmental feasibility of lignite development in Mississippi ..	0	0	125,000	Sept. 1984.
Total	282,753	494,506	699,836	

¹ Funding for research projects in FY 1981 and 1982 shown only for those projects still in progress in FY 1983.

Interagency Research
Projects

Project	Cooperating agency	Funding ¹			Estimated completion date
		FY 1981	FY 1982	FY 1983	
Establishment of cooperative fish and wildlife species information system.	U.S. Fish and Wildlife Service.	\$400,000	0	0	Completed.
Sedimentation/hydrology of surface mined lands in the Appalachian Plateau area of Maryland, West Virginia and Pennsylvania.	Tennessee Valley Authority.	225,000	\$100,000	\$75,000	Dec. 1984.
Cumulative hydrologic impact information.	U.S. Geological Survey.	0	275,000	0	Completed.
Optimum moisture requirements for the establishment of natural species on topsoiled coal mine spoils in the Four Corners area of New Mexico.	U.S. Forest Service.	168,000	120,000	0	Sept. 1984.
Ground water, Georgia.	Tennessee Valley Authority.	48,000	0	0	Completed.
Effectiveness of OSM regulation in preventing ground-water contamination.	U.S. Environmental Protection Agency.	0	70,000	0	Dec. 1983.
Concepts of highwall removal and approximate original contour restoration.	National Academy of Sciences.	0	200,000	0	Apr. 1984.
Aerial photography.	Tennessee Valley Authority.	0	90,000	0	Sept. 1985.
Sampling procedures for vegetation.	State of North Dakota.	0	47,548	0	Apr. 1984.

Interagency Research
Projects (Cont.)

Project	Cooperating agency	Funding ¹			Estimated completion date
		FY 1981	FY 1982	FY 1983	
Remote sensing of AML projects.	U.S. Forest Service.	0	15,000	0	Sept. 1984.
Plant materials study to identify plants suited to coal mine reclamation.	U.S. Department of Agriculture.	0	\$92,000	0	Dec. 1984.
Committee on ground failure hazards mitigation research.	National Academy of Sciences.	0	0	\$10,000	Jan. 1984.
Core support program.	National Academy of Sciences.	\$55,000	55,000	55,000	June 1984.
Prime farmland special study—soil survey vs. crop production as a measure of soil productivity for bond release.	University of Illinois.	0	0	130,033	Oct. 1984.
Support for national wetlands assessment workshop.	U.S. Fish and Wildlife Service.	0	0	10,000	Completed.
Technical annotated bibliography of data sources for use by coal operators when preparing surface coal mine permits.	Indiana State University.	0	0	9,900	Jan. 1984.
Coordination of regulatory permit process for surface mining permits and dredging permits where coal operations discharge dredge materials into waters of the U.S.	Smithsonian Institution.		0	41,307	Mar. 1984.
Total.....		896,000	1,064,548	331,240	

¹ Funding for research projects in FY 1981 and 1982 shown only for those projects still in progress in FY 1983.